



**THE INFLUENCE OF REGULATORY INTERVENTIONS ON CONSUMPTION
BEHAVIOUR OF SUGAR-SWEETENED BEVERAGES IN SOUTH AFRICA**

BY

KGOMOTSO MOSENOGI

STUDENT NUMBER: 1138028

SUPERVISOR: PROF. FANNY SARUCHERA

A research proposal submitted to the Faculty of Commerce, Law and Management,
University of the Witwatersrand, in partial fulfilment of the requirements for the degree of
Master of Management in Strategic Marketing.

JOHANNESBURG, 2024

DECLARATION

I, **Kgomotso Mosenogi**, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in Strategic Marketing at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other University.

KGOMOTSO MOSENOGI

SIGNED AT JOHANNESBURG, SOUTH AFRICA



On the 29th day of February 2024

DEDICATION

This Master's research paper is a humble dedication to the memory of my late Grandfather, Christopher Mosenogi, and late Grandmother, Tabitha Mosenogi. Their unwavering selflessness and unflinching commitment to imparting values and fostering love in the face of life's uncertainties have been an enduring source of inspiration and motivation throughout my life and academic journey. Their warm and affectionate physical presence is sorely missed, and may their loving souls continue to rest in peace.

In addition, this research paper is a tribute to the source of my unwavering motivation and perseverance as I pursued its completion - the life pulsing within me, the palpitations and gentle nudges that spurred me on, my precious baby, Neelo.

ACKNOWLEDGEMENTS

I sincerely thank my supervisor, Prof. Fanny Saruchera, for providing me with unwavering guidance and support throughout this arduous journey. His invaluable advice, guidance, and support have been instrumental in shaping this research paper. I am also deeply appreciative of all the individuals who have played a significant role in helping me throughout this journey, especially those who diligently participated in the survey.

Furthermore, I would like to extend my heartfelt appreciation to my beloved family, including my mother, Miriam Mosenogi, sister, Basetsana Mosenogi, and my caring cousins, aunts, and uncles. Their unwavering support, love, and encouragement have been priceless during this challenging period.

Lastly, and most importantly, I attribute all the glory to God for His divine grace and favour throughout my life journey.

ABSTRACT

The increasing rates of chronic diseases as a result of weight gain, which lead to increased mortality rates, are linked to consuming processed foods and are progressively becoming a growing concern in South Africa. In response, the South African government imposed a sugar tax to control the consumption of sugar-sweetened beverages (SSBs), as these beverages are associated with health issues such as diabetes and obesity. However, research on the influence of regulatory interventions, such as sugar taxes, on SSB consumption behaviour is lacking.

Through the assessment of the three marketing mix components, namely, product, price, and promotion, this study investigated the influence of various regulatory interventions on SSB consumption behaviour in South Africa. Using the Consumption Behaviour theory as a framework that acknowledges that internal and external factors can influence a purchase decision, the study explores how Product Reformulations, Product Size, Product Packaging, Price, and Promotion affect SSB consumption behaviour among South African consumers.

The exploratory study's methodology was quantitative conducted through a self-administered survey. Data was collected from 297 South African participants between the ages of 18 and 59, and the results were analysed using SPSS version 28. The results validated the hypothesis that Product Formulation Regulation, Price Regulation and Promotion Regulation significantly influenced SSB consumption behaviour. On the other hand, there was insignificant effect from Product Size Regulation. The study excluded the hypothesis on Product Packaging Regulation because of concerns about its validity.

The study enhances the existing body of knowledge and comprehension of how regulatory interventions influence consumption behaviour. Furthermore, it offers practical recommendations for consumers, policymakers, SSB manufacturers and healthcare practitioners. The enhanced understanding can impact policy decisions and public health initiatives aimed at addressing the detrimental health effects associated with high SSB intake in South Africa.

Keywords: *Consumption Behaviour, Product Reformulations, Product Size, Product Packaging, Price, Promotion, Sugar-Sweetened Beverages, Regulatory Interventions.*

TABLE OF CONTENTS

TABLE OF CONTENTS	vi
LIST OF TABLES	x
LIST OF FIGURES	xi
CHAPTER 1 - INTRODUCTION.....	1
1.1 Introduction	1
1.2 Purpose of the Study	2
1.3 Context of the Study	3
1.4 Problem Statement	6
1.5 Research Objectives.....	7
1.6 Research Questions	8
1.7 Significance of the Study	8
1.8 Delimitations of The Study.....	10
1.9 Definition of Terms.....	10
1.10 Assumptions.....	11
1.11 The structure of the report	12
1.12 Chapter Summary.....	12
CHAPTER 2 - LITERATURE REVIEW	13
2.1 Introduction.....	13
2.2 Theoretical Grounding, Definition of Topic, and Background Discussion.....	13
2.2.1 Overview and definition of the theory of Consumer Buying Decision Process and Consumer Behaviour	15
2.2.2. Relevance and application of the of the theory to the study	17
2.2.3 The Stimulus Organism Response Model of Decision Making.....	18
2.3 Regulatory Interventions	19
2.4 Marketing Mix.....	22
2.5 Product.....	23
2.5.1 Product Reformulations.....	24
2.5.2 Product Size	25
2.5.3 Product Packaging	27
2.6 Price.....	29
2.6.1 Market Factors.....	31
2.6.2 Customer Factors	32
2.6.3 Brand Factors.....	32
2.6.4 Competitor Factors.....	32
2.6.5 Prices of SSBs	33
2.7 Promotion.....	34
2.7.1 Health-Conscious Consumer	35

2.8 Literature Gaps.....	36
2.9 Theoretical Framework	37
2.10 Conceptual Framework of the Study	38
2.11 Chapter Summary	39
CHAPTER 3 – RESEARCH METHODOLOGY.....	41
3.1 Introduction.....	41
3.2 Research Paradigm	41
3.3 Research Design.....	42
3.4 Research Population and Sample Size	43
3.4.1 Population.....	43
3.4.2 Sample size and Sampling Method	43
3.5 The Research Instrument.....	45
3.6 Pilot Study.....	46
3.6.1 Pilot Study Measurement Scale	46
3.7 Procedure for Data Collection.....	48
3.8 Data Analysis Approach.....	48
3.9 Limitations of the Study.....	50
3.10 Validity and Reliability	50
3.10.1 Validity Analysis.....	51
3.10.2 Reliability	51
3.11 Ethical Considerations.....	52
CHAPTER 4 – DATA ANALYSIS AND PRESENTATION OF RESULTS	53
4.1 Introduction.....	53
1.13 Data Cleaning.....	53
4.3 Demographic Profile of Respondents.....	54
4.3.1 Age	54
4.3.2 Education level	55
4.3.3 Respondents Monthly Income	56
4.3.4 Sugar-Sweetened Behaviour Consumption Behaviour	56
4.3.5 Respondents Aware of the Sugar Tax and its Implications	57
4.4 Descriptive Statistics	57
4.4.1 Product Reformulation - Descriptive Statistics	58
4.4.2 Product Size - Descriptive Statistics.....	58
4.4.3 Product Packaging - Descriptive Statistics.....	59
4.4.4 Price - Descriptive Statistics	60
4.4.5 Promotion - Descriptive Statistics	61
4.5 Reliability and Validity Testing.....	61
4.5.1 Validity Assessment	62
4.5.2 Reliability Analysis	65
1.6 Conceptual Model Framework	65

4.7 Correlation Analysis	66
4.8 Regression Analysis	67
4.8.1 Regression results.....	67
4.9 Hypothesis Results.....	68
4.9.1 Results pertaining to Hypothesis 1 (H1)	68
4.9.2 Results pertaining to Hypothesis 2 (H2)	69
4.9.3 Results pertaining to Hypothesis 3 (H3)	69
4.9.4 Results pertaining to Hypothesis 4 (H4)	69
4.9.5 Results pertaining to Hypothesis 5 (H5)	69
4.10 Regression Assumptions Diagnostics.....	70
4.10.1 Test for Collinearity.....	70
4.10.2 Test for Normality.....	70
4.10.3 Test for Multicollinearity.....	71
4.10.4 Test for Homoscedasticity.....	71
4.10.5 Test for Independence	72
4.11 Summary of The Results	72
CHAPTER 5 – DISCUSSION OF THE RESULTS.....	74
5.1 Introduction	74
5.2 Demographic Results Discussion	74
5.3 Hypothesis Results Discussion.....	75
5.3.1 Product Reformulation Regulation – Consumption Behaviour.....	76
5.3.2 Product Size Regulation – Consumption Behaviour	77
5.3.3 Price Regulation – Consumption Behaviour	78
5.3.4 Promotion Regulation – Consumption Behaviour	79
5.4 Chapter Summary	81
CHAPTER 6 – CONCLUSIONS AND RECOMMENDATIONS.....	82
6.1 Introduction.....	82
6.2 Conclusions of the Study	82
6.3 Recommendations.....	82
6.3.1 Availability and Accessibility of Healthier Alternatives	84
6.3.2 Education and Communication Programmes – Government Intervention	85
6.3.3 Regulation of the Retail Environment and Accessibility Restrictions	86
6.3.4 Age Restrictions	87
6.3.5 Increased Investment by SSB Manufacturers in Marketing Healthier Alternatives	87
6.3.6 Greater Collaboration between the Government and Healthcare Practitioners	88
6.4 Implications	88
6.4.1 Managerial Implications	88
6.4.2 Theoretical Implications	90
6.5 Limitations and Suggestions for Future Research	90

6.5.1 Limitations of the Study.....	90
6.5.2 Suggestions for Future Research.....	91
6.6 Conclusions	91
7.0 References	93
Appendixes	108
Appendix 1: South African Population Age Breakdown	
Appendix 2: Cover Letter	
Appendix 3: Research Instrument	
Appendix 4: Pilot Study Component Matrix - Product Formulation	
Appendix 5: Pilot Study Component Matrix - Product Size – Iteration 1 to 2	
Appendix 6: Pilot Study Component Matrix - Product Packaging	
Appendix 7: Pilot Study Component Matrix – Price	
Appendix 8:– Pilot Study Component Matrix – Promotion	
Appendix 9: Results of the Pilot Study	
Appendix 10: Ethical Clearance Certificate	
Appendix 11: Language Editing Memorandum	

LIST OF TABLES

Table 1: Tax Options - Specific Rates	20
Table 2 - Product Reformulation - Descriptive Statistics	58
Table 3 - Product Size - Descriptive Statistics	59
Table 4 - Product Packaging - Descriptive Statistics	60
Table 5 - Price - Descriptive Statistics	60
Table 6 - Promotion - Descriptive Statistics	61
Table 7 - KMO and Bartlett's Test.....	62
Table 8 - Total Variance Explained	63
Table 9 - Pattern Matrix.....	64
Table 10 - Reliability of Scale	65
Table 11- Descriptive Statistics and Pearson's Correlation.....	67
Table 12 - Model Summary	67
Table 13 - ANOVA	68
Table 14 - Coefficients.....	68
Table 15 - Test for Multicollinearity.....	71
Table 16 - Hypothesis Testing Summary	76

LIST OF FIGURES

Figure 1 - Obesity Statistics in South Africa.....	4
Figure 2 - Research Flow.....	12
Figure 4 - Consumer Behaviour Model	17
Figure 5 - Stimulus-Organism-Response Model of Decision Making.....	18
Figure 6 - Health Impact Pyramid	21
Figure 7 - The Four P Components of the Marketing Mix	23
Figure 8 - Nutritional Label Examples in Practice	28
Figure 9 - Determinants of Retail Pricing Strategy.....	30
Figure 10 - Pricing objectives and pricing strategies for their achievement.....	31
Figure 11 – Behaviour Change Wheel.....	38
Figure 12 – Conceptual Framework of the Study.....	39
Figure 14 - Respondents Academic Level.....	55
Figure 15 - Respondents Monthly Income	56
Figure 16 - Favourite Sugar-Sweetened Beverage Category.....	57
Figure 17 - Respondents awareness of the Sugar Tax.....	57
Figure 18 - Scree Plot.....	64
Figure 19 - Conceptual Framework.....	66
Figure 21 - Scatter Plot of Residuals.....	71

CHAPTER 1 - INTRODUCTION

1.1 Introduction

The rise in consumer concerns regarding food safety and the globalisation of food production has led to a global and interconnected food production and distribution system, resulting in numerous public and private standards and regulations on food safety and quality (Trienekens & Zuurbier, 2008). According to Brennan and Grandison (2012), food processing includes methods to alter the taste, texture, flavour and palatability of food and can have adverse consequences on human health. Saltmarsh and Saltmarsh (2013) proclaim that nutrition and health gained prominence and popularity in the 1980s and necessitated tighter measures to ensure food quality and safety, resulting in governments enforcing protection in the form of public policies in food to regulate and prohibit the sale of unsafe foods.

Consequently, over the years, Sugar-Sweetened Beverages (SSBs) have also been affected by food policies introduced by governments and regulatory bodies. In 2014, Mexico became one of the first countries in the world to introduce a sugar tax (James, Lajous, & Reich, 2020). Piekara (2022) states that consumption of SSBs can result in health problems such as obesity, diabetes and dental decay. To decrease the risks of diseases associated with the food people consume, Veerman, Sacks, Antonopoulos, and Martin (2016) opine that the creation of healthy food environments is vital and food taxes are the favoured and effective methods of interventions used to improve population diets towards healthier foods by altering consumption patterns.

The topic of the sugar tax is starting to gain prominence, and several countries have since introduced legislative and regulatory measures to control the consumption of SSBs. By 2022, 54 countries will have introduced tax regulations on SSBs (Obesity Evidence Hub, 2022), and there is increasing interest in public health regulatory interventions to alter consumption behaviour (Hagenaars, Jeurissen, & Klazinga, 2017). The consumption of SSBs has alarmingly increased over the last few years in South Africa (Benade & Faadiel, 2017; Temple & Steyn, 2013), resulting in South Africa introducing the sugar tax in 2018 (Stacey et al., 2019).

This chapter introduces the purpose, context, problem statement and sub-problems of the study. The latter part of the chapter focuses on the study's significance, the study delimitations, the definition of terms, and the study assumptions.

1.2 Purpose of the Study

The purpose of this study was to investigate the influence of regulatory interventions on the consumption behaviour of SSBs amongst South African consumers. The focus of the study is on the Health Promotion Levy, commonly referred to as the Sugar Tax regulation introduced by the South African government. The study sought to determine whether this regulation has influenced the consumption of SSBs in South Africa.

Obesity in both adults and children is increasingly becoming a health concern in South Africa (Igumbor et al., 2012). The World Health Organisation (2021) define obesity and overweight as the excessive accumulation of fat measured by a person's weight-to-height index, known as the Body Mass Index (BMI). Adults classified as overweight have a BMI greater than 25, and those who are classified as obese have a BMI greater than 30 (World Health Organisation, 2021).

Due to globalisation, South Africa has seen drastic changes in food consumption patterns over the years towards more Western diets, which have insufficient nutrients and increase the risk of non-communicable diseases and obesity (Ronquest-Ross, Vink, & Sigge, 2015). One of the contributors to this public health challenge is the increased consumption of SSBs (Stacey et al., 2019). The study conducted by Ronquest-Ross et al. (2015) also found that the changing consumption patterns in South Africa have shifted towards increased daily kilojoules intake of SSBs, with a significant increase of 68.9% consumption of soft drinks between 1999 and 2012. In 2000, 7% of deaths in South Africa were ascribed to excess body weight or obesity, and 12% of non-communicable disease cases were directly associated with people's dietary intake (Igumbor et al., 2012; Spires et al., 2016).

The regulation of the food environment and the formulation of health policies and guidelines have largely remained rudimentary in South Africa (Igumbor et al., 2012). The South African government only convened and released a strategic plan to address the challenge of non-communicable diseases in 2011 (Spires et al., 2016). Dietary changes in South Africa necessitated the formulation of guidelines to control and alter the dietary intake of the

population. Vorster, Badham, and Venter (2013) describe Food-based dietary guidelines (FBDGs) as science-based nutritional messages that seek to alter the consumption behaviour of a particular population towards healthier diets. One of the most effective strategies for altering population food consumption patterns is through policy interventions (Spire et al., 2016; Veerman et al., 2016).

South Africa introduced the sugar tax in 2018 (Stacey et al., 2019), and studies are only starting to emerge on the impact of the regulation on consumption behaviour. Wrottesley, Stacey, Mukoma, Hofman, and Norris (2021) assert that various factors such as habit, addiction, advertising, and accessibility influence the consumption of SSBs and hamper the envisaged alterations in consumption behaviour that the government seeks to achieve. The study, therefore, focuses on assessing whether the recently introduced SSB tax has impacted and altered the consumption behaviour patterns of South Africans towards SSBs.

1.3 Context of the Study

Bosire et al. (2020) state that South Africa has an increasing obesity problem. According to Agyemang, Boatemaa, Frempong, and Aikins (2016), South Africa is amongst the top five countries in Africa which the highest prevalence of people who are overweight. The study by Owobi, Okonji, Nzoputam, and Ekholuenetale (2022) found that South Africa had the highest prevalence of obesity among women of reproductive age in Sub-Saharan Africa at 36%. World Obesity (2022) categorises South Africa's national obesity risk score out of 10 as 8/10 for adults, and Tugendhaft et al. (2016) further state that the increase in obesity levels amongst South Africans aged 15 years and above from 2012 to 2017 correlates with the increased consumption of SSBs. According to Tugendhaft et al. (2016), more females than men are obese in South Africa, as depicted in Figure 1.

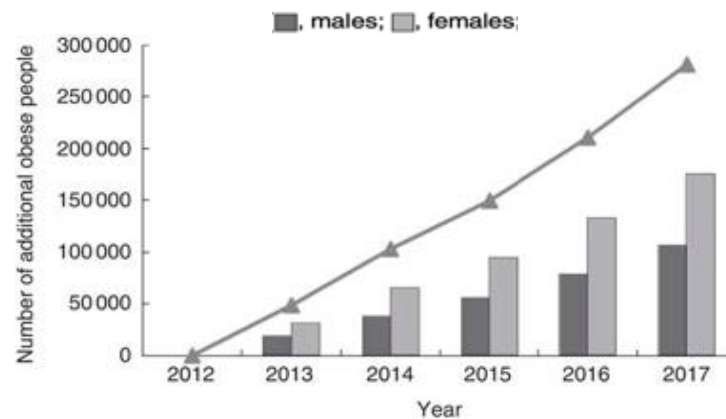


Figure 1 - Obesity Statistics in South Africa

Source - Tugendhaft et al. (2016)

The Department of National Treasury of South Africa (2016) states that fiscal interventions are critical in addressing challenges created by the overconsumption of unhealthy foods by incentivising food producers to reduce risks associated with unhealthy diets by influencing prices or the quantities consumed. The Department of National Treasury of South Africa (2016) further highlights the necessity to increase SSB prices by about 20% to reduce consumption, significantly address the obesity challenge, and ultimately, improve the population's health. This challenge resulted in the South African government introducing a Health Promotion Levy, also known as the Sugar Tax, of approximately 10% (Stacey et al., 2021), thereby becoming the first African country to introduce the sugar tax (Hofman, Stacey, Swart, Popkin, & Ng, 2021). The SSBs tax was introduced to decrease overall sugar consumption, regress the obesity scourge, and address the health challenges that arise from excessive sugar consumption amongst South Africans (Stacey et al., 2019).

The Department of National Treasury of South Africa (2016) further states that unhealthy diets mainly comprise the overconsumption of added sugars, leading to an increase in non-communicable diseases. Myers et al. (2015) suggest that South Africa is one of the major consumers of sugar, and 40% of all deaths are because of non-communicable diseases. Furthermore, non-communicable diseases are a leading cause of mortality in low and middle-income populations, which strain the public health system and reduce the country's overall productivity output due to premature deaths and disability of people during their productive years (The Department of National Treasury of South Africa, 2016).

According to The Department of National Treasury of South Africa (2016, p. 2), SSBs are "beverages that contain added caloric sweeteners such as sucrose, high-fructose corn syrup (HFCS), or fruit juice concentrates which includes but are not limited to fruit drinks, soft drinks, sports and energy drinks, vitamin water drinks, sweetened iced tea, and lemonade, among others". Many countries worldwide have used fiscal policies, such as taxation, to reduce and discourage the over consumption of SSBs, and these measures have proven to be effective when implemented well (Stacey et al., 2021).

The guidelines recommended by the World Health Organisation (2015) are for adults and children to reduce their daily sugar intake to below 10% and incrementally to below 5%, equivalent to 25 grams of the daily consumed total energy content, to realise added health benefits. This recommendation necessitates legislative interventions designed to influence consumption behaviours by nudging consumers to restrain, reduce or modify the consumption of a particular product. Marteau, Oliver, and Ashcroft (2008) describe nudging as instances where the chances of people acting in a particular way are increased, whereas shoving is seen as coercion, where the probability of people acting in the way the nudge initiator intends is increased.

The Department of National Treasury of South Africa (2016) asserts that government regulatory interventions can be affected in three ways: the actual regulation as it relates to the product or service (product), pricing instruments (price) and strategies for disseminating information (promotion) or a combination of all three methods. According to the South African Revenue Services (2021), the Health Promotion Levy applies to and is payable by manufacturers of SSBs at a fixed rate of 2.1 cents per gram for sugar beverages that have sugar that exceeds 4 grams per 100ml; however, the first 4 grams per 100ml are levy free. The sugar tax intends to reallocate the negative costs associated with the consumption of SSBs, such as the burden of healthcare costs from the broader society to the consumers and producers of SSBs, by influencing the increase of prices (The Department of National Treasury of South Africa, 2016). Spires et al. (2016) estimate that a 20% tax on sugary drinks could reduce obesity among 200,000 adults by reducing various environmental, behavioural and structural risk factors. The model advanced by Manyema, Veerman, Tugendhaft, Labadarios, and Hofman (2016) predicted that the SSB tax has the potential to prevent about 72,000 premature deaths and over half a million health adjustments brought on by the effects of strokes.

Jepson, Harris, Platt, and Tannahill (2010) assert that most public health interventions aim to alter the health behaviour of the population by either improving the knowledge people have about a particular issue to change or influence attitudes towards healthier behaviours. However, Hagenaars et al. (2017) state that the results of these interventions may only be realised after several years. Therefore, the knowledge gap that this study will address is to assess the influence of an external behavioural influencer, regulatory interventions, on the consumption behaviour of products, in this context, SSBs.

1.4 Problem Statement

Studies that assess the effects of implementing regulatory interventions on the consumption of SSBs in South Africa are lacking (Smit, Ebrahim, Marais, Nel, & Koen, 2024). The overconsumption of SSBs has resulted in adverse effects on public health. It has prompted numerous countries to take drastic steps in reducing consumption patterns by altering individual consumption behaviour through targeted educational programmes or implementing regulatory interventions such as taxation (Zupanič, Mis, & Pravst, 2020). Additionally, Hofman et al. (2021) indicate that obesity-related non-communicable diseases such as diabetes and hypertension exacerbated the impact of COVID-19, resulting in higher mortality rates. Academic research assessing the effects of the recently introduced Health Promotion Levy on the overall consumption patterns of SSBs in South Africa is only starting to emerge. However, it is very limited. Such levies demonstrate the continued risk of sugar diabetes as a major health concern.

Kardes, Cronley, and Cline (2014) stipulate that understanding consumer behaviour is vital to influencing public policies to improve a population's health and educate and assist customers in making healthy, responsible, and informed purchase decisions. Various factors influence consumer behaviour, which informs the decisions around which products to buy and the processes followed in selecting a product or service, making it a complex area (Essman, Zimmer, Carpentier, Swart, & Taillie, 2022; Kardes et al., 2014; Madhavan & Kaliyaperumal, 2015). The study conducted by Bosire et al. (2020) in Soweto three months before the introduction of the Sugar Tax in South Africa established that although the participants frequently consumed SSBs, they were unaware of the impending introduction

of the Sugar Tax. More so, the effects of sugar-related diseases are causing a strain on the health bill of the country. The other negative effect of sugar-sweetened beverages has been their association with alcohol brands, which has caused other related health problems such as alcoholism, cancer, heart, and liver complications.

Therefore, due to the differences between the ideal situation, where the government would regulate the consumption of sugar-sweetened beverages, where consumers prioritise their health, and there is outright information regarding the effects, thus a need for this study. Basically, the government must regulate such consumption. Additionally, it is necessary to conduct more research on the legislation implementation to assess the impact on the consumption behaviour of SSBs by South African consumers. Kardes et al. (2014) state that consumer behaviour is anchored on a consumer's emotional, behavioural, and mental responses to products and marketing messages. Understanding these complexities necessitates an understanding of triggers in consumer behaviour to alter consumption patterns. Pricing strategies have been used successfully to alter consumption behaviour towards healthier foods and beverages (Gittelsohn, Trude, & Kim, 2017). However, the bulk of the studies have been conducted outside of South Africa, resulting in insufficient literature to infer the results to South Africa conclusively. The literature will focus not only on legislation but also on strategies to reduce consumption of sugar-sweetened beverages apart from legislation. This is because there seems to be insufficient academic research on the relationship between consumption behaviour and regulatory interventions, which invariably result in changes or adjustments in the marketing mix elements, creating a gap that requires further research and analysis. Therefore, the study investigates whether regulatory interventions influence the consumption behaviour of SSBs among consumers in South Africa.

1.5 Research Objectives

Grounded on the research problem, the study aimed to examine the influence of regulatory interventions on the consumption behaviour of SSBs in South Africa, and sub-objectives were developed to achieve this.

- 1) To investigate the influence of product reformulation regulation on the consumption behaviour of SSBs in South Africa.

- 2) To investigate the influence of product size regulation on the consumption behaviour of SSBs in South Africa.
- 3) To investigate the influence of product packaging regulation on the consumption behaviour of SSBs in South Africa.
- 4) To investigate the influence of price regulation on the consumption behaviour of SSBs in South Africa.
- 5) To investigate the influence of promotion regulation on the consumption behaviour of SSBs in South Africa.

1.6 Research Questions

Research questions were developed based on the research objectives. Below are the research questions as they correspond to each objective.

- 1) What is the influence of product reformulation regulation on the consumption behaviour of SSBs in South Africa?
- 2) What is the influence of product size regulation on the consumption behaviour of SSBs in South Africa?
- 3) What is the influence of product packaging regulation on the consumption behaviour of SSBs in South Africa?
- 4) What is the influence of price regulation on the consumption behaviour of SSBs in South Africa?
- 5) What is the influence of promotion regulation on the consumption behaviour of SSBs in South Africa?

1.7 Significance of the Study

Essman et al. (2022) acknowledge that studies have not adequately addressed what drives consumption behaviour changes in the SSB sector. The authors further state that prices and media campaigns sensitising consumers about the sugar tax have led to the reduction in consumption of SSBs; however, no studies have linked these constructs to the change in consumption behaviour. The SSB tax regulation was recently introduced in South Africa, and as a result, its influence on consumption behaviour is yet to be adequately researched. Stacey et al. (2021) assert that despite the availability of SSB tax policy literature in South

Africa, the literature on the impact of the Sugar Tax is only starting to surface. Gupta and Singh (2020) assert that consumers' consumption behaviour determines the success or failure of implemented policies. However, there are insufficient published studies that conceptually and empirically examine the relationship between regulatory interventions and consumption behaviour, and this is primarily attributed to the newness of the SSB tax.

Furthermore, prior studies were conducted before the implementation of the SSB tax and focused on specific low-income areas within South Africa. The study of Bosire et al. (2020) focused on the youth in Soweto, a township in Johannesburg, while Essman et al. (2022) focused on Langa, a township in Cape Town. Bercholz, Ng, Stacey, and Swart (2022) found through their study that the changes in the consumption of SSBs were largely because of volume changes and consumer's switching products, followed closely by reformulations. What has emerged from the literature review is the lack of studies that assess the association between SSB consumption and awareness or knowledge of the Sugar Tax, price changes or the perceived health risks (Essman et al., 2022). There seems to be a dearth of literature that explores the constructs of product, price and promotion effects on the consumption of SSBs in South Africa across different demographics and regions.

Taking into consideration the focus of prior literature, this study contributes to the body of literature by focusing on understanding the influence of the sugar tax regulation on the consumption behaviour of consumers in South Africa by dissecting the constructs and assessing their influence on consumers' purchase behaviour. The study further guides marketers and companies, particularly those in the food and beverages industry, to consider current and future regulatory interventions and their influence on consumption behaviour.

Policymakers are constantly dealing with the effects of internationalisation, which, according to (Trienekens & Zuurbier, 2008), has changed food production, trade and distribution. As a result, policymakers must be adept with trends in food consumption, and this study will provide them with valuable insights to assist in crafting evidence-based policies that can be utilised in designing effective public policy interventions to impact public health goals positively. Furthermore, the study also aims to provide policymakers with knowledge and understanding of the factors that influence the consumption behaviour of SSBs and to identify the most effective strategies and policy interventions for changing public consumption patterns.

The study could achieve this by assessing consumption behaviour through the predictors of behaviour relevant to persuading consumption of a particular product due to public health reasons or personal health motivations, namely product reformulation, product size, product packaging, product price and promotion.

1.8 Delimitations of The Study

The research study was conducted on consumers in South Africa only and focused on consumers of SSBs only. The study was delimited to assess the influence of regulatory interventions on the consumption behaviour of SSBs in South Africa.

1.9 Definition of Terms

Cooper and Schindler (2014) specify that the precise meaning of all the words and terms used in the report and that are significant to the research must be specified. The following are definitions of the key concepts that will be used in the study.

- **Regulatory Interventions:**

Regulatory interventions in this study refer to the legislation, fiscal matters and guidelines that were introduced to alter sugar consumption in SSBs in South Africa (Michie, Atkins, & West, 2014).

- **Sugar Tax:**

A sugar tax is a fiscal measure or a Health Promotion Levy of approximately 10% introduced by the South African Government as a public health measure to reduce obesity and associated metabolic conditions (S, Kruger, & Hofman, 2020; Stacey et al., 2021).

- **Consumption Behaviour:**

Consumption behaviour is the aggregate behaviour of consumers and is the study of the selection behaviour, evaluation behaviour, acquisition behaviour, usage

behaviour, maintenance behaviour, disposition and post-disposition behaviour by all humans over time regarding marketing offerings (Gupta & Singh, 2020).

- **Consumer Behaviour:**

Consumer behaviour is at the individual level and is the actions that drive consumers to buy certain products and the factors that influence those purchase decisions (Mothersbaugh & Hawkins, 2016). The factors that influence purchase decisions can be internal or external (Ramya & Ali, 2016).

- **Sugar-Sweetened Beverages (SSBs):**

According to (Stacey et al., 2019), SSBs are non-alcoholic beverages that contain added sugar, and typical examples include carbonated sodas, juice drinks, and sports and energy drinks.

- **Carbonates:**

According to Gonzalez Viejo, Torrico, Dunshea, and Fuentes (2019), carbonated drinks use three carbonation methods to carbonate the liquid: fermentation, natural carbonation, and gas injection. Furthermore, carbon dioxide (CO₂) is a gas formed through the process of brewery fermentation (Steen & Ashurst, 2008) and is the main component in forming bubbles and foam in beverages.

1.10 Assumptions

The following assumptions in the study will be made:

- The study respondents will understand terms used in the research instrument, such as sugar-sweetened beverages, sugar tax and regulatory interventions.
- Respondents will have consumed SSBs before the introduction of the sugar tax.
- Respondents will have consumed SSBs since the introduction of the sugar tax.
- The sample size will be sufficient to confirm or oppose the hypothesis.

1.11 The structure of the report

The research report is laid out in six chapters, the contents of which are highlighted below.



Figure 2 - Research Flow

1.12 Chapter Summary

The outline and focus of the study are provided in this chapter. The chapter provides the purpose and context of the study and states the problem the study undertakes to resolve through the research questions. Despite the emergence of literature on the impact of the recently introduced sugar tax regulation on the consumption of SSBs in South Africa, there is a lack of theory and empirical evidence of the constructs that motivate this change. The study contributes to the body of knowledge and literature that assesses the impact of the sugar tax in South Africa. The report's structure is outlined in this chapter to provide an overview and format of the study.

CHAPTER 2 - LITERATURE REVIEW

The literature review chapter aims to develop theoretical knowledge and enhance understanding of the influence of regulatory interventions on the consumption behaviour of SSBs in South Africa. Conducting a literature review is a directed search of published works that discuss the theory and empirical results relevant to the identified research topic (Bosire et al., 2020; Zikmund, Babin, Carr, & Griffin, 2012). The literature review is conducted to provide a theoretical background to the study and provide context by supporting the development of clear arguments for the study (Saunders & Lewis, 2018).

2.1 Introduction

The chapter analyses existing literature from different disciplines, including marketing, socio-legal and health. The literature review was limited to articles written only in English using keywords and search terms and will be broadened to include industries other than the SSBs industry. This chapter focuses on assessing literature that is relevant to the study, commencing with the theory of Consumer Buying Decision Process and Consumer Behaviour, which this study is anchored on, followed by the review of previously published studies on the Sugar Tax and the three components of the marketing mix: Product, Price, and Promotion as it relates to SSDs. The study's conceptual model is presented, as well as the hypothesis statements, followed by a summary of key learnings from the literature reviewed.

2.2 Theoretical Grounding, Definition of Topic, and Background Discussion

The research study seeks to assess and understand whether regulatory interventions influence the consumption behaviour of SSBs amongst South African consumers. This study is embedded in the theory of *Consumption Behaviour*, a concept derivative of *Consumer Behaviour*. Gupta and Singh (2020) argue that consumption behaviour and consumer behaviour concepts are primarily the same; however, a slight variation is that consumption behaviour is the aggregate behaviour of consumers while consumer behaviour is at the individual level. For this study, consumption behaviour will refer to aggregate behaviour, while consumer behaviour will refer to individual behaviour. Within this context, and as

defined by Gupta and Singh (2020), consumption behaviour is the study of the selection, acquisition and usage behaviour as well as the behaviour of evaluation by consumers over time to marketing offerings. Similarly, scholars such as Solomon, Russell-Bennett, and Previte (2012) Gabhane et al. (2023) asset that consumer behaviour has transitioned from being referred to as buyer behaviour, which centred on the engagement between consumers and brands only at the time of purchase, towards an on-going process that takes place before, during and after a purchase. Consumer behaviour analysis is essentially about assessing the process of consumer choice (Foxall, 2001). So, a theory is a formal, testable explanation of some events that includes explanations of how things relate to one another. A simpler way to think of a theory is to consider it a model of reality, a simplification that helps us better understand the logic and relationships among different factors (Rust, 2020).

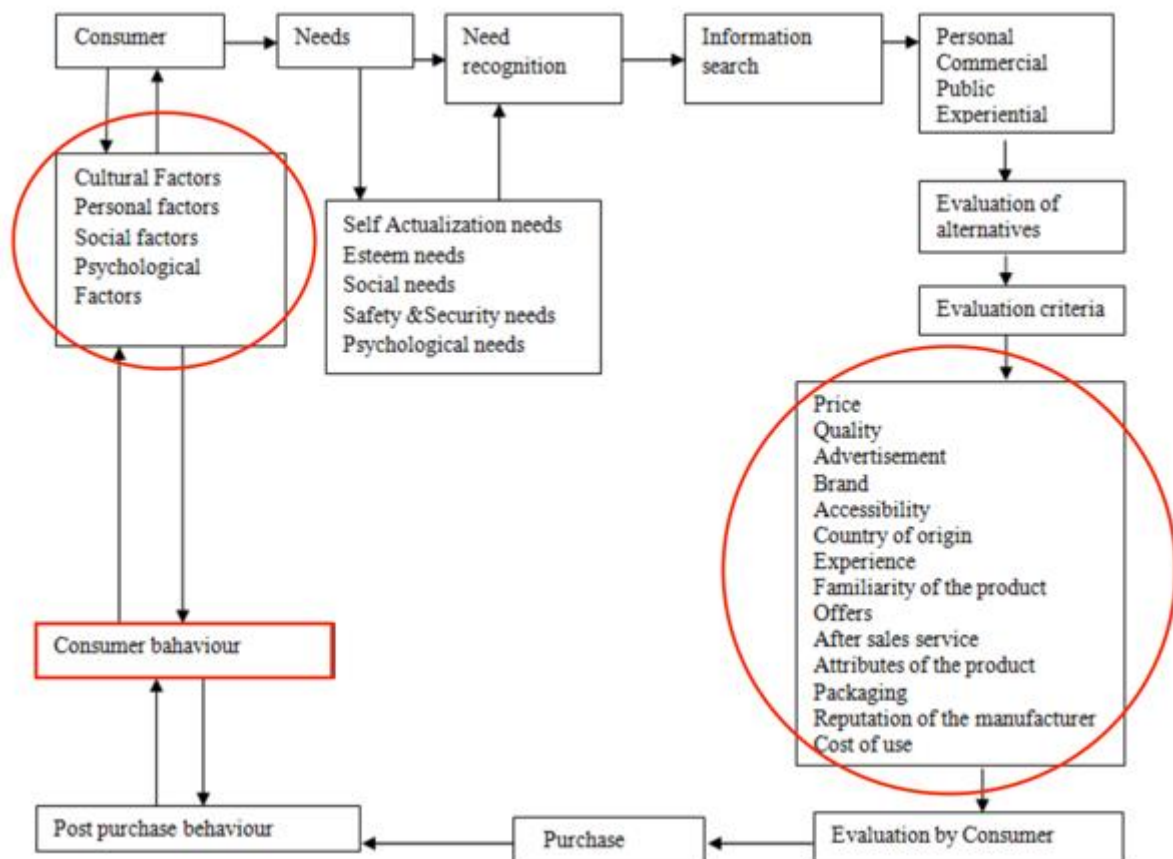


Figure 3 - Consumer Buying Decision Process and Consumer Behaviour Model

Source: (Jisana, 2014)

2.2.1 Overview and definition of the theory of Consumer Buying Decision Process and Consumer Behaviour

Developed by Engel, Blackwell, and Miniard (1995), the Consumer Buying Decision Model has been around since the 1960s and has been revised numerous times by various scholars (Bray, 2008; Erasmus, Boshoff, & Rousseau, 2001; Jacoby, 2002). Consumer behaviour is a series of actions that consumers undertake before and after acquiring and disposing of products or services (Engel et al., 1995). The model classifies consumer behaviour as a decision process that consumers undertake to acquire products or services that will resolve an identified need (Jisana, 2014). The consumer buying decision process starts with the customer identifying a need or a problem that needs resolving, then searching for information that will resolve the identified need, which could lead to a comparison of various alternatives, followed by a purchase decision and post-purchase evaluation behaviour (Bray, 2008; Jisana, 2014; Munthiu, 2009).

Consumer behaviour has been an area of interest for many researchers (Blundell, 1988; Bray, 2008; Erasmus et al., 2001; Foxall, 2001; Munthiu, 2009) and evolved over the years from being referred to as *buyer behaviour*, which is a process of engagement between consumers and brands at the time of purchase, to a continuous process that precedes the purchase process and takes into account post-purchase evaluations (Solomon et al., 2012). Consumer behaviour has been influenced and transformed by a myriad of factors over the last decades of the 20th century (Constantinides, 2006) and is central to the buying decision process and the influencers and motivations of that buying decision process (Jisana, 2014). Many research studies and literature have argued that consumption behaviour has evolved from just being influenced by the consumer life cycle and income levels but is now influenced by a myriad of factors, including social, economic, political, technological and personal factors such as perception, learning, self-image, attitudes and beliefs (Attanasio, 1999; Ehnrooth & Gronroos, 2013; Madhavan & Kaliyaperumal, 2015; Mothersbaugh & Hawkins, 2016). Similarly, Jisana (2014) asserts that cultural, personal, social and psychological characteristics play a crucial and influential role in the consumer purchase journey, and Munthiu (2009) affirms that motivation, learning, perception, memory, attitude and personality are psychological processes that play a part in the consumer buying decision process.

Consumer behaviour is a complex, multidimensional process influenced by diverse factors (Foxall, 2001; Jisana, 2014; Lehner, Mont, & Heiskanen, 2016; Mothersbaugh & Hawkins, 2016). The evolving consumer dynamics, which Palmatier and Sridhar (2017) define as the processes where customers' needs and desires morph over time, further emphasise how vital it is to recognise that people are different and have varying perceptions about situations, even those with adverse effects (Amalia, Mihaela, & Ionuț, 2012). Consumer buying behaviour depends on the situation, product, service and usage and contributes to the process's complexities. Munthiu (2009) defines complex buying behaviour as high customer involvement in purchase decisions where customers have to compare various brands or learn about a product or service category before making a purchase. Mothersbaugh and Hawkins (2016) reason that extended decision-making occurs when the consumer is highly involved in the purchase process because lower levels of purchase involvement require limited decision-making. In high-involvement purchases, the learning process accounts for consumers needing to develop beliefs and attitudes about the product before making the purchase decision (Munthiu, 2009). Ehrnrooth and Gronroos (2013) acknowledge that consumption has evolved from only fulfilling one's needs to now being weaved into social relations, identities, perceptions, and images. Furthermore, Palmatier and Sridhar (2017) found that regular exposure to relevant information intended to impact a person's needs and preferences from institutions such as the government is one of the key drivers of customer dynamics.

Customers evaluate and narrow down purchase options by employing specific evaluation mechanisms such as the price of the product, promotional messages and product features before deciding on a product or service to buy (Jisana, 2014). In the Model for Consumer Buying Decision Process and Consumer Behaviour in figure 3, these evaluation mechanisms morph into and become consumer behaviour. Mothersbaugh and Hawkins (2016) advanced the conceptual consumer behaviour model, which emphasised that various external and internal influences impact consumer behaviour. The model also highlights the extended consumer decision process, which comprises a sequence of activities commencing with problem recognition, information search, brand evaluation and selection, outlet choice and purchase, and concluding with post-purchase processes (see Figure 4). However, they recognise that consumer behaviour is hardly ever so structured or linear. Madhavan and Kaliyaperumal (2015) state that in most instances, customers do not follow the same sequence and often disregard or adjust some of the stages in more routine purchases.

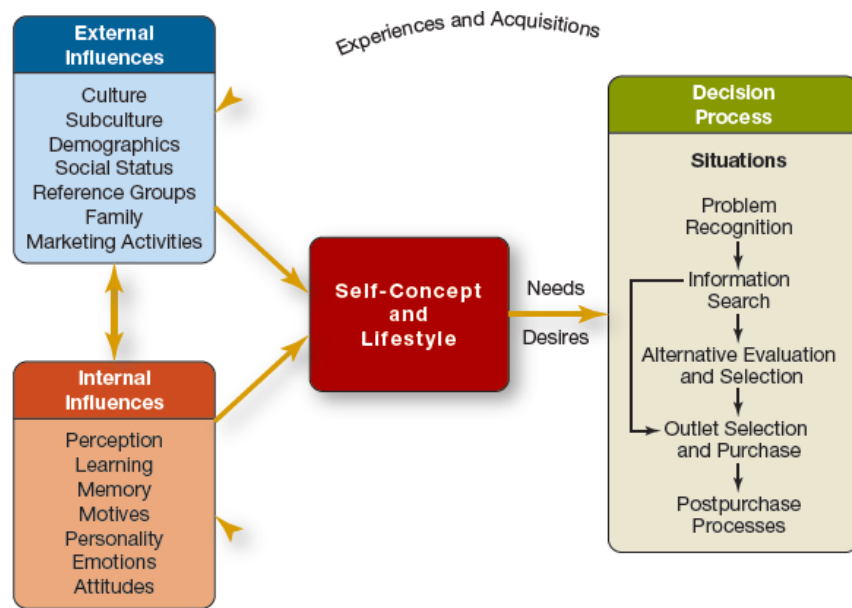


Figure 3 - Consumer Behaviour Model

Source: Mothersbaugh and Hawkins (2016)

2.2.2. Relevance and application of the of the theory to the study

This study assesses the influence of regulatory interventions on the consumption behaviour of SSBs in South Africa. The consumer buying decision process and consumer behaviour anchor themselves in this study because various scholars have asserted that consumers are not homogenous and do not follow a linear path to reach a purchasing decision. However, to understand the purchase process, the model provides a framework of steps consumers are likely to take before and after a purchase process and outlines possible influencers of purchase decisions. Stacey et al. (2021) report that in 2016, South Africa announced plans to levy a tax on SSBs, and in 2018, the Health Promotion Levy of approximately 10% was eventually implemented (Hofman et al., 2021). Stacey et al. (2019) affirmed that the introduction of taxes on SSBs was intended to decrease sugar consumption among South Africans, which had adverse effects on the population's health. Bosire et al. (2020) found that despite the introduction of the legislation, there was insufficient knowledge about the SSB tax, and there was a need to use multidimensional behaviour change strategies.

Studies conducted on the impact of the sugar tax have not assessed the influences of consumption behaviour nor sought to establish the constructs that affect consumption behaviour. Habit, addiction, accessibility and marketing messages are indicated as reasons

perceived to drive participants to consume SSB (Bosire et al., 2020; Wrottesley et al., 2021). The Consumer Buying Decision Process and Consumer Behaviour model provides the foundation to assess consumption behaviour influencers of SSBs.

Despite numerous iterations of the model over the years, regulatory interventions such as policies have yet to find a way into the frameworks and models of consumption behaviour. The overall model behaviour model advanced by Mothersbaugh and Hawkins (2016) does not recognise regulations as an external influencer of consumer behaviour; however, the model recognises self-concept and lifestyle, which refer to the lifestyle-related activities and interests of consumers and provides a basis on which to assess the consumption behaviour influences of SSBs in South Africa. Accordingly, Jacoby (2002) argues that prior models of consumer behaviour do not take into consideration future implications and situations, in the context of this study, the new influencers of consumption behaviour.

2.2.3 The Stimulus Organism Response Model of Decision Making

Over the years, various theories have been advanced by various researchers in a quest to understand consumption behaviour. One of the most prominent and widely used theories is the contemporary Stimulus Organism Response Model of decision-making (Figure 5), which recognises the influence of the environment as external stimuli such as products, prices and promotions (Jacoby, 2002). Bray (2008) categorises stimuli under contemporary cognitive psychology, where learning, perception, memory, thinking, motivation, and emotions are fundamental elements that lead to the desired response. The stimulus-response model provides a basis for understanding consumer buying behaviour (Anojan, 2015).

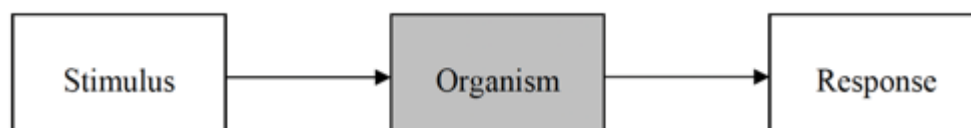


Figure 4 - Stimulus-Organism-Response Model of Decision Making

Source: (Bray, 2008)

Jones, Pykett, and Whitehead (2013) posit that long and short-term decision-making is guided by emotions, which are behavioural stimuli and can be conscious and unconscious. The authors further stipulate that when emotions are the central guide for human behaviour, consumers are likely to misread the situation or signals and will opt for short-term gains over long-term benefits. The Habits of Purchase framework advanced by East, Singh, Wright, and Vanhuele (2016) describes a habit of purchase as an occurrence where customers behave in the same manner when faced with the same stimuli. However, Mothersbaugh and Hawkins (2016) recognise that consumer behaviour can be altered as it is essentially a learned behaviour where people acquire most of their attitudes, values, and behaviours. Papasolomou (2023) emphasises that social and situational factors are environmental factors that may affect the behaviour of consumers.

Bray (2008) advocates for cognitivism because of its ability to analyse complex behaviours by identifying and ascertaining characteristics and elements that control and influence a purchase response, a capability other behavioural models lack. The Stimulus Organism Response Model of decision-making is relevant to the study to unpack and analyse the influences of regulatory interventions on the consumption behaviour of SSBs in South Africa by identifying the stimuli that lead to the desired response, a change in consumption behaviour.

2.3 Regulatory Interventions

Regulatory interventions to influence behaviour are nothing new. Changing people's behaviour is a vital aim for policy-makers, healthcare providers, educators, and researchers. However, it is not easy (Michie et al., 2014). According to The Department of National Treasury of South Africa (2016), one method widely recognised to curb the obesity scourge at a population level to improve diets and ultimately prevent and/or lessen the prevalence of non-communicable diseases is through fiscal measures. Following Mexico becoming the first country to introduce a sugar tax in 2014 (James et al., 2020), many other countries have followed suit, including South Africa, the UK, Portugal, India and Mauritius (Obesity Evidence Hub, 2022). Policy interventions are among the most effective strategies for improving the eating habits of a population (Spires et al., 2016). A comprehensive fiscal strategy adopted in South Africa includes introducing the sugar tax, creating an environment that encourages accessibility and availability of healthy food choices, communication and

educational programmes and monitoring and evaluation (The Department of National Treasury of South Africa, 2016). Marteau et al. (2008) argue that the adoption of interventions relies not only on their effectiveness but also on whether people accept those interventions. The authors also state that certain people may not accept regulations as they view them as unacceptable shoves. According to The Department of National Treasury of South Africa (2016), considerations are made on whether to apply the designed health-related tax to the product (price or quantity of the SSB) or the product's nutritional content (quantity of sugar – reformulation). The various tax options considered by the Government are listed in table 1 below.

Table 1: Tax Options - Specific Rates

Excise Duties	Advantages	Disadvantages
Flat levy on all SSBs. (e.g. R 2.00 per litre of SSB)	• Easy to administer • Capture all SSBs, including those with lower sugar content.	• Tax low sugar-content SSBs at the same rate as high sugar-content SSBs. • No incentive for manufacturers/consumers to decrease tax liability by shifting to lower sugar-content SSBs.
Levy is based on absolute sugar content. (e.g. R 0.02 per gram of sugar contained in SSBs)	• The closest proxy for targeted external harm • Provides incentive for manufacturers/consumers to decrease tax liability by shifting to lower sugar content SSBs	• Administratively, it is slightly more complex.
Threshold approach (e.g. R0.04 per gram of sugar above 5 grams per 100 ml of SSB)	• Provides incentive for manufacturers/consumers to decrease tax liability by shifting to lower sugar content SSBs.	• Administratively more complex. • Need to adjust the threshold over time.

Source: (The Department of National Treasury of South Africa, 2016)

The sugar tax regulation is proving to be effective in reducing the consumption of SSBs (Bosire et al., 2020; Colchero, Popkin, Rivera, & Ng, 2016; Ng, Rivera, Popkin, & Colchero, 2019; Stacey et al., 2021). Additionally, Manyema et al. (2016) proclaim that the sugar tax

can reduce premature deaths in South Africa due to the overconsumption of SSBs. Capewell and Lloyd-Williams (2018) corroborate this claim by asserting that there is increasing evidence that downstream public health strategies are less effective than upstream strategies. They define downstream strategies as those targeting individuals, which are more educational, such as personal advice to stop smoking or exercise more, while upstream strategies enforce interventions, such as smoke-free legislation and alcohol age restrictions. A similar assertion is made by Pearson et al. (2013) through the Health Impact Pyramid in Figure 4. The health impact pyramid depicts the different categories of population-wide risk reduction and health promotion efforts. The pyramid shows that socio-economic factors at the bottom of the pyramid are interventions that significantly impact the population. The impact decreases as one moves up the pyramid, where the top shows that counselling and education interventions require the most significant individual effort (Pearson et al., 2013).

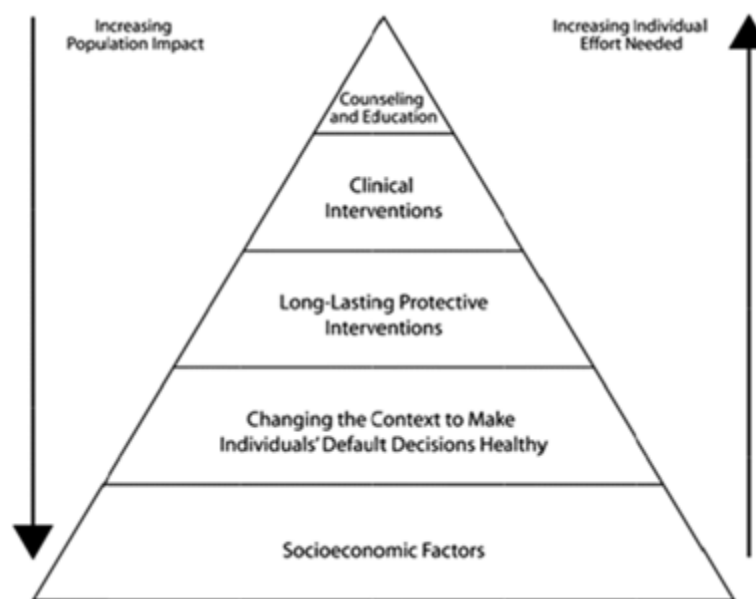


Figure 5 - Health Impact Pyramid

Source: (Pearson et al., 2013)

Different countries and nationalities consume sugar differently (Piekara, 2022). The study of Backholer et al. (2016) found that socio-economic factors determine the prevalence of obesity in a country, and people who come from disadvantaged backgrounds, with lower income and less education are likely to be obese.

Regulatory interventions that have an impact on personal choice have been successfully applied for numerous behavioural change mediation efforts, and according to Jones et al. (2013), the rising influence of psychology and related behavioural sciences has shifted public policy development. Public policies are defined as regulations, guidelines and laws that govern business practices and operations to protect consumers and the greater population from unethical and unsafe business practices (Kardes et al., 2014).

Regulatory interventions have successfully been implemented to encourage the reduction of dietary sodium consumption in processed foods (Kloss, Meyer, Graeve, & Vetter, 2015; Santos et al., 2021; Trieu et al., 2015; Webster, Dunford, Hawkes, & Neal, 2011); for tobacco laws that promote the reduction and cessation of smoking (Mohiuddin, Mooss, Hunter, Grollmes, & Cloutier, 2007; Pearson et al., 2013; Velicer, Prochaska, Rossi, & Snow, 1992); for the reduction of sugar consumption (Andreyeva, Marple, Marinello, Moore, & Powell, 2022; Stacey et al., 2021) for the reduction of excessive alcohol consumption (McMillan & Lapham, 2006; Middleton et al., 2010; Sanchez-Ramirez & Voaklander, 2018); for the control and regulation of motorists behaviour on the road such as speed limitations and the use of seatbelts (Shams et al., 2021; Zhao, Han, Meng, Ma, & Yang, 2019) and for environmental issues such as charging a price for shopping bags to control plastic litter from shopping bags (Bharadwaj, Baland, & Nepal, 2020; Dikgang & Visser, 2012). The observed effect of the regulatory intervention of the sugar tax is primarily on the marketing mix elements of product, price, promotion, and place.

2.4 Marketing Mix

One of the oldest conceptual frameworks of marketing is the marketing mix comprising of the 4Ps: Product, Price, Place and Promotion (Borden, 1964). The marketing mix can lead to a business attaining success or failing (Nuseir & Madanat, 2015). The traditional marketing mix framework (figure 7) has, over the years, been criticised and revised by numerous researchers (Bruner, 1989; Constantinides, 2006; Londhe, 2014; Rafiq & Ahmed, 1995; Van Waterschoot & Van den Bulte, 1992). The elements of the marketing mix framework are controllable by the business and are likely to influence the consumer buying process and decision-making (Kotler, 2003)

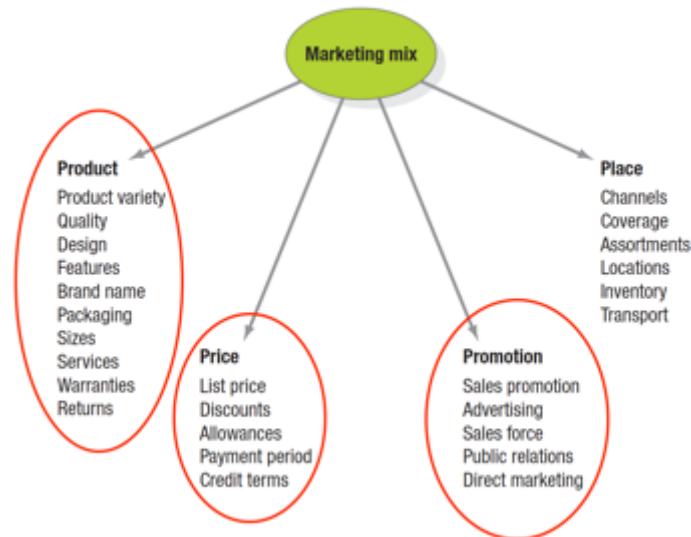


Figure 6 - The Four P Components of the Marketing Mix

Source: (Kotler & Keller, 2012)

Although the marketing mix is a useful framework, Rust and Huang (2021) proclaim that it completely ignores human factors and requires additions of new parameters to the mix to make it more useful. Nuseir and Madanat (2015) express the same sentiment by stating that effectively managing the marketing mix elements requires understanding the psychological traits that influence the customer's buying process. Similarly, Faith (2018) remarks that marketing practitioners must constantly consider behavioural forces while managing the marketing mix elements.

This study explores in greater detail and elucidates the three all-encompassing components of the marketing mix, namely, Product, Price, and Promotion, in relation to the changes implemented through the regulatory interventions in SSBs by assessing their influence on the consumption behaviour of SSBs in South Africa (Place).

2.5 Product

According to Kotler and Keller (2012), an organisation's product strategy concerns decisions around the product mix, product lines, labelling, sizing and packaging. Within the context of this study, a product is classified as an SSB, which, according to Ubeja and Patel (2014), comprises non-alcoholic sweetened beverages, concentrates and syrups used

in carbonated beverages. Euromonitor International (2022) expands the description of SSB products to include the following.

- **Carbonates:** Include sweetened non-alcoholic drinks that contain carbon dioxide, such as sparkling juices, carbonated energy drinks, bottled water, carbonated teas and cola and non-cola carbonates.
- **Concentrates:** Concentrates can either be in liquid or powder form.
- **Sports and energy drinks usually contain caffeine, guarana, ginseng, and other ingredients that** are meant to boost energy levels and physical performance (Breda et al., 2014). According to Stacey, van Walbeek, Maboshe, Tugendhaft, and Hofman (2017), energy drinks, which were recently introduced in South Africa in the nineties, contain high levels of sugar and caffeine, and their consumption is fast growing.

The most prominent SSB manufacturers in South Africa are the Coca-Cola Corporation, PepsiCo, Suntory, Red Bull and Keurig Dr Pepper (Statista, 2022). According to Research and Markets (2021), the South African soft drinks market revenue continued to grow at an annual growth rate of 3.6% from 2015 to 2019, totalling a market consumption volume increase of 4.7 billion litres in 2019. The research company attributes this growth to urbanisation and changing consumer lifestyles in South Africa. The South African forecast of the soft drink market is expected to increase on average by over 2 billion litres a year from 2022 to 2026 (Statista, 2022).

2.5.1 Product Reformulations

Product reformulations in SSBs reduce the energy and sugar content in a particular product (Crino et al., 2017), and this is one method that SSB manufacturers use to minimise their tax liability by reducing the sugar content in taxable SSBs (Hofman et al., 2021). The health promotion levy essentially incentivises the SSB manufacturers. It encourages them to reformulate their products towards reduced sugar or zero sugar versions, thereby reducing their tax liability because they are taxed based on the sugar content in a particular beverage (Boachie, Thsehla, & Hofman, 2022). Essman et al. (2022) acknowledge that the primary objective of the sugar tax is to increase the prices of SSBs, which will reduce the

consumption of SSBs and ultimately encourage manufacturers to reformulate their product offerings.

Prior studies indicate that reduced sugar decreases the consumption of SSBs in Mexico and South Africa (Colchero et al., 2016; Stacey et al., 2021). However, both these studies show that the reduction in consumption was amongst low-income consumers. The study by Hofman et al. (2021) reported that purchases of taxable beverages in urban households decreased by 29% after the implementation of the sugar tax, which was slightly less than in lower socioeconomics urban households, which saw a decrease of 32%. There is a dearth of research on the consumption behaviour change since the introduction of the sugar tax amongst affluent and urban South Africans or across different demographics. There is also limited research on various strategies that have been implemented to curb the consumption of sugar in SSBs, except for the actual reduction in the SSB. Various intended behavioural changes are reported for sodium products, such as sodium-reduced labels, limiting eating out and substituting salt with herbs and spices (Jefferson, Semnani-Azad, Wong, L'Abbé, & Arcand, 2019).

Within the South African context, the study by Essman et al. (2021) observes that the reduction in consumption of taxed SSBs is a result of behavioural change and reformulations (reduced sugar). However, the study by Bosire et al. (2020) and Essman et al. (2021) only focused on two geographical locations in South Africa: Soweto and Langa. Therefore, the study has limitations of being widely generalised to the whole South African population due to the varying socio-economic conditions in the country. Due to the contradictory and confirmatory literature discussed above, the study proposed the following hypothesis:

- ***H1: Product reformulation regulation positively and significantly influences the consumption behaviour of SSBs in South Africa.***

2.5.2 Product Size

Product size is an important external and visual feature that consumers consider when purchasing a beverage product (Siswantoro, 2019). Foods and drinks presented in large portions or packages tend to be more appealing to consumers because they often cost less in comparison to those in smaller sizes (Marteau, Hollands, Shemilt, & Jebb, 2015). The

size of a product is characterised by length, thickness, volume, width and diameter, amongst others (Siswantoro, 2019)

Cleghorn et al. (2019) proclaim that initiatives directed at portion and product size are two approaches that are heralded to reduce health challenges that emanate from the overconsumption of SSBs. Portion size reduction refers to the lessening in the quantity of the product, which is mainly achieved through a change in the package size or the reduction in the energy density per serving in an SSB, commonly referred to as reformulations (Crino et al., 2017). The scenario presented in the study by Liu, Lopez, and Zhu (2013) shows that banning 2lt bottles of SSBs forces consumers to purchase smaller containers and could potentially result in the decline of global SSB by up to 15.75%, making this scenario the most effective policy intervention to reduce the consumption of SSBs. Reducing portion sizes for a particular SSB to reduce the energy consumed is one method of regulating the sugar intake that has been widely adopted (Crino et al., 2017). Hollands et al. (2015) found that people consumed more food and drink when larger portions or packages were presented to them compared to the inverse.

Mantzari, Hollands, Pechey, Jebb, and Marteau (2017) assert that package size promotes the prevalence of overconsumption of SSBs. However, they note that there is not sufficient evidence for this claim as it relates to SSBs. Houghtaling et al. (2021) indicate that varied SSB product sizes or portions provide dual benefits for consumers, reducing sugar consumption and gradually improving their dietary energy intake, and for manufacturers, maintaining their sales and revenue while reducing costs.

The modelling study of Cleghorn et al. (2019) conducted in New Zealand found that restricting the size of a single serving of an SSB that is on sale to 250 ml is likely to result in significant cost savings and health gains, and the health savings could have a longitudinal effect on children's overall health as they grow up.

Prior studies on the effects of the sugar tax within the South African context focus mainly on pricing and reducing the sugar content in SSBs, resulting in a deficiency of literature studies that assess the effects of product sizing on consumption behaviour in SSBs because of the introduction of the sugar tax. Guided by the above literature consistencies and gaps, the study proposed the following hypothesis:

- **H2:** *Product size regulation positively and significantly influences the consumption behaviour of SSBs in South Africa.*

2.5.3 Product Packaging

According to Kotler and Keller (2012), packaging and labelling are important elements of the product strategy, and they define packaging as activities concerned with designing and producing the container for a product. Furthermore, packaging determines whether the product will fail or succeed by allowing companies to differentiate themselves from competitors (Mohebbi, 2014).

Despite the importance that packaging plays in the consumer decision-making process, there is a lack of literature that assesses this subject (Mohebbi, 2014). Literature on packaging mainly assesses the impact of graphics, colour and design of the package (Mohebbi, 2014), packaging as a brand communication tool (Nilsson & Öström, 2005), packaging as a means to improve product quality, shelf life and trackability of the product (Bradley, Castle, & Chaudhry, 2011; Marsh & Bugusu, 2007), packaging types such as glass and aluminium (Ghose & Nair, 2013) and sustainable or green packaging (Dominic, Östlund, Buffington, & Masoud, 2015; Junior, dos Reis, de Oliveira, Lopes, & Pereira, 2019).

Additionally, nutrition labels are part of the product package and depict a great deal of information about the product (Kotler, 2003). Crockett et al. (2018) define nutritional labelling as labels that provide consumers with information about the nutritional content of the food or drink item (see examples in Figure 8 below). The nutritional label depicting the nutrient content claims was made mandatory for all pre-packaged foods in the USA in 1990, followed by Europe in the same year (Crockett et al., 2018). According to Sandoval, Carpio, and Sanchez-Plata (2019), nutrient declaration/fact labels and supplementary nutrition information labels are two main types of nutritional labels for packaged foods. They state that nutrient declaration labels provide customers with nutritional information while supplementary nutrition labels help customers better interpret the nutritional information provided. One form of labelling that has gained prominence and is used by various countries is the Chilean warning method, which requires products to have a separate black sign on the front of the package to show that the content of sugar, sodium or fat exceeds the acceptable criteria (Schnettler et al., 2019).



Figure 7 - Nutritional Label Examples in Practice

Source: (Crockett et al., 2018)

Stacey et al. (2017) state that the law requires manufacturers of energy drinks to clearly and legibly place a label on the front panel of products with a caffeine concentration of >150 mg per litre that shows customers that the beverage has a high content of caffeine and that the product is not recommended for consumption by children less than 12 years of age. There is limited literature that assesses the impact of product warning labels specifically in SSBs; however, (Popova, Nonnemaker, Taylor, Bradfield, & Kim, 2019) found that warning labels in SSBs may have an impact on overall consumption by warning consumers of potential risks associated with the overconsumption of sugar. Furthermore, Schnettler et al. (2019) found that nutritional warning labels encourage customers to seek healthier alternatives, thereby encouraging choice towards reformulated alternatives.

A concept known as Front-of-pack (FOP) nutritional labelling has gained prominence in recent years and provides customers with relevant information about the nutritional composition of the product to enable them to make informed choices (Schnettler et al., 2019).

In contrast, studies on alcohol warning labels indicate that consumers pay minimal attention to them, and they have a limited influence on consumption behaviour (Kersbergen & Field, 2017; Scholes-Balog, Heerde, & Hemphill, 2012). Similarly, despite the use of graphic images and messaging, tobacco use is still rife in South Africa (Reddy, Zuma, Shisana, Jonas, & Sewpaul, 2015).

Mantzari, Vasiljevic, Turney, Pilling, and Marteau (2018) found that warning labels with images discouraged parents from purchasing SSB for their children, and labels that showed the effects of excessive sugar consumption were more effective than those that only depicted nutritional information. Fenko, Nicolaas, and Galetzka (2018) discovered through their eye-tracking study that traffic light labels are attention-grabbing and force customers to pay attention to the label. Health warning labels on SSBs contributed to the overall improvement in parents' understanding of the consequences of overconsumption of sugar and resulted in the reduction of purchases of SSBs for their children (Roberto, Wong, Musicus, & Hammond, 2016). Schnettler et al. (2019) state that warnings or labels can assist customers in being mindful and selecting healthier products.

South Africa has yet to introduce a labelling system (Bopape et al., 2021), and there are currently no specific restrictions on what manufacturers can depict on the labels, which allows manufacturers to obscure warnings from buyers in the labelling (Stacey et al., 2017). The Department of National Treasury of South Africa (2016) states it is not mandatory to display minimum nutritional information on labels of food or beverage products that do not make any nutritional or dietary claims according to the Foodstuffs, Cosmetics and Disinfectants Act. There is limited research on the influence of warning labels on the consumption behaviour of SSBs in South Africa. Warning labels have been found to effectively decrease the intention to purchase unhealthy foods and drinks in Brazil, Chile, France and Australia (Bopape et al., 2021); however, such studies are lacking in South Africa. Thus, the study proposed the following hypothesis:

- **H3:** *Product packaging regulation positively and significantly influences the consumption behaviour of SSBs in South Africa.*

2.6 Price

Pricing strategy refers to the process of adjusting prices (Dolgui & Proth, 2010) and can significantly affect revenue (Hinterhuber, 2008). According to Sammut-Bonnici and Channon (2014), pricing strategy refers to what a company will charge customers to acquire goods and services, and factors such as geography, price discrimination, discounts and price sensitivity affect the pricing strategy of an organisation. The objective of a pricing strategy is to determine the optimum price point that will allow a company to maximise its profit and

the number of units sold (Dolgui & Proth, 2010). There are varying pricing strategies to alter the consumption of SSBs, including taxes and price manipulations (Gittelsohn et al., 2017). Taxes on SSBs are the leading fiscal policy measures to control and reduce the consumption of unhealthy foods, such as sugar, salt and saturated fats (The Department of National Treasury of South Africa, 2016). Compared to the other marketing mix elements, price is the most flexible and allows for rapid changes and implementation (Faith, 2018).

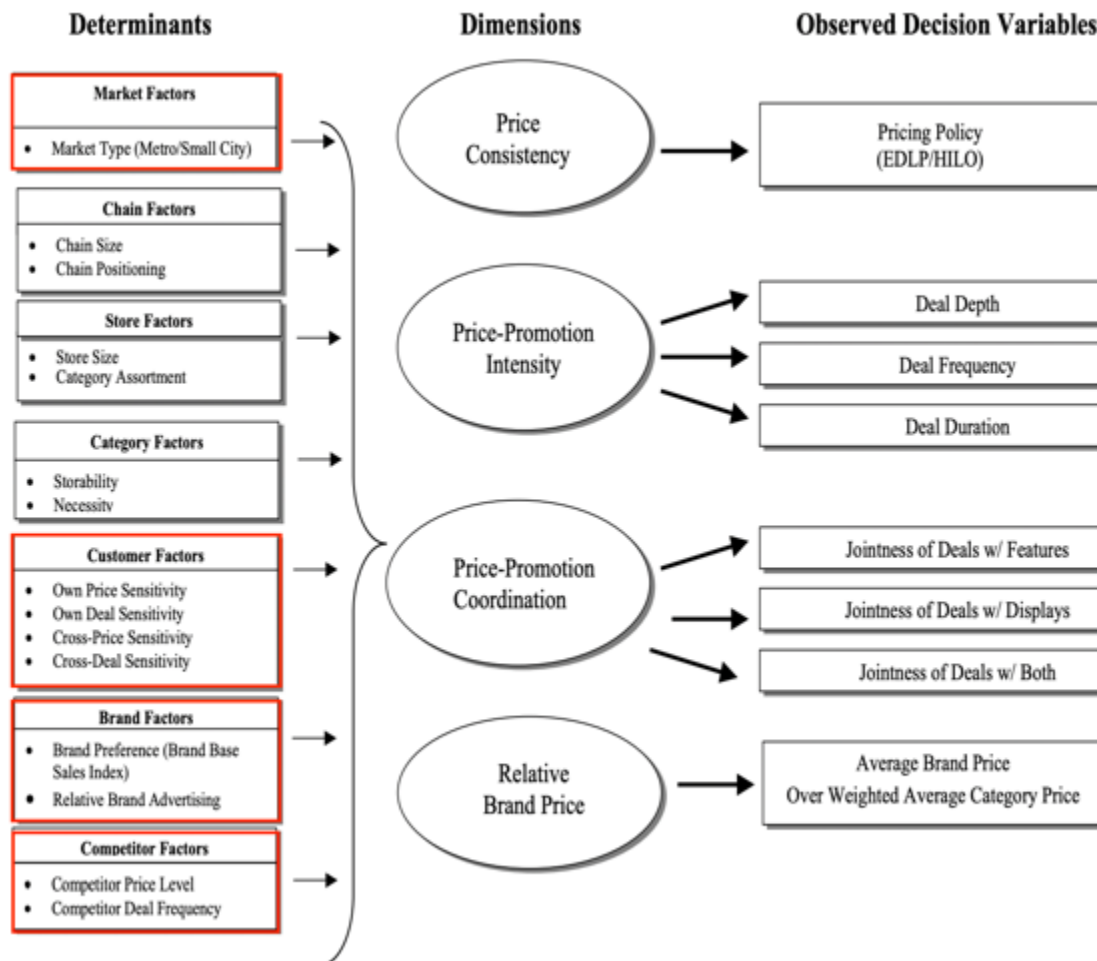


Figure 8 - Determinants of Retail Pricing Strategy

Source: (Shankar & Bolton, 2004)

Shankar and Bolton (2004) identify market factors, customer factors, brand factors and competitor factors as determinants of retail pricing, amongst others (figure 9).

2.6.1 Market Factors

Pricing strategies vary in different markets and cities, and these variations are motivated by market types, whether in metropolitan areas or small cities (Shankar & Bolton, 2004). Netseva-Porcheva and Bozev (2020) mention that avoiding government intervention and control is one of the objectives of a pricing strategy. Within the parameters of this study, price strategies as they relate to SSBs due to the introduction of the sugar tax in South Africa are subject to analysis.

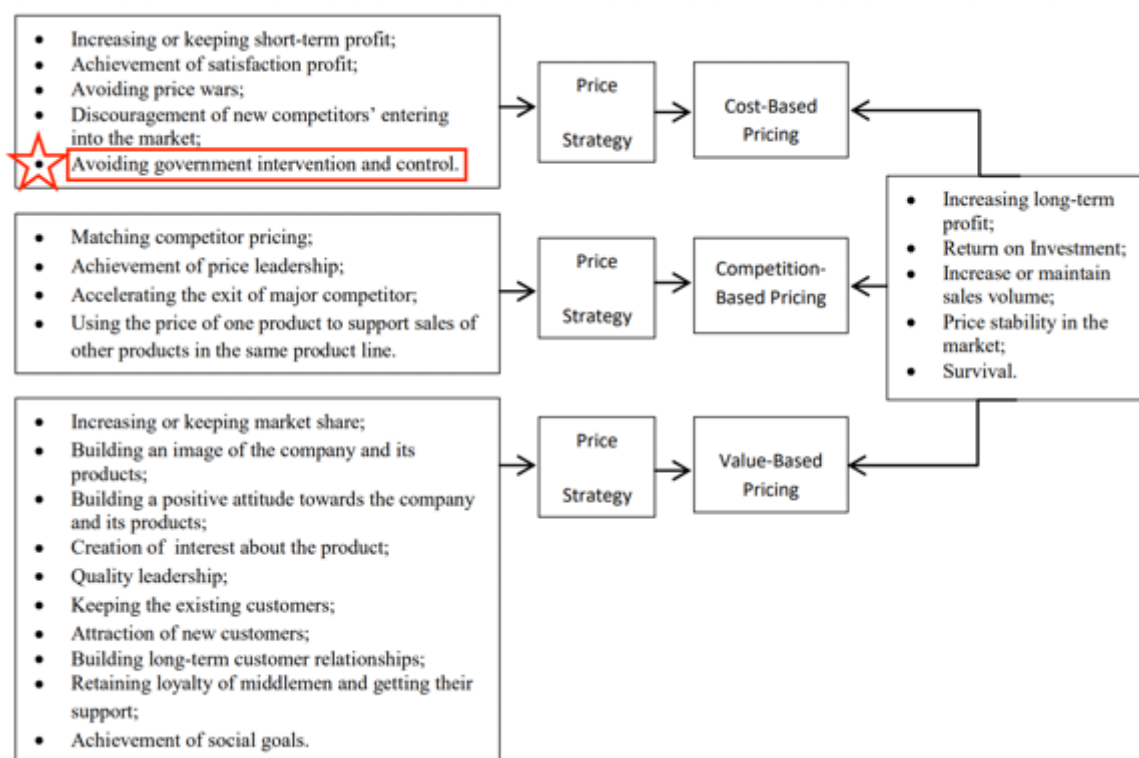


Figure 9 - Pricing objectives and pricing strategies for their achievement

Source: (Netseva-Porcheva & Bozev, 2020)

According to Netseva-Porcheva and Bozev (2020), the pricing strategy aligned with the pricing objective of avoiding government intervention and control is cost-based pricing. Numerous scholars explore cost-based pricing, and they define it as a pricing strategy that is determined to accommodate the production and marketing costs to enable the business to increase or maintain sales volumes and, ultimately, make adequate profits (Amaral & Guerreiro, 2019; Göx, 2001; Netseva-Porcheva & Bozev, 2020; Plinke, 1985; Ståhl, Windmark, & Kianian, 2018). As other markets have yet to introduce the sugar tax regulation, avoiding government intervention and control as a pricing objective for SSBs is reliant on specific market factors.

2.6.2 Customer Factors

The customer factor pricing strategy utilises customer value data to determine the selling price (Hinterhuber & Liozu, 2012) and relies on how sensitive customers are to price changes (Shankar & Bolton, 2004). Eyles, Ni Mhurchu, Nghiem, and Blakely (2012) indicate that taxable carbonated soft drinks have a price elasticity of -0.93, implying that a 1% increase in SSB prices would decrease consumption by 0.93%. Low-income consumers are more price-conscious, and thus, price plays a more crucial role in food choices for low-income consumers than high-income consumers (Steenhuis, Waterlander, & De Mul, 2011).

According to Hinterhuber (2008), existing literature acknowledges customer value-based pricing as superior to other pricing strategies. This approach, as highlighted by Hinterhuber and Liozu (2012), is directly connected to the individuals who pay for goods and services. It necessitates an understanding of what customers perceive as valuable, primarily involving the creation of products and services that address customer needs (Hinterhuber, 2008). Despite being considered superior, there is a drawback associated with relying too heavily on customer preferences and their willingness to pay (Hinterhuber & Liozu, 2012).

2.6.3 Brand Factors

Brand equity, brand advertising, and brand trade deals are three aspects of a manufacture's marketing efforts that influence retail pricing (Shankar & Bolton, 2004). Davcik and Sharma (2015) found that brand equity, product differentiation, and brand advertising greatly influence product prices. Although deals and coupons increase market penetration, they have a relatively low impact on retaining customers (Ailawadi, Lehmann, & Neslin, 2001). An effective pricing strategy for brands with different product lines is to price them differently, whereas they can opt to price all flavours in the product line the same (Draganska & Jain, 2006).

2.6.4 Competitor Factors

Competitor pricing strategy is based on research and observation of competitor price levels as well as competitor action (Hinterhuber & Liozu, 2012). This pricing strategy is responsive to competitor activities and pricing (Netseva-Porcheva & Bozev, 2020; Shankar

& Bolton, 2004). Essentially, it implies that consumers assess the value of the product through comparison with competitors' prices for a similar product (Netseva-Porcheva & Bozev, 2020).

2.6.5 Prices of SSBs

Price increases refer to the increase in taxable SSBs (Hofman et al., 2021). Stacey et al. (2021) state that these price increases in SSBs are passed on to the consumers through retail prices, resulting in an increase in the consumption cost of the largest selling SSB by volume, namely carbonates. Other scholars assert that carbonates are the largest taxed product category amongst SSBs in South Africa. For example, Roberto et al. (2019) make an association between the beverage tax and the significant price increases in supermarkets after the implementation of the sugar tax regulation, referred to as the pass-through of the tax. The sugar tax is intended to increase SSB prices with the intention of reducing consumption (Essman et al., 2022).

The study conducted by Al-Salamin and Al-Hassan (2016) showed that pricing, as one of the 4Ps of marketing, affects consumer-buying behaviour. (Colchero et al., 2016) have observed that the long-term impact of price changes will be much larger than the short-term effect. According to Marteau et al. (2015), consumers indicated that the main influence on product choice is the actual price of the product.

Many studies show that reducing the affordability of a product or increasing the price of a product deters consumption of that particular product for goods that cause harm to the health of the population (Scarborough et al., 2020; Sharma, Sinha, & Vandenberg, 2017; Silver et al., 2017; Stacey et al., 2021). Essman et al. (2022) assert that the objective of the sugar tax is to increase prices and ultimately reduce purchases and consumption of SSBs. Essman et al. (2021) observe that prices of SSBs increased while those of non-taxable beverages remained relatively the same. Based on the literature observed, it is therefore conclusive that the consumption reduction is attributable to the rising costs of the products as opposed to the reduction in sugar content (reformulation).

The study by Block, Chandra, McManus, and Willett (2010) showed that with a price increase of \$0.45, the sales of regular soft drinks declined by 26%, similar to the results of population-level behavioural interventions such as those of cigarette smoking. Afshin et al.

(2017) assessed numerous studies in the United States of America (USA) among adults and children, which all showed that a 10% increase in price decreased the consumption of unhealthy food or beverages by 6%. The research by Statista (2022) demonstrates that the prices of carbonated soft drinks, energy and sports drinks and non-carbonated soft drinks have steadily increased in South Africa from a dip in 2020 and are expected to increase annually until 2026.

Notwithstanding the results of prior research on the impact of price increases on consumption behaviour, the results of the study conducted by Wrottesley et al. (2021) and Bosire et al. (2020) identify habit, addiction, accessibility and advertising as factors that encouraged participants to purchase and consume SSBs despite the changes in prices. There is hardly any consensus in the literature about the success of pricing strategies in changing consumption behaviour, and there is no demonstration of how pricing strategies function together with health behaviour interventions to alter consumption behaviour (Gittelsohn et al., 2017). Despite this, literature that focuses on assessing the impact and influence of price change on the consumption behaviour of SSBs is starting to emerge, but there are insufficient studies and literature in South Africa. Therefore, based on the discussed literature and contradictory outcomes, the study proposed the following hypothesis:

- **H4:** *Price regulation positively and significantly influences the consumption behaviour of SSBs in South Africa.*

2.7 Promotion

Khan (2014) defines promotion in the marketing mix as the marketing communication elements, such as advertising, personal selling, public relations, and sponsorships. The modern definition of promotion encompasses e-commerce elements such as online advertisements and outbound emails (Bin Abdul Lasi & Salim, 2020). Essentially, it is the way companies communicate product offerings to customers. Advertising can change customers' beliefs about certain products and services (Nuseir & Madanat, 2015). Media campaigns have successfully been used to promote behavioural changes in family planning and control of infectious diseases (Murukutla et al., 2020). Stacey et al. (2017) reiterate this notion by stating that companies can alter consumer preferences for food and beverage through strategic advertising strategies. The results of a mass media campaign in South

Africa to Promote a Sugary Drinks Tax by Murukutla et al. (2020) demonstrate that mass media campaigns are essential to improve consumers' product knowledge, shift attitudes towards healthier alternatives and can support government strategies for reducing the consumption of SSBs. According to Murukutla et al. (2020), there is a significant body of evidence that demonstrates that mass communication campaigns are critical for the success of advancing public health intervention efforts.

Despite success in utilising mass media to alter consumers' behaviour, much effort still needs to be employed to attain the objectives of the sugar tax. Essman et al. (2022) observed that after the sugar tax was implemented in South Africa, knowledge about the risks of overconsumption of sugar slightly increased; however, the awareness of the introduced sugar tax remained low. Stacey et al. (2017) note that the South African government has not been proactive in regulating marketing messages to enforce knowledge sharing about the risks associated with sugar consumption. Furthermore, there has been a steady increase in the advertising expenditure of energy drinks, both in above-the-line and traditional media outlets in South Africa (Stacey et al., 2017).

2.7.1 Health-Conscious Consumer

Health-conscious consumers are those who understand the relationship between food properties and health and the impact of what we eat on our health (Grunert, 2017). Mass media campaigns have contributed to the increase in the knowledge base and have assisted policymakers in altering consumers' attitudes and making them more concerned about their health (Murukutla et al., 2020). This has resulted in an emerging influencer of consumption behaviour, the trend of the health-conscious consumer. Grunert (2017) argues that consumers must first know what constitutes healthy eating to guide them to choose healthy products. The rapid increase in non-communicable diseases has rapidly influenced the change in diets in South Africa (Stacey et al., 2017). The knowledge of nutritional recommendations and information is relatively good in developed countries (Grunert, 2017). However, according to the study conducted by Bosire et al. (2020), the same cannot be inferred to emerging markets, particularly relating to the newly introduced sugar tax regulation in South Africa. According to the results of the study by Bosire et al. (2020), a lot more people were still not aware of the sugar tax regulation. However, the study was conducted three months before the implementation of the regulation. The study by Anojan

(2015) found that consumers are now on a quest to find healthier and tastier alternatives when buying soft drinks.

There is limited literature on how consumers have been influenced by mass media campaigns in South Africa to alter their consumption of sugar. However, Murukutla et al. (2020) indicated that consumers recalled mass media campaigns about the dangers of sugar consumption, and as a result, about 50% of participants were more conscious of their consumption patterns and about 74% intended to reduce their sugar intake.

Health-conscious consumption is seen as an investment activity and an emerging consumer trend in building and maintaining health (Hayakawa, 2017). However, this trend can only be supported by adequate nutritional knowledge among South Africans (Bosire et al., 2020). Studies around the health-conscious consumer focus primarily on the trend and not necessarily on how the regulatory changes in SSBs have contributed to consumers being more health-conscious through knowledge acquisition in mass media. The studies do not assess the effects of whether the reduction in sales volumes of SSBs is attributable to the trend as opposed to the regulatory changes. Based on the literature discussed above, the study proposed the following hypothesis:

- ***H5: Promotion regulation positively and significantly influences the consumption behaviour of SSBs in South Africa.***

2.8 Literature Gaps

Despite this evolution in consumption behaviour influencers, there is a dearth of studies that assess regulatory interventions as an influencer of consumption behaviour, particularly within the food and beverages industry. This deficiency of academic research on regulatory interventions as an influencer of consumption behaviour has created a gap that necessitates further research.

According to the conceptual consumer behaviour model, external and internal influences impact consumer behaviour (Mothersbaugh & Hawkins, 2016). The model depicts the structure of consumer behaviour and the process or flow consumers generally follow in the purchase process (Figure 4). The model, however, omits regulatory interventions as an external influencer of consumption behaviour. The legislation changes covered by the

model only focus on regulating marketing activities, such as advertising to children, and do not consider regulations to be an external influence on consumption behaviour. Regulatory interventions within the food and beverage industries are introduced to alter the consumption behaviour towards a particular product due to the health risks associated with the consumption of such a product. In tandem, regulations allow customers to make informed purchase decisions by being fully aware of the risks associated with consuming that product.

Additionally, due to the sugar tax being new in South Africa, its impact and influence on consumer consumption behaviour have not been well researched. Stacey et al. (2021) assert that despite the extensive availability of literature about SSB tax in South Africa, there is limited literature on the impact of the regulation; however, they further state that such literature is starting to surface. Moreover, most of the studies conducted on the effects of the sugar tax regulations have been conducted abroad, and the results cannot be strictly applied to the South African context due to different timeframes of the implementation of the regulation and the different socio-economic factors that are prevalent in emerging and developed markets.

New studies indicate that sugar consumption in SSBs has decreased (Hofman et al., 2021; Stacey et al., 2021). However, these studies focus on sales volumes and do not test the relationship between regulatory intervention and consumption behaviour as a result of product reformulations, product pricing, and customers being more health-conscious.

2.9 Theoretical Framework

This study hinges on the Behaviour Change Wheel, a conceptual model developed by Michie et al. (2014) that incorporates 19 behaviour change frameworks that are not comprehensive and do not consider the influence of regulatory intervention on behaviour change. The Behaviour Change Wheel model was developed following the authors' extensive experience developing and evaluating behaviour change in many disciplines, such as road safety and infection control (Michie et al., 2014).

The Behaviour Change Wheel (see Figure 11) provides a methodical way of distinguishing interventions in a manner that allows the outcomes to be linked to the predicted action, which assists in establishing why an intervention may fail or succeed (Michie et al., 2014)

and was developed for situations where behaviour change interventions are introduced. On the outer layer, the model highlights seven policy categories that can intervene in consumption behaviour. The middle section highlights nine interventions that can be used to change behaviour, while the centre of the wheel highlights behaviour that can be targeted for intervention.

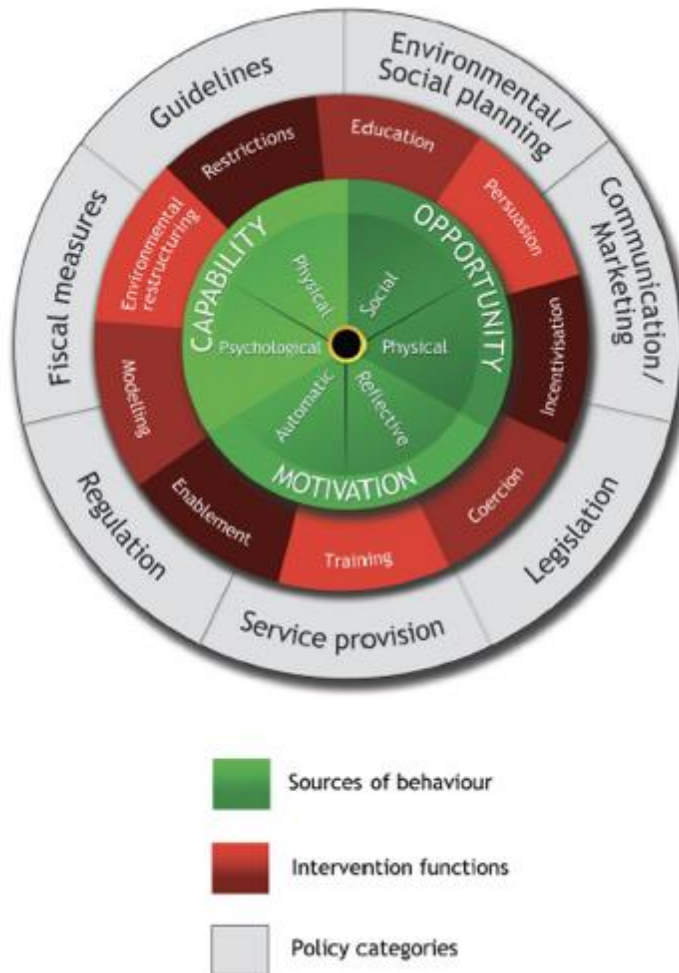


Figure 10 – Behaviour Change Wheel

Source – (Michie et al., 2014)

2.10 Conceptual Framework of the Study

The conceptual framework adopts certain elements from the Behaviour Change Wheel model. The policy categories, as depicted in Figure 11, that are relevant to this study are regulation, fiscal matters, guidelines, and legislation, and for this study, all will be labelled as regulatory interventions. This study comprises three moderating variables, defined by

Cooper and Schindler (2014) as independent variables that have a significant impact on the independent and dependent variables. The moderating variables for the study are as follows.

- Product (Independent Variable)
 - ⇒ Moderating variables – Product reformulations, product size and product packaging

The conceptual framework (Figure 12) assesses the predictors of behaviour: product (reformulations, size, and packaging), pricing, and promotion as predictors of consumption behaviour against the outcome, which is consumption behaviour. The conceptual framework seeks to test the study hypotheses and assess their influence on the dependent variable.

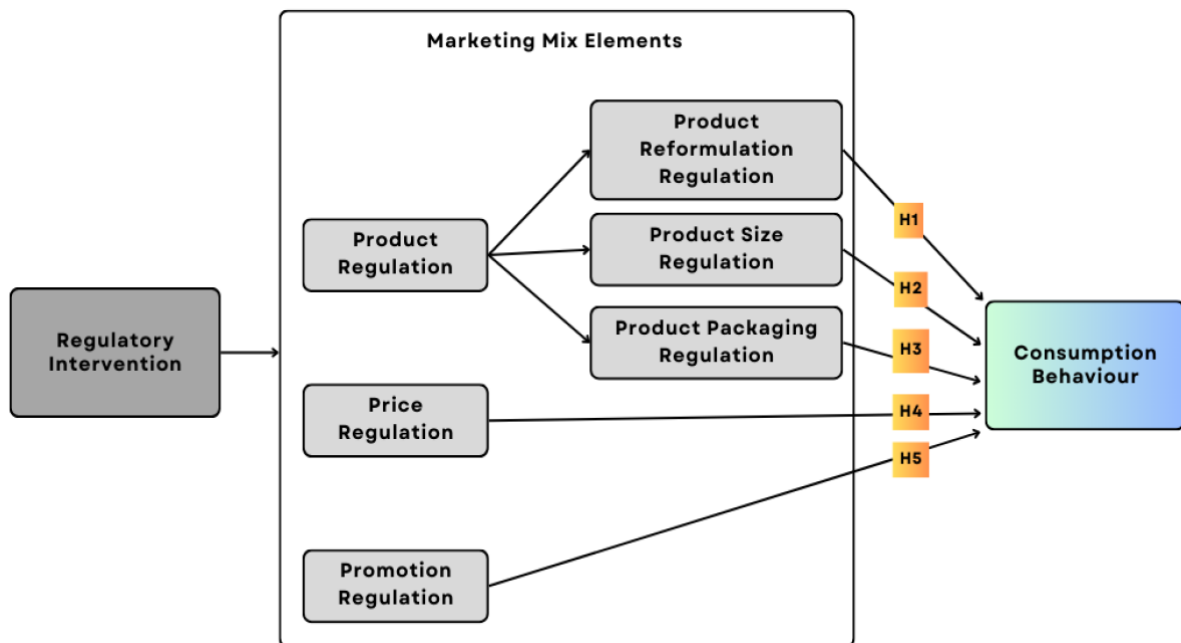


Figure 11 – Conceptual Framework of the Study

2.11 Chapter Summary

Consumption behaviour and consumer behaviour are well-researched concepts. Lehner et al. (2016) Over the years, proponents have argued that behavioural sciences, such as nudging, have systematically assisted policymakers in implementing policy changes across various fields. Baker, Gill, Friel, Carey, and Kay (2017) state that regulatory interventions are crucial public health interventions.

This chapter evaluated the literature on the influence of regulatory interventions on the consumption behaviour of SSBs. It analysed the collective factors that constitute regulatory interventions within the context of the study: product (reformulations, size and packaging), pricing, and promotion (health-conscious consumer) as predictors of consumption behaviour. The chapter also discussed the framework of this study, the Behaviour Change Wheel and concluded with the formulation of a conceptual framework.

CHAPTER 3 – RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research methodology used in the study by detailing the research paradigm, the research design, the study population, and the study sample. The chapter also discusses the research instrument used to collect data, the procedure followed, and how data will be analysed and interpreted. Lastly, the chapter addresses the study's limitations, validity and reliability, and ethical considerations.

The selection of a research approach is based on the nature of the research objectives, the research problem, and the audience for the study (Schindler, 2019). The research methodology chapter describes the research design and methodology the study will employ to collect the data and how the data will be analysed.

3.2 Research Paradigm

A research paradigm is a perspective or shared belief adopted by the researcher to interpret the research data and derive meaning from it (Kivunja & Kuyini, 2017). The study follows a positivist approach, which, according to Saunders and Lewis (2018), is a research philosophy rooted in natural sciences and will employ repeatable, structured methods that allow for generalisation. Kivunja and Kuyini (2017) expand the meaning by stating that positivism is essential in assessing the cause-and-effect relationships in nature through experimentation and observations to understand human behaviour better. The study was aimed at assessing the influence of regulatory interventions on the consumption behaviour of SSBs in South Africa.

Additionally, the study utilised a deductive research approach, aiming to test the proposed hypotheses by employing a specifically designed research strategy to collect data. According to Khaldi (2017), deductive reasoning follows logical reasoning to reach a specific conclusion by first assessing existing theory or literature before deciding on a hypothesis to put forward, gathering data to test the hypothesis and lastly, accepting or rejecting the hypothesis based on the data analysed. The research findings will guide the conclusion of the study.

3.3 Research Design

Research design is primarily concerned with selecting methods of collecting data, sampling plans, data analysis, and interpretation of the study results (Cooper & Schindler, 2014). The study is non- experimental, defined by Khaldi (2017) as a study where the researcher does not manipulate the data and excludes him/herself from the study. The cross-sectional research design is appropriate for this study, which, according to Saunders and Lewis (2018, p. 130), is a research design where a researcher would “collect data from participants at only one period in time in what is often termed a ‘snapshot’. Additionally, because the study adopted the quantitative approach, cross-sectional research was appropriate. Data is typically collected from multiple groups or types of people in cross-sectional research. Therefore, the researcher utilised a cross-sectional survey. A self-administered questionnaire was electronically distributed to address the desired themes as guided by the proposed hypotheses.

There are three research approaches, namely qualitative, quantitative, and mixed methods (Creswell, 2014). Cross-sectional studies typically use a survey strategy by utilising a questionnaire to collect quantitative data (Saunders & Lewis, 2018). Quantitative research designs are appropriate to test larger sample sizes (Schindler, 2019) and are relevant for natural sciences studies (Khaldi, 2017). Schindler (2019) states that quantitative research methods give evidence to the research questions by describing data to build theory. Quantitative research reviews available literature to formulate research questions and give direction for the research hypothesis (Creswell, 2014).

This study is deductive, explained by Saunders and Lewis (2018) as an approach that tests theoretical propositions through data collection to test the hypothesis. In deductive research, the researcher tests and verifies the theory instead of developing it by advancing the theory prior to collecting data to confirm or contradict the results (Creswell, 2014). Additionally, collecting descriptive statistics allows researchers to accurately represent the events or situations that seek to either affirm or dispute the hypothesis (Saunders & Lewis, 2018). Descriptive research allows for the collection of data on present conditions, situations and events (Khaldi, 2017).

3.4 Research Population and Sample Size

Zikmund et al. (2012) describe a research population as the entire group of entities with common characteristics identified first in the sampling process. Following this, a sample, which is a subset of the larger population, is selected. Sampling design is about deciding whom the research data needs to be collected from (Schindler, 2019). Marczyk, DeMatteo, and Festinger (2010) define a sample as a representative subgroup of the population the researcher is interested in studying.

3.4.1 Population

The population of this study comprised consumers of SSBs in South Africa. The study will exclude respondents who had started consuming SSBs only after the implementation of the Sugar Tax but will include respondents who consumed SSBs before and after the legislation was introduced. Statistics South Africa (2019) indicates that 27.1% (15.9 million) of South Africans are adults (35 to 59 years), and 35.1% (20.6 million) are youth (15 to 34 years) (Appendix 1). However, for the youth category, the study will focus on those between the ages of 18 and 34. South African Government (2005) classifies anyone above the age of 18 as an adult. According to Statistics South Africa (2019), South African youth (aged 18–34) constitute approximately a third of the population, which is 17.84 million people.

The research population for this study was simplified, as shown below.

- **Age:** Youth and adults, i.e., 18 years to 59 years.
- **Target Population:** 33.74 million, which is the total number of youth and adults aged between 18 to 59 years.
- **Geographic:** Respondents who will be residing in South Africa during the duration of the study. The study will randomly assess respondents from various provinces in South Africa.

3.4.2 Sample size and Sampling Method

For this study, a non-probability sampling technique was adopted. The study assessed consumers of SSBs in South Africa. According to Saunders and Lewis (2018), in instances

where the researcher does not have a complete list of the population, non-probability sampling techniques are employed. Etikan, Alkassim, and Abubakar (2016) state that the basis of non-probability sampling in research is accessibility.

Saunders and Lewis (2018) assert that the snowball sampling method is a non-probability sampling where sample members are identified among their acquaintances. It is often used in situations where the population of interest is difficult to access or locate. It is particularly suitable for instances where it is difficult for the researcher to compile a list of the population (Etikan et al., 2016; Mweshi & Sakyi, 2020). Similarly, Etikan and Bala (2017) assert that snowball sampling is relevant for instances where a researcher does not know much about the subjects of the study and will contact a few individuals who will refer other individuals. This sampling technique was appropriate for the study as it was difficult to identify consumers of SSBs before the introduction of the sugar tax and after its implementation who are aged between 18 and 59 years of age. Although snowball sampling is useful for research where the units to include in the sample are not easily identifiable in the population, it is difficult to make statistical generalisations or inferences from the sample to the population (Sharma, 2017).

Due to the above-mentioned challenges, the selection of some respondents in the study relied on referrals, and the respondents were expected also to recruit participants. With snowball sampling, the researcher was able to ensure that the chain of referrals adhered to the confines and the limitations of the study (Etikan et al., 2016).

Cooper and Schindler (2014) define a sample frame as components within a population where the actual sample for the study will be derived. The research sample size was comprised of individuals aged between 18 and 59 years who resided in South Africa. Given the vast size of the South African population, exceeding 60 million (Stats SA, 2023), selecting a manageable sample size was crucial. To determine this, Rao-software was employed, indicating that a sample of 385 individuals would be suitable at a 95% confidence level. However, adhering to methodological considerations and guided by the desirability table proposed by Gill, Johnson, and Clark (2010), the study opted for a sample size of 300. This table allows researchers flexibility in selecting sample sizes, recommending 50% of the population but permitting deviations based on research needs. Hence, the chosen sample size of 300 was deemed appropriate for the study.

3.5 The Research Instrument

Birmingham and Wilkinson (2003) classify research instruments as tools and mechanisms used by researchers to acquire all the necessary data pertaining to the research project. For descriptive or exploratory studies, questionnaires are the most preferred data collection tools (Sekaran & Bougie, 2013). This study is a cross-sectional study that used a survey strategy by utilising a questionnaire to collect quantitative data (Saunders & Lewis, 2018). According to Wagner, Kawulich, and Garner (2012), a structured survey asks all respondents the same questions in the exact precise wording. Marczyk et al. (2010) expound that studies that utilise surveys ask many respondents questions that seek to assess their attitudes, behaviours and opinions.

For this study, a web-based questionnaire with closed-format questions was used to collect data from the respondents. This descriptive study sought to test the relationship between the theoretical constructs that are explained in Chapter 2. The study questionnaire used a seven-point Likert measurement scale ordered from (1) strongly disagree to (7) strongly agree (see Appendix 2) to measure the influence of regulatory interventions on the consumption behaviour of SSBs in South Africa.

Section A of the questionnaire asked respondents two qualifier questions to assess whether they are currently consumers of SSBs and whether they consumed SSBs prior to 2016. The study terminated and barred respondents from proceeding if they were not consumers of SSBs prior to 2016 and are not currently consumers of SSBs.

Section B gathered general information about the participants, such as their demographics. Section C assessed whether respondents were aware of the recently implemented sugar tax in South Africa. Section D focused on product reformulations, and Section E asked respondents questions about product sizes. In Section F, the questionnaire focused on product packaging, Section G focused on price, and lastly, Section H asked respondents questions related to the promotion aspect of SSBs.

Questionnaires ask all respondents the same standardised questions in the same order (Saunders & Lewis, 2018). Despite these shortcomings, Zikmund et al. (2012) state that surveys afford researchers an efficient and inexpensive way of assessing information about

a population. Similarly, Saunders and Lewis (2018) assert that questionnaires are a good data collection method for research that seeks to collect data from a large number of respondents about the same thing. More so, considering the costs associated with research, a questionnaire was electronically distributed, hence limiting costs. Electronic distribution also facilitated increased reach. Thus, the questionnaire was appropriate for the study.

3.6 Pilot Study

Conducting pilot studies is imperative as it helps researchers gain valuable insights prior to embarking on a full-scale study (Van Teijlingen & Hundley, 2001). A pilot study, reflective of the procedures of the main study, was conducted to identify and resolve any issues with the survey to counter any potential challenges. The pilot study conducted for this study yielded a total of 20 responses, out of which two respondents declined to participate in the survey, and five did not complete the study. Before commencing data collection, the instrument was pre-tested with feedback from 13 respondents who provided complete responses.

3.6.1 Pilot Study Measurement Scale

To evaluate the validity of the constructs, Exploratory Factor Analysis was performed during the pilot study, forcing one factor per construct to assess if all the items were loading onto the same construct. The Component Matrix for the three iterations of Product Reformulation is presented in Appendix 3.

- Three iterations were conducted for Product Reformulation. The first iteration for Product Reformulation resulted in the elimination of the item *“I have noticed changes in the taste of my favourite sugar-sweetened beverage”* as it had a factor loading less than 0.3.
- The second iteration of Exploratory Factor Analysis resulted in the reversal of scale (7=1, 6=2, 5=3, 4=4, 3=5, 2=6, 1=7) for the item *“I have noticed that there is less sugar in my favourite sugar-sweetened beverage”* as it was negatively correlated to the rest of the items in the same construct.
- The final iteration with the results had all items with a factor loading greater than 0.3; hence, it was a valid construct.

Furthermore, Cronbach's Alpha was calculated to assess the reliability of the instrument. Reliability was assessed for the items that were retained after the Exploratory Factor Analysis, and the alpha value was 0.663. The deletion of Item "*I prefer the taste of my favourite sugar-sweetened beverages before the reduction in sugar content*" would improve the Cronbach's Alpha to 0.713, although this is not significantly higher than 0.663 and considering that this was a small sample size, the item was retained in the construct. The item "*I have noticed changes in the taste of my favourite sugar-sweetened beverage*" was removed from the construct to improve its validity.

Like product reformulation, the Component Matrix for the two iterations of Product Size is presented in Appendix 4. The first iteration of Exploratory Factor Analysis resulted in the elimination of the item "*I will continue to buy my favourite sugar-sweetened beverage regardless of the changes in its size*" as it had a factor loading less than 0.3 and the reversal of scale (7=1, 6=2, 5=3, 4=4, 3=5, 2=6, 1=7) for the item "*I am getting value for money with the current package size of my favourite sugar-sweetened beverage*" as it was negatively correlated to the rest of the items. The final iteration results had all items with a factor loading greater than 0.3; hence, they were valid constructs.

Assessment of Reliability for Product Size: Cronbach's Alpha was used for the items that were retained in the Exploratory Factor Analysis, and the alpha value was 0.832; this was an acceptable reliability level. Additionally, on product packaging, the Component Matrix for Product Size is presented in Appendix 5. The Component Matrix for product packaging had all items with a factor loading greater than 0.3; hence, it is a valid construct.

Furthermore, Cronbach's alpha was calculated for the items that were retained in the exploratory factor analysis, and the alpha value was 0.561. The deletion of items like "*I read the nutritional labels of sugar-sweetened beverages before I purchase them*" and "*There are low-sugar and no-sugar alternatives information displayed on the package of my favourite drink*" would improve the Cronbach's Alpha but the sample size was small and thus, the items were retained in the construct. The Component Matrix for the two price iterations is presented in Appendix 6.

The first iteration of Exploratory Factor Analysis resulted in the reversal of scale (7=1, 6=2, 5=3, 4=4, 3=5, 2=6, 1=7) for the item "*My favourite sugar-sweetened beverages are reasonably priced*" as it was negatively correlated to the rest of the items. After the removal

of “*My favourite sugar-sweetened beverages is reasonably priced*”, the results had all items with a factor loading greater than 0.3 and all positive, hence a valid construct.

Assessment of Reliability for Price: Cronbach’s Alpha was conducted for the items that were retained in the Exploratory Factor Analysis, and the alpha value was 0.573. The deletion of the item “I will continue to buy my favourite sugar-sweetened beverage regardless of the price” would improve the Cronbach’s Alpha to 0.603, but this is not significantly higher than 0.573 and considering that this was a small sample size, the item was retained in the construct. The Component Matrix for the three iterations of Promotion are presented in Appendix 7.

- The first iteration resulted in the elimination of the item “*I go out of my way to find nutritional information about the sugar-sweetened beverages I consume*”, as it had a factor loading less than 0.3.
- The secondary iteration resulted in the elimination of the item “*There is enough information to help me make informed decisions about my diet in the media*”, as it had a factor loading less than 0.3.
- The final iteration with the results had all items with a factor loading greater than 0.3. Hence, it is a valid construct.

Assessment of Reliability for Promotion: Cronbach’s Alpha was conducted for the items that were retained in the Exploratory Factor Analysis, and the alpha value was 0.809; and this was an acceptable reliability level.

3.7 Procedure for Data Collection

Data for the study was collected through a self-administered and pre-validated questionnaire. The respondents were asked to fill out the questionnaire, which, according to Saunders and Lewis (2018), is used to collect data from a large number of respondents. The link to the questionnaire was sent to participants through Qualtrics via email and mobile phones.

3.8 Data Analysis Approach

The study collected data that is categorical and numerical. According to Saunders and Lewis (2018), categorical data is nominal (descriptive) or ordinal (ranked) and numerical data can

be presented in intervals and ratios. The research study assessed the influence of regulatory interventions (*independent variable*) on the consumption behaviour of SSBs (*dependent variable*), and the hypotheses tested several independent variables against one dependent variable. Both the independent and dependent variables for the study were non-metric. Zikmund et al. (2012) state that multivariate statistical analysis involves three or more variables accordingly. Therefore, the study utilised dependence techniques to distinguish between the independent and dependent variables in the hypothesis.

To maintain data integrity, the data collected was downloaded as an Excel sheet and loaded onto SPSS for analysis. The process of coding data refers to giving each variable a distinct name, recorded as a data matrix for easy computing (Saunders & Lewis, 2018), while editing data encompasses examining data to assess if data is complete, consistent and legible prior to being transferred to a statistical analysis tool such as SPSS (Zikmund et al., 2012). Quantitative data is presented in tables and diagrams (Saunders & Lewis, 2018). The validity of the constructs was assessed through exploratory factor analysis. The Kaiser-Meyer-Olkin (KMO), a measure of sampling adequacy (Shrestha, 2021), was conducted for Factor Analysis purposes to establish a correlation between the items within each construct. Reliability was evaluated by conducting Cronbach's Alpha to assess internal consistency reliability.

According to Mertens, Amedeo, and Jan (2017), regression models are relevant in determining how one or more independent variables relate to one dependent variable and highlighting the correlation, which measures the strength of the relationship between two variables. Multivariable regression models are used to examine the relationships that exist in variables to determine factors that lead to a particular outcome (Nunez, Steyerberg, & Nunez, 2011). Similarly, Zikmund et al. (2012) assert that studies with one dependent variable take the metric or non-metric analysis approach and utilise multiple regression analysis that permits the dependent variable to be predicted by numerous independent variables. A regression model was performed to test the proposed hypotheses.

Research data undergoes statistical analysis to enable generalisation to the larger population, and to achieve this, data must be simplified into measures that represent the entire sample, forming descriptive statistics (Ali, Bhaskar, & Sudheesh, 2019). Descriptive analysis was conducted for all the constructs of the study. Additionally, an examination was performed

using Pearson's correlation to determine the extent and direction of the linear association between two variables (Kader & Franklin, 2008).

Structural equation models (SEMs), Partial Least Squares (PLS), and a multivariate regression model were used to analyse quantitative data (Mertens et al., 2017). Bagozzi and Yi (2012, p. 8) define SEMs as “statistical procedures for testing measurement, functional, predictive, and causal hypotheses.

3.9 Limitations of the Study

Limitations are potential weaknesses or occurrences that arise in the study and can be found in the chosen research design, statistical model restraints or other factors (Theofanidis & Fountouki, 2018).

The following limitations are identified for the study.

- The study only focused on respondents who were consumers of SSBs prior to the sugar tax and post the implementation of the regulation.
- The selection of respondents relied on referrals, and the respondents were encouraged to pass the study to like-minded respondents. The implication is that the selection of respondents was identified and volunteered by earlier sample members.
- The study is cross-sectional and collected data from respondents at a particular point in time; thus, it does not measure the participants' responses over a period.
- The study used structured closed questions, and the respondent's feelings and emotions about a particular concept were not taken into consideration.

3.10 Validity and Reliability

Reliability and validity are the measurements used to evaluate the methods and tools employed to ensure that the research process and findings are free of error, credible, and without random and unstable faults (Saunders & Lewis, 2018; Schindler, 2019). The premise of research is to produce conclusions that are valid and sound (Marczyk et al., 2010). According to Marczyk et al. (2010), validity ensures that study findings are accurate by eliminating all factors and influences that can potentially detract from the findings.

3.10.1 Validity Analysis

Schindler (2019) defines validity as the extent to which the chosen instrument measures what it is meant to measure. External validity is the degree to which the research conclusions can be generalised to other research contexts or environments (Saunders & Lewis, 2018). The study focused on assessing the relationship between regulatory interventions; in the context of this study, the Sugar Tax and whether it influences the consumption behaviour of SSBs.

Internal validity is the process of carefully designing strong controls for the study (Marczyk et al., 2010) by crafting research questions that will ensure that relevant data will be collected to answer the research questions (Saunders & Lewis, 2018). Content, criterion and construct validity are widely used labels for assessing validity (Adcock & Collier, 2001).

Exploratory Factor Analysis (CFA) was conducted for the study. Yong and Pearce (2013) and Watkins (2018) describe CFA as a process of identifying and reducing large datasets or common factors comprising several variables into groups of variables or descriptive categories. In addition, prior to the study's commencement, a pilot study was conducted to test the validity of the research questionnaire. The pilot study allowed the researcher to identify and resolve problems with the questionnaire before distributing it to all respondents. Further, a pilot study was conducted to ascertain that the respondents would understand the questions that were asked and follow the instructions provided (Saunders & Lewis, 2018).

3.10.2 Reliability

In research, reliability is concerned with the accuracy of a research measurement procedure (Saunders & Lewis, 2018). A measure is said to be reliable only to the degree that it supplies consistent results. According to Tavakol and Dennick (2011), an important concept in evaluating questionnaires to test reliability is Cronbach's Coefficient Alpha, which was conducted for this study to assess reliability. The Cronbach's Coefficient Alpha outcome is a number between 0 and 1, and what is considered an acceptable reliability score is 0.7 or higher (Heale & Twycross, 2015).

3.11 Ethical Considerations

The protection of the rights of the participants or subjects is paramount in research (Cooper & Schindler, 2014). The study was subject to an ethical review procedure as specified by the Wits Business School Research Ethics Committee. Data collection commenced after obtaining approval from the school's ethics committee. Saunders, Lewis, and Thornhill (2019) emphasize the importance of voluntary participation in research. In this study, participants' involvement was entirely voluntary, and they had the right to withdraw at any point during the questionnaire completion process. Additionally, the researcher sent introductory letters to firms and individuals seeking their consent before data collection. This was in line with ethical standards and the Protection of Personal Information Act (POPIA) of South Africa (2013), which prohibits data processing from third parties without consent. Furthermore, confidentiality, privacy, and non-disclosure of participants' data were strictly maintained. No identifying information such as names, identity numbers, or email addresses was requested to ensure anonymity and protect the organizations involved. Data were securely stored in a locked cloud facility and scheduled for deletion after a five-year retention period.

3.12 Chapter Summary

The chapter commenced by elucidating the research paradigms guiding the study, followed by a discussion on the adopted research design and approach. Employing a quantitative methodology, the study relied solely on a questionnaire as its research instrument. The research population was identified, and the sample size was determined accordingly. Data analysis techniques were deliberated upon, with Structural Equation Modelling employed to validate or refute the proposed hypotheses due to the study's quantitative nature. Additionally, the chapter elaborated on how issues pertaining to the reliability and validity of constructs were addressed. Finally, ethical procedures governing the study were outlined, detailing the measures undertaken to ensure adherence to ethical standards throughout the research process.

CHAPTER 4 – DATA ANALYSIS AND PRESENTATION OF RESULTS

4.1 Introduction

This chapter details the outcomes obtained from the study. Data was collected through a self-administering questionnaire. To analyse the data, the researcher collected and cleaned the data using the statistical software package Statistical Package for the Social Sciences (SPSS) version 28. The research methodology outlined in Chapter 3 was adopted to analyse and interpret the study results. The chapter starts by analysing the profile of the study respondents, as outlined in Section B of the research instrument, by gathering participants' demographics. The next section in this chapter outlines the descriptive statistics.

The third section of this chapter focuses on the reliability and validity of the study's measurement scale, followed by the correlation and regression analysis with Consumption Behaviour as the dependent variable and Product Reformulation, Product Size, Price, and Promotion as independent variables and how they were fitted to assess the hypotheses. After that, the regression analysis results are presented. The chapter concludes by presenting the results of each hypothesis proposed in the study.

1.13 Data Cleaning

The study garnered 297 responses, of which 288 consented to the study while nine respondents did not give consent, and thus, the study was terminated for them. Of those who consented, 249 respondents indicated that they consume Sugar-Sweetened Beverages, and 39 did not. The study was terminated for those who indicated that they do not consume sugar-sweetened beverages. Of the remaining respondents, 228 indicated that they consumed sugar-sweetened beverages before 2016, while 17 indicated that they did not consume sugar-sweetened beverages prior to 2016. The study terminated for the 17 respondents. Of the remaining 228 respondents, 213 completed the survey.

A total of 213 complete responses were finalised and deemed useable in the study. The data cleaning involved eliminating all the incomplete responses. After removing the incomplete responses, no missing values were present.

4.3 Demographic Profile of Respondents

A quantitative research approach using a non-probability sampling technique was utilised in this study to assess the consumption behaviour of consumers of SSBs in South Africa. The empirical data was collected through a structured online questionnaire adopting the snowball sampling technique. The snowball sampling technique was appropriate for the research as it was difficult to distinguish individuals who consumed SSBs before the sugar tax implementation and those between the ages of 18 and 59 after its enactment. Snowball sampling facilitates self-recruitment of participants, leading to a higher response rate. Furthermore, the elevated response rate may be attributed to the inherent interest in the study and the expanding research network to which the researcher belongs.

To gather data, the researcher generated a link to the survey in Qualtrics and sent it via email and mobile messaging to contacts in South Africa. The contacts were then asked to share the survey link with others who consume SSBs to increase participation. The demographic data facilitated the generalization of the research findings by indicating that participants possessed some level of knowledge about the subject and could recommend others with similar interests. This enhanced the validity and credibility of the results.

4.3.1 Age

Out of the 213 participants, 13% were 18 – 24 years old, 43% were 25 – 34 years old, and 31% were 35 – 44 years old. Most of the respondents were between the ages of 24 and 35, followed by an age range between 35 and 44. The results are presented in Figure 13.

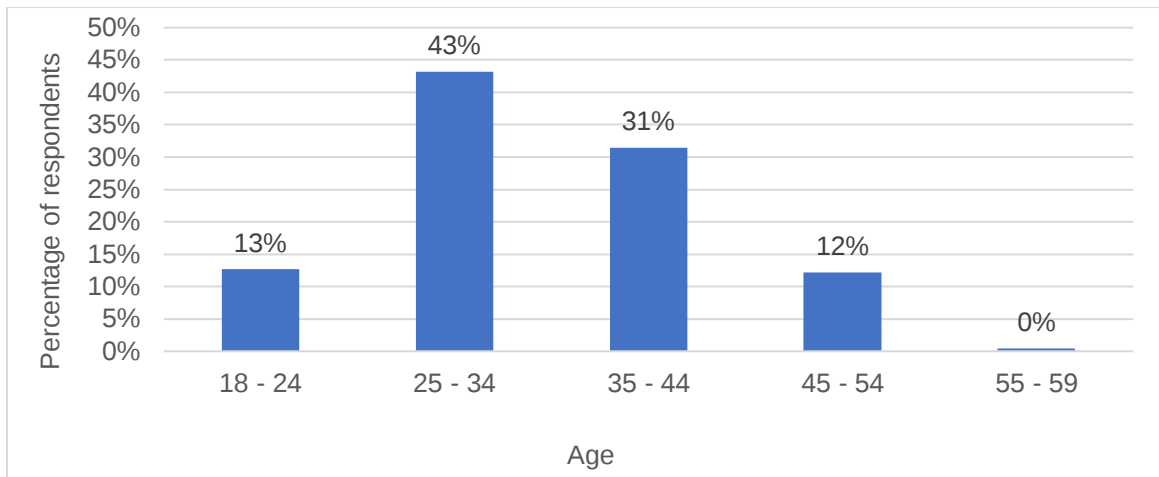


Figure 13 - Respondent Age

4.3.2 Education level

Figure 14 presents the results indicating that 78% of the respondents held either a Diploma, Degree or postgraduate degree, while 19% possessed a matric qualification. Only 2% of the respondents reported not having a matric.

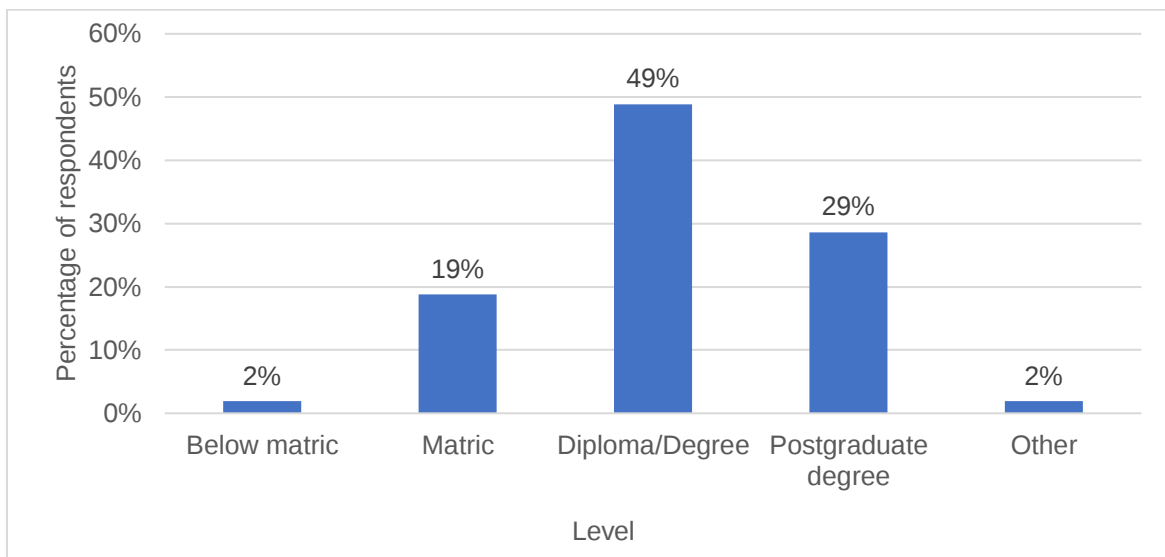


Figure 12 - Respondents Academic Level

4.3.3 Respondents Monthly Income

Most of the respondents (70%) had a monthly income of R10 001 or more, while 15% indicated that they earned less than R4 000 per month. The results are shown in Figure 15.

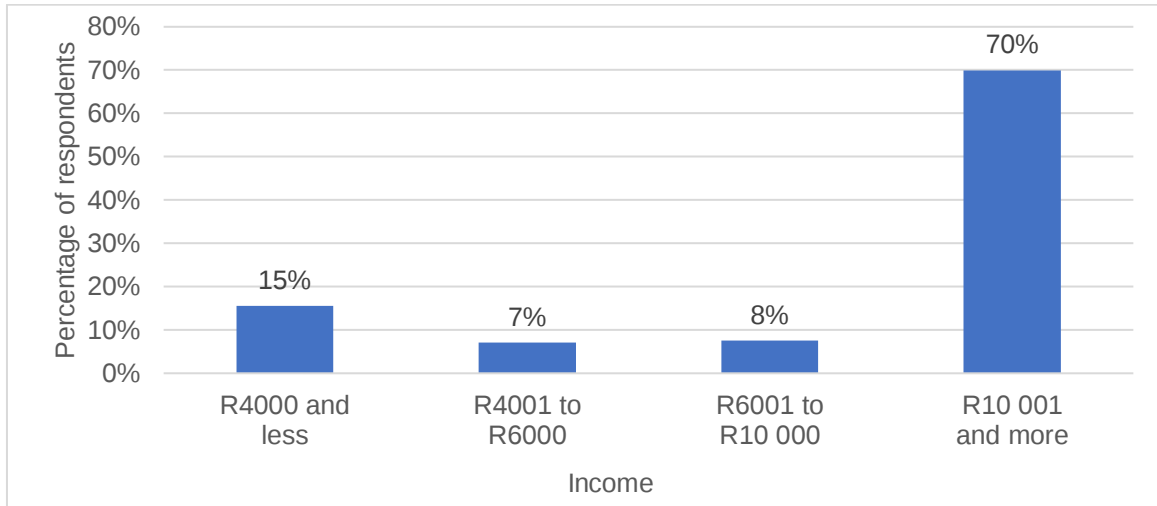


Figure 13 - Respondents Monthly Income

4.3.4 Sugar-Sweetened Behaviour Consumption Behaviour

In Figure 16, respondents were allowed to choose multiple favourite SSB categories. The findings reveal that soft drinks were the most preferred SSB category, selected by 62% of respondents, followed by fruit juice at 54% and sports energy drinks at 46%. Flavoured water was favoured by 31% of respondents, while iced tea was the least preferred SSB category, chosen by only 15% of respondents.

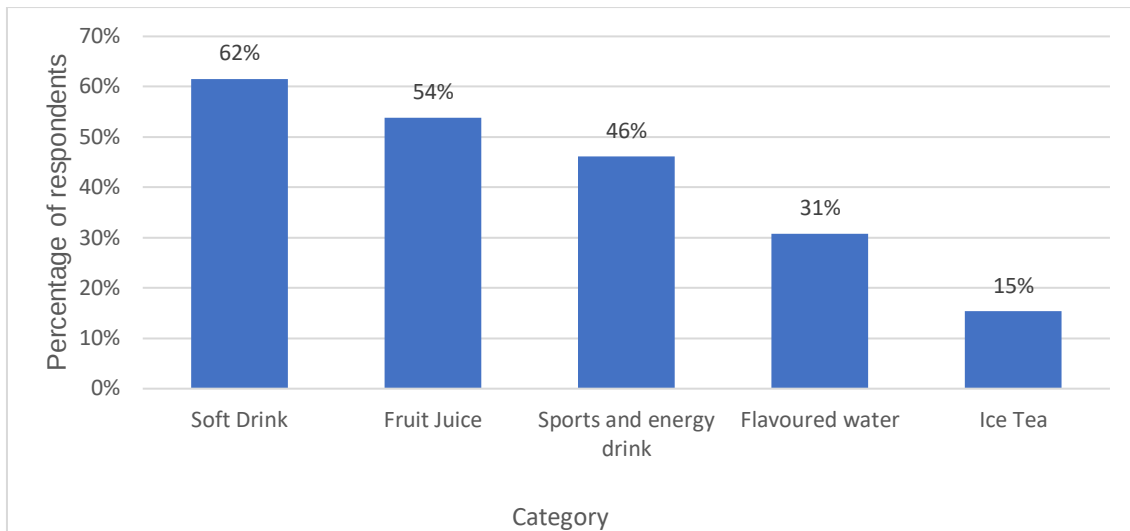


Figure 14 - Favourite Sugar-Sweetened Beverage Category

4.3.5 Respondents Aware of the Sugar Tax and its Implications

Data shows that 58% of the respondents were aware of the Sugar Tax and its implications, while the other 42% were unaware of the Sugar Tax and its implications.

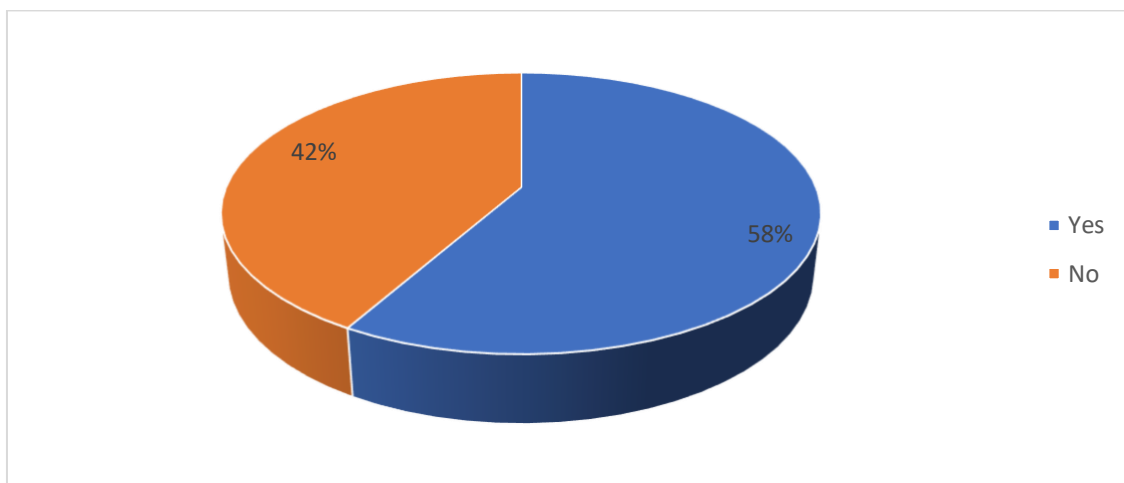


Figure 15 - Respondents awareness of the Sugar Tax

4.4 Descriptive Statistics

The descriptive statistics analysis of each construct was performed using SPSS version 28. According to Kaur, Stoltzfus, and Yellapu (2018), descriptive statistics are essential in analysing initial data, which serve as the basis for comparing variables with inferential

statistical tests. The descriptive statistics of each construct of the study are presented in the next section, detailing the mean and standard deviation scores.

4.4.1 Product Reformulation - Descriptive Statistics

In the context of the Product Reformulation construct, the attribute receiving the highest rating pertained to acknowledging the health benefits associated with the decreased sugar content in a preferred SSB (mean = 5.20 ± 1.85). Additionally, the recognition of the expanded array of options encompassing low-sugar or sugar-free alternatives in sugar-sweetened beverages received an equally high rating (mean = 5.20 ± 1.75). Conversely, the attribute with the lowest rating was the enjoyment of the altered taste in one's favoured SSB (mean = 3.920 ± 1.74). The results are presented in Table 2.

Table 2 - Product Reformulation - Descriptive Statistics

Code	Item	n	Strongly Disagree - Somewhat Disagree	Neither agree nor disagree	Somewhat Agree - Strongly Agree	Mean	SD
PR1	I have noticed changes in the taste of my favourite sugar-sweetened beverage.	213	27%	9%	64%	4.79	1.95
PR2	I have noticed that there is less sugar in my favourite sugar-sweetened beverage.	213	32%	9%	59%	4.53	1.94
PR3	I have noticed a variety of changes in sugar-sweetened beverages to include low-sugar or no-sugar alternatives.	213	18%	8%	74%	5.20	1.75
PR4	I enjoy the new taste of my favourite sugar-sweetened beverage.	213	39%	21%	39%	3.92	1.74
PR5	I prefer the taste of my favourite sugar-sweetened beverages before the reduction in sugar content.	213	23%	21%	56%	4.67	1.88
PR6	I recognise that the reduction in sugar in my favourite sugar-sweetened beverage is for the good of my health.	213	17%	13%	70%	5.20	1.85

4.4.2 Product Size - Descriptive Statistics

Regarding Product Size Regulation, the attribute that garnered the highest rating was the willingness to persist in purchasing one's preferred sugar-sweetened beverage despite

alterations in its size (mean = 5.15 ± 1.62). Subsequently, the recognition of changes in the size of the favoured sugar-sweetened beverage received a moderately high rating (mean = 4.78 ± 1.98). Conversely, the attribute concerning satisfaction with the current package size in terms of perceived value for money regarding the favoured SSB received the lowest rating (mean = 3.67 ± 1.86). The results are presented in Table 3.

Table 3 - Product Size - Descriptive Statistics

Code	Item	n	Strongly Disagree - Somewhat Disagree	Neither agree nor disagree	Somewhat Agree - Strongly Agree	Mean	SD
PS1	I have noticed changes in the size of my favourite sugar-sweetened beverage.	213	27%	12%	61%	4.78	1.98
PS2	The size of my favourite sugar-sweetened beverage has been reduced.	213	35%	11%	54%	4.41	2.04
PS3	I am getting value for money with the current package size of my favourite sugar-sweetened beverage.	213	47%	17%	36%	3.67	1.86
PS4	I am aware of the reason for the change in the size of my favourite sugar-sweetened beverage.	213	33%	20%	46%	4.21	1.76
PS5	I will continue to buy my favourite sugar-sweetened beverage regardless of the changes in its size.	213	15%	11%	74%	5.15	1.62

4.4.3 Product Packaging - Descriptive Statistics

In the context of Product Packaging, the attributes that received the highest ratings were the recognition of alterations in the packaging of one's favoured SSB (mean = 5.15 ± 1.62) and the presence of information pertaining to low-sugar and sugar-free alternatives displayed on the packaging of the preferred drink (mean = 4.9 ± 1.67). Conversely, the attribute indicating a reluctance to purchase the favoured SSB due to the information displayed on the package received the lowest rating (mean = 3.25 ± 1.76). The results are presented in Table 4.

Table 4 - Product Packaging - Descriptive Statistics

Code	Item	n	Strongly Disagree - Somewhat Disagree	Neither agree nor disagree	Somewhat Agree - Strongly Agree	Mean	SD
PP1	I have noticed changes in the packaging of my favourite sugar-sweetened beverage.	213	18%	10%	72%	5.15	1.62
PP2	I read the nutritional labels of sugar-sweetened beverages before I purchase them.	213	53%	10%	37%	3.48	1.90
PP3	There is low-sugar and no-sugar alternative information displayed on the package of my favourite drink.	213	19%	18%	63%	4.90	1.67
PP4	I am discouraged from buying my favourite sugar-sweetened beverage because of the information shown on the package.	213	56%	20%	24%	3.25	1.76

4.4.4 Price - Descriptive Statistics

In the context of Price Regulation, the attribute that received the highest rating was the acknowledgement of an increase in the price of one's preferred SSB (mean = 5.7 ± 1.54). Furthermore, there was a notable awareness of fluctuations in the price of the favoured SSB, albeit with a slightly lower rating (mean = 5.19 ± 1.51). Conversely, the attribute indicating satisfaction with the affordability of the preferred SSB received the lowest rating (mean = 3.36 ± 1.74). The results are presented in Table 5.

Table 5 - Price - Descriptive Statistics

Code	Item	n	Strongly Disagree - Somewhat Disagree	Neither agree nor disagree	Somewhat Agree - Strongly Agree	Mean	SD
P1	The price of my favourite sugar-sweetened beverage has increased.	213	10%	8%	82%	5.70	1.54
P2	My favourite sugar-sweetened beverages are reasonably priced.	213	57%	15%	29%	3.36	1.74
P3	I am mindful of the price changes of my favourite sugar-sweetened beverage.	213	15%	10%	76%	5.19	1.51
P4	The price of my favourite sugar-sweetened beverage affects how often I buy the product.	213	26%	12%	62%	4.77	1.86
P5	I will continue to buy my favourite sugar-sweetened beverage regardless of the price.	213	24%	15%	60%	4.63	1.71

4.4.5 Promotion - Descriptive Statistics

In the realm of Promotion Regulation, the attribute that received the highest rating was the acknowledgement of low-sugar or sugar-free alternatives for one's preferred SSB through media channels (mean = 4.94 ± 1.75). Following closely, awareness of advertisements highlighting the hazards associated with excessive sugar consumption obtained a moderately high rating (mean = 4.83 ± 1.87). Conversely, the attribute indicating the proactive pursuit of nutritional information regarding consumed SSB received the lowest rating (mean = 3.81 ± 1.87). The results are presented in Table 6.

Table 6 - Promotion - Descriptive Statistics

Code	Item	n	Strongly Disagree - Somewhat Disagree	Neither agree nor disagree	Somewhat Agree - Strongly Agree	Mean	SD
PROM1	I am aware of advertisements that show the dangers of consuming a lot of sugar.	213	26%	5%	69%	4.83	1.87
PROM2	I am aware of low-sugar or no-sugar alternatives of my favourite sugar-sweetened beverage through the media.	213	22%	8%	70%	4.94	1.75
PROM3	The media has helped me be more health-conscious about my diet.	213	35%	14%	51%	4.26	1.85
PROM4	The media has given me enough information to reduce my sugar consumption.	213	36%	18%	46%	4.06	1.81
PROM5	There is enough information to help me make informed decisions about my diet in the media.	213	28%	15%	57%	4.47	1.82
PROM6	I go out of my way to find nutritional information about the sugar-sweetened beverages I consume.	213	47%	14%	39%	3.81	1.87

4.5 Reliability and Validity Testing

To ensure that the research process and findings are error-free, credible, and stable, the methods and tools employed were evaluated based on their reliability and validity measurements (Saunders & Lewis, 2018; Schindler, 2019).

4.5.1 Validity Assessment

Exploratory Factor Analysis is a multivariate statistical approach where the researcher approaches the research without predetermined assumptions about the quantity or characteristics of the variables, as indicated by the exploratory nature of the study (Williams, Onsman, & Brown, 2010) and helps to condense data to allow for simple interpretation and comprehension of patterns and relationships by grouping variables into distinct clusters that share a common variance, which ultimately assists in identifying and separating specific constructs and concepts (Yong & Pearce, 2013). Exploratory Factor Analysis was conducted to assess the validity of constructs. Shrestha (2021) states that using factor analysis helps researchers eliminate extraneous and insignificant questions from their final questionnaire and enables them to concentrate on fewer critical factors instead of an extensive list of parameters.

The Kaiser-Meyer-Olkin (KMO), a measure of sampling adequacy, assesses the appropriateness of data for conducting factor analysis (Shrestha, 2021). When conducting factor analysis, the acceptable range for the factor loading coefficient is typically between 0 and 1, with a coefficient of 0.50 deemed appropriate (Williams et al., 2010).

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.739, indicating that the data is adequate for factor analysis since the value was greater than the minimum requirement of at least 0.5. Additionally, Bartlett's Test of Sphericity yielded a p-value of 0.000, implying that the items were correlated and suggesting that the dataset is appropriate for Exploratory Factor Analysis. The results are presented below in Table 7.

Table 7 - KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.739
Bartlett's Test of Sphericity	Approx. Chi-Square	777.756
	df	91
	Sig.	.000

The Total Variance Explained of 59.474% indicates that the retained four constructs explain 59.474% of the variance in the initial items. There were four factors retained because four factors had values greater than 1.

The assessment of validity using Exploratory Factor Analysis resulted in the retention of four constructs from the initial five constructs of the study. The retained constructs are Product Reformulation, Product Size, Promotion and Price. The discarded construct is Product Packaging.

Table 8 - Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.524	25.171	25.171	3.018	21.559	21.559	2.507
2	2.255	16.108	41.279	1.771	12.646	34.206	2.089
3	1.289	9.210	50.489	.819	5.847	40.053	1.802
4	1.258	8.985	59.474	.739	5.278	45.331	1.498
5	.950	6.785	66.259				
6	.808	5.772	72.032				
7	.758	5.413	77.445				
8	.579	4.133	81.578				
9	.542	3.869	85.447				
10	.514	3.673	89.120				
11	.485	3.466	92.586				
12	.404	2.885	95.471				
13	.370	2.644	98.115				
14	.264	1.885	100.000				
Extraction Method: Principal Axis Factoring.							
a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.							

Shrestha (2021) supports the use of the Scree test to determine the number of factors to extract. The scree plot presented in Figure 18 indicates that there was a steep slope for the first four factors, and the line graph flattened out after four factors. This confirms that, indeed, four factors were retained.

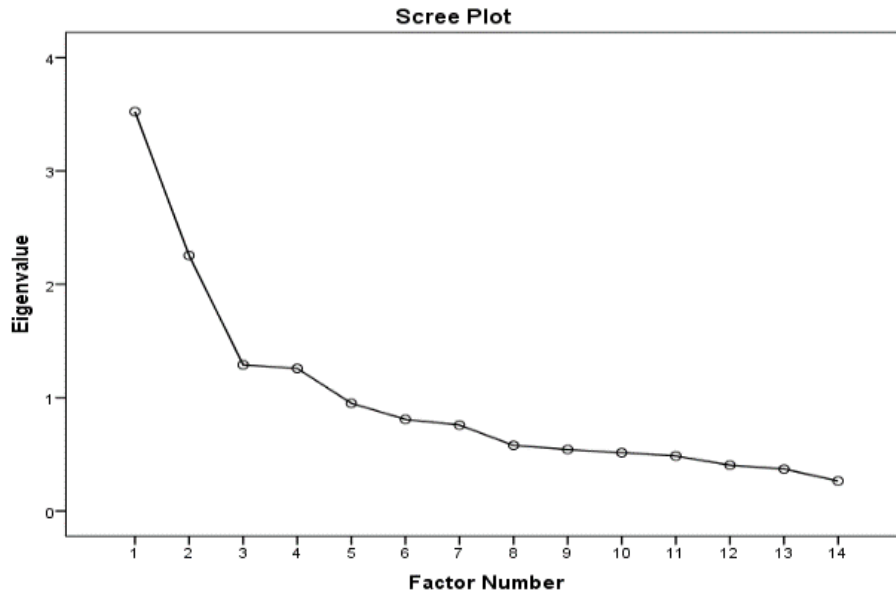


Figure 16 - Scree Plot

Table 9 summarises the factor composition of the retained factors. All the items within each factor had a factor loading higher than at least 0.3. The items loaded highly onto their respective constructs and not on other constructs. This confirms that there were four valid constructs. There was no valid construct for the Product Packaging regulation construct.

Table 9 - Pattern Matrix

Construct		Factor			
		1	2	3	4
Product Reformulation	PF2 Product Formulation - I have noticed that there is less sugar in my favourite sugar-sweetened beverage.	.814			
	PF1 Product Formulation - I have noticed changes in the taste of my favourite sugar-sweetened beverage.	.734			
	PF3 Product Formulation - I have noticed a variety of changes in sugar-sweetened beverages, including low-sugar or no-sugar alternatives.	.544			
	PS1 Product Size - I have noticed changes in the size of my favourite sugar-sweetened beverage.	.504			
	PF5 Product Formulation - I prefer the taste of my favourite sugar-sweetened beverages before the reduction in sugar content.	.397			
Promotion	PROM4 Promotion - The media has given me enough information to reduce my sugar consumption.		.935		
	PROM3 Promotion - The media has helped me be more health-conscious about my diet.		.670		
	PROM5 Promotion - There is enough information to help me make informed decisions about my diet in the media.		.627		
Price	P3 Price - I am mindful of the price changes of my favourite sugar-sweetened beverage.			.761	
	P4 Price - The price of my favourite sugar-sweetened beverage affects how often I buy the product.			.591	
	P1 Price - The price of my favourable sugar-sweetened beverage has increased.			.516	

Product Size	PS4 Product Size - I am aware of the reason for the change in the size of my favourite sugar-sweetened beverage.				.749
	PS3 Product Size - I am getting value for money with the current package size of my favourite sugar-sweetened beverage.				.453
	PP2 Product Packaging - I read the nutritional labels of sugar-sweetened beverages before I purchase them.				.359
Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.					
a. Rotation converged in 6 iterations.					

4.5.2 Reliability Analysis

Cronbach's Alpha was conducted to assess internal consistency reliability. The results presented in Table 10 show that there was good reliability for the Promotion construct (3 items, $\alpha = 0.804$). There was an acceptable reliability level for the Product Reformulation construct (5 items, $\alpha = 0.744$), indicating that the items related to this construct are consistent in measuring the same underlying concept. The Price construct (3 items, $\alpha = 0.649$) has a moderate internal consistency among the items related to Price. The Product Size construct (3 items, $\alpha = 0.508$) indicates a lower level of internal consistency compared to the other constructs. It suggests that the items related to Product Size might not be as consistent in measuring the same underlying concept. The reliability for the four constructs was acceptable for this research as they were greater than 0.5, below which the reliability becomes unacceptable.

Since the reliability levels were acceptable, items within each construct were combined to form a composite scale. The composite scale for each scale was computed by taking an average of the items within that scale after Exploratory Factor Analysis.

Table 10 - Reliability of Scale

Construct	N of Items	Cronbach's Alpha	Reliability Level
Product Reformulation	5	.744	Acceptable
Promotion	3	.804	Good
Price	3	.649	Acceptable
Product Size	3	.508	Poor

1.6 Conceptual Model Framework

Data analysis indicated no valid construct for the Product Packaging Regulation (H3) construct, which was ultimately eliminated from the study. The elimination of the construct

necessitates a revision of the study's conceptual framework presented in Chapter 2, figure 12. The conceptual framework had five constructs, and the revised framework, shown in Figure 19, has four constructs retained for the study.

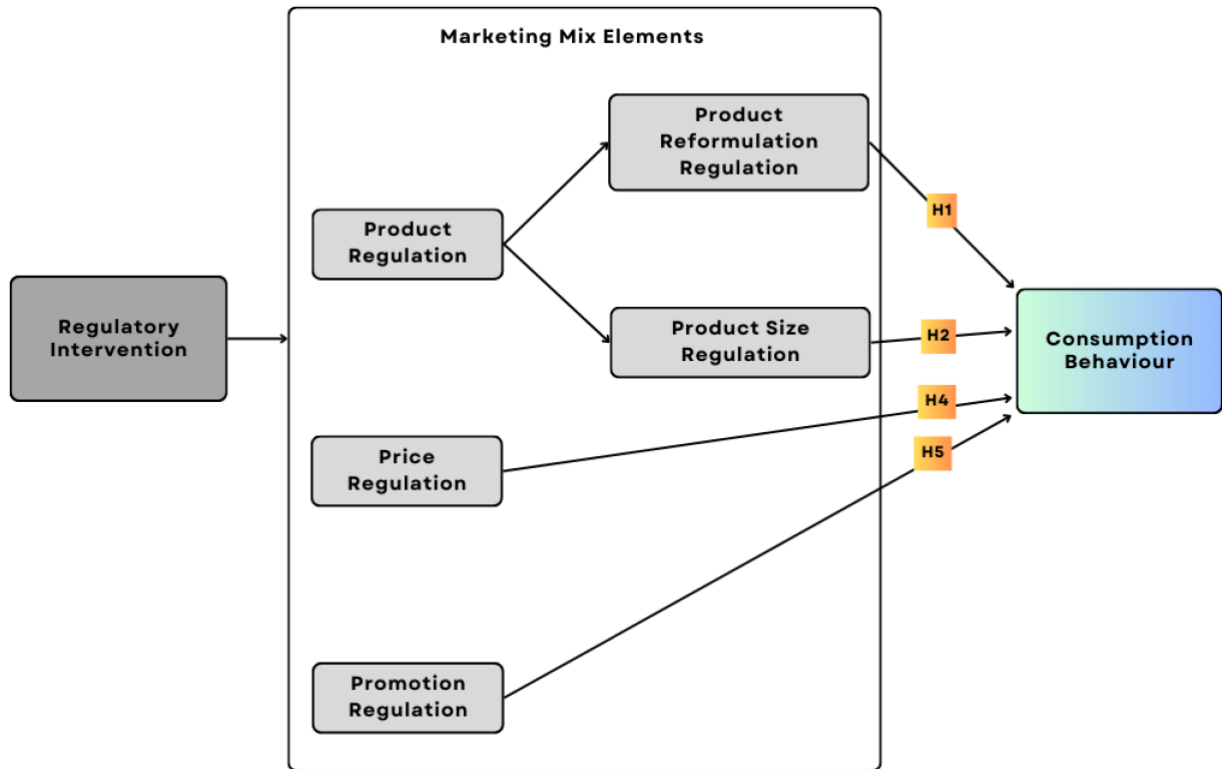


Figure 17 - Conceptual Framework

4.7 Correlation Analysis

Schober, Boer, and Schwarte (2018) define correlations as a measure of an association between variables to test if the variables correlate. Based on the composite scales presented in Table 11, Price (mean = 5.22±1.26) was the highest-rated construct, followed by Product Reformulation (mean = 4.80±1.34), Consumption Behaviour (mean = 4.28±1.57), Promotion (mean = 4.26±1.55), and the least rated was Product Size (mean = 3.79±1.31). Pearson's correlation analysis results indicated that Product Reformulation ($r = 0.210$, $p\text{-value} < 0.000$) had a significant positive correlation with Consumption Behaviour. Promotion ($r = 0.024$, $p\text{-value} > 0.05$) and Price ($r = 0.064$, $p\text{-value} > 0.05$) had a positive but insignificant correlation with consumption, while Product Size ($r = -0.121$, $p\text{-value} > 0.05$) had a negative but insignificant correlation with Consumption Behaviour.

Table 11- Descriptive Statistics and Pearson's Correlation

Construct	Descriptive Statistics		Pearson's Correlation				
	Mean	Std. Deviation	Product Reformulation	Promotion	Price	Product Size	Consumption Behaviour
Product Reformulation	4.80	1.34	1				
Promotion	4.26	1.55	.183**	1			
Price	5.22	1.26	.388**	.096	1		
Product Size	3.79	1.31	.190**	.361**	.085	1	
Consumption Behaviour	4.28	1.57	.210**	.024	.064	-.121	1

4.8 Regression Analysis

According to Chatterjee and Hadi (2013), regression analysis is a widely used statistical tool to analyse multifactor data to investigate functional relationships amongst different variables. A multilinear regression model with Consumption Behaviour as the dependent variable and Product Reformulation, Product Size, Price, and Promotion as independent variables was performed to assess the hypotheses.

4.8.1 Regression results

The model summary presented in Table 12 shows that Product Reformulation, Product Size, Price, and Promotion explained 7.3% of Consumption Behaviour as indicated by an r-square of 0.073.

Table 12 - Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.271 ^a	.073	.055	1.52375	2.002
a. Predictors: (Constant), Product Size, Price, Promotion, Product Reformulation					
b. Dependent Variable: Consumption Behaviour					

Regarding the Analysis of Variance (ANOVA), the emphasis is on discerning the variations between variances (Kim, 2017). ANOVA results shown in Table 13 indicate a p-value of 0.003, which implies that a model with Product Reformulation, Product Size, Price, and Promotion as the independent variables was significant in predicting Consumption Behaviour. This is because the p-value was less than 0.05.

Table 13 - ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	38.164	4	9.541	4.109	.003 ^b
	Residual	482.934	208	2.322		
	Total	521.099	212			
a. Dependent Variable: Consumption Behaviour						
b. Predictors: (Constant), Product Size, Price, Promotion, Product Reformulation						

Coefficients presented in Table 14 show that Product Reformulation Regulation ($\beta = 0.244$, t -value = 3.296, p -value = 0.001) and Product Size ($\beta = -0.183$, t -value = -2.532, p -value = 0.012) had significant impacts on Consumption Behaviour since the p -values were less than 0.05. On the other hand, Promotion ($\beta = 0.048$, t -value = 0.662, p -value = 0.509) and Price ($\beta = -0.02$, t -value = -0.273, p -value = 0.785) had no significant effect on consumption behaviour as the p -values were greater than 0.05.

Table 14 - Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.663	.569		6.433	.000		
	Product Reformulation	.286	.087	.244	3.296	.001	.815	1.227
	Promotion	.048	.073	.048	.662	.509	.856	1.169
	Price	-.025	.090	-.020	-.273	.785	.849	1.179
	Product Size	-.219	.087	-.183	-2.532	.012	.854	1.171
a. Dependent Variable: Consumption Behaviour								

4.9 Hypothesis Results

4.9.1 Results pertaining to Hypothesis 1 (H1)

Product Reformulation Regulation positively and significantly influences the consumption of SSBs in South Africa. The results presented in Table 14 show that Product Reformulation Regulation ($\beta = 0.244$, t -value = 3.296, p -value = 0.001) had a positive and significant effect on Consumption Behaviour. Following the guideline outlined by Hair et al. (2022), which suggests a standard testing threshold of 95% confidence level and a 5% margin of error, the study's findings were upheld as the p -value was less than 5%. This outcome indicates that

the study successfully demonstrated the impact of product reformulation regulation on SSB consumption in South Africa.

4.9.2 Results pertaining to Hypothesis 2 (H2)

The results demonstrated that Product Size Regulation in SSBs negatively and insignificantly influences the consumption of SSBs in South Africa. The results presented in Table 14 show that Product Size Regulation ($\beta = -0.183$, t-value = -2.532, p-value = 0.012) had a negative and insignificant influence on Consumption Behaviour. The relationship was negative because of the coefficient ($\beta = -0.183$). Consistent with the rule of thumb of Hair et al. (2022), the hypothesis was rejected with 95% confidence and a 5% margin of error.

4.9.3 Results pertaining to Hypothesis 3 (H3)

The Product Packaging Regulation construct was not assessed since it was not valid and has thus been eliminated from the study.

4.9.4 Results pertaining to Hypothesis 4 (H4)

The results showed that the Price Regulation of SSBs significantly influences the consumption of SSBs in South Africa. It can be noted from the results presented in Table 14 that Price Regulation ($\beta = -0.02$, t-value = -0.273, p-value = 0.785) has a negative and insignificant influence on Consumption Behaviour. The relationship was negative because the coefficient ($\beta = -0.02$) indicated a small negative relationship between Price and Consumption Behaviour. With the continued alignment on the interpretation of results, the study adopted Hair et al. 's (2022) rule of thumb for rejecting this hypothesis, as the p-value was above 0.05.

4.9.5 Results pertaining to Hypothesis 5 (H5)

The results showed that promotion regulation of the sugar tax positively and insignificantly influenced the consumption of SSBs in South Africa. Results presented in Table 14 show that Promotion Regulation ($\beta = 0.048$, t-value = 0.662, p-value = 0.509) had a positive but insignificant relationship with Consumption Behaviour. The relationship was positive

because the coefficient ($\beta = 0.048$) suggests that there is a very small positive relationship between promotion and Consumption Behaviour. A p-value of 0.509 greater than 0.05, meant that the study rejected the proposed hypotheses, guided by Hair et al. (2022). The findings implied that promotion regulation might not significantly impact Consumption Behaviour.

4.10 Regression Assumptions Diagnostics

4.10.1 Test for Collinearity

The correlation matrix shown in Table 11 indicates that the correlation between consumption behaviour and each of the independent variables, product reformulation, product size, price, and promotion, were non-zero, indicating that there was linearity. Thus, the assumption of linearity was met.

4.10.2 Test for Normality

The assumption for normality was tested by plotting a histogram of regression residuals. The residuals almost fit under the normal curve, indicating that the residuals approached normal distribution. Thus, the normality of the residual assumption was also met, as presented in Figure 20.

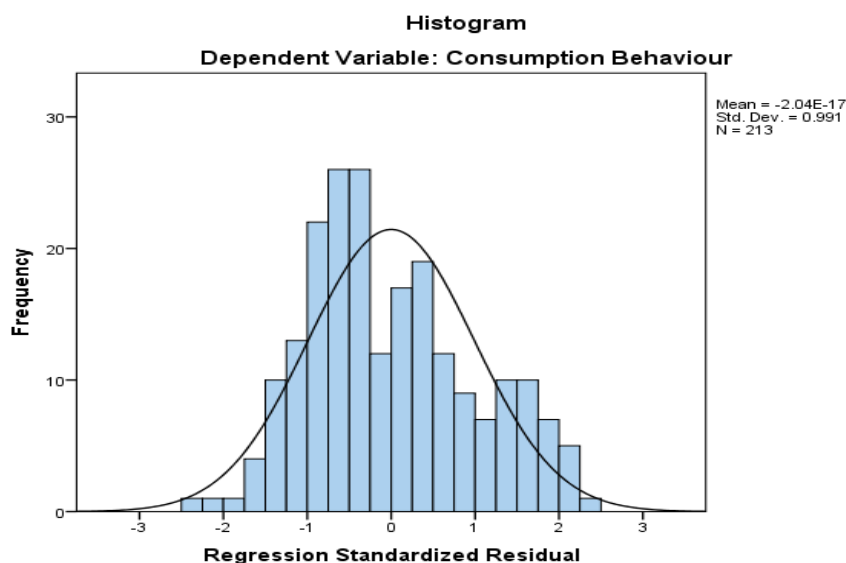


Figure 20 - Histogram of Residuals

4.10.3 Test for Multicollinearity

The Variance Inflation Factor (VIF) scores presented in Table 15 show that all values were lower than 10, indicating that there was no problem with multicollinearity. Thus, the no multicollinearity assumption was also met. This is because all VIF values must be above 0.5 (Hair et al., 2017).

Table 15 - Test for Multicollinearity

Model	Collinearity Statistics	
	Tolerance	VIF
Product Reformulation	.815	1.227
Promotion	.856	1.169
Price	.849	1.179
Product Size	.854	1.171

4.10.4 Test for Homoscedasticity

A scatter plot of regression residuals against standardised predicted values shows that the residuals were randomly distributed around the zero line. This implies that the assumption of homoscedasticity was met.

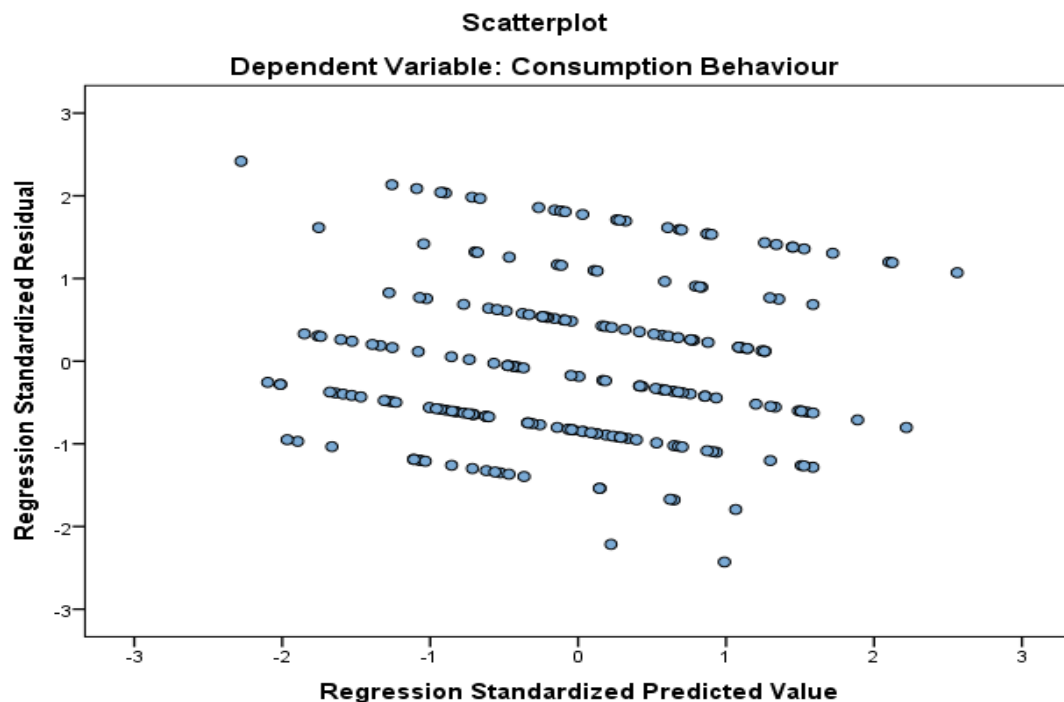


Figure 18 - Scatter Plot of Residuals

4.10.5 Test for Independence

A Durbin-Watson value of 2.0002, as shown in Table 12, suggests that the residuals are approximately independent of each other, as required for a multilinear regression model. This independence assumption is essential for drawing accurate inferences from the regression analysis. Thus, the independence assumption was also met. Since all five regression assumptions were met, it can be concluded that the regression results were reliable.

4.11 Summary of The Results

This chapter presented the results from analysing the data collected for the research study. The demographic profile of the respondents was outlined, and the descriptive statistics for each of the study constructs were analysed. The validity of the study was conducted through Exploratory Factor Analysis, while the reliability to test internal consistency was assessed through Cronbach's Alpha.

Table 4.1 Summary of Hypotheses Results

Hypothesis Relationship	Hypothesis	Coefficients β	P Value	Supported/Rejected
Product Reformulation Regulation → Consumption Behaviour	H1	$\beta = 0.244$	0.001	Supported
Product Size Regulation → Consumption Behaviour	H2	$\beta = -0.183$	0.001	Supported
Price Regulation → Consumption Behaviour	H4	$\beta = -0.02$	0.795	Rejected
Promotion Regulation → Consumption Behaviour	H5	$\beta = 0.048$	0.509	Rejected

The data analysis findings revealed that the Product Packaging Regulation (H3) construct lacked validity and was therefore excluded from the study. The revised conceptual framework, which omits this construct, is presented in this chapter. Of the four remaining hypotheses (H1, H2, H4, and H5), the analysis demonstrated that Product Reformulation (H1) and Product Size (H2) exerted a significant influence on the Consumption Behaviour of SSBs. Specifically, Product Reformulation (p-value of 0.001) and Product Size (p-value

of 0.012) were less than the significance level of 0.05. However, it is worth noting that Product Size had a more substantial impact on Consumption Behaviour than Product Reformulation. Conversely, Promotion (p-value = 0.509) and Price (p-value = 0.785) had no significant effect on the Consumption Behaviour of SSBs, as their p-values exceeded the significance level of 0.05.

CHAPTER 5 – DISCUSSION OF THE RESULTS

5.1 Introduction

The chapter discusses the respondents' demographic data, along with an examination of the four hypotheses that were proposed and tested in the study. These hypotheses, which are Product Reformulation, Product Size, Price, and Promotion, were evaluated in terms of their influence on the Consumption Behaviour of SSBs. The discussions in the chapter are aimed at examining if the proposed hypothesis results are consistent or contradictory to the findings of other past studies.

5.2 Demographic Results Discussion

The study participants were requested to provide their demographic details, which included their gender, age, level of education, and monthly household income. Furthermore, the participants were prompted to disclose their awareness of the sugar tax and specify their preferred SSB categories.

The age distribution among the respondents was analysed, revealing that 13% were aged 18 to 24, 43% were aged 25 to 34, and 31% were aged 35 to 44. The age profiling demonstrates that most respondents fall within the 25 to 34 age range (43%), followed by the 35 to 44 age range (31%). According to Statistics South Africa (2019), the youth age range in the country is between 15 and 34, which accounts for 35.1% of the entire population and adults aged 35 to 59 make up 27.1% of the population. These findings suggest that the study respondents are representative of the country's demographics across the two major population age breakdowns (Appendix 1).

Regarding the educational level of the respondents, 78% of them either had a diploma, degree, or postgraduate degree. 19% indicated that they had a matric, and only 2% stated that they had not completed their matric qualification.

The majority of respondents (70%) earned an income of R10 001, while 15% earned an income of between R4001 and R10 000. According to the Department of Labour (2023), the National Minimum Wage in South Africa is R25,42 X 40 hours a week, translating to R4405,79 per month or R4956,52 per month for a 45-hour workweek. The study results

show that most respondents, almost 80%, earn more than the stipulated National Minimum Wage.

The level of awareness regarding the Sugar Tax was found to be imbalanced, with the majority of respondents stating that they were aware of it. Specifically, 58% of the participants demonstrated knowledge of the Sugar Tax and its associated consequences, while the remaining 42% lacked awareness of its existence. Although the study found that 58% of the respondents were aware of the sugar tax, 42%, which is significant, were still unaware of its implications, indicating a considerable knowledge gap. The findings of this study are similar to previous studies on the sugar tax by Essman et al. (2022), Bosire et al. (2020), and Stacey et al. (2017), who all found that awareness of the introduced sugar tax remained low in South Africa.

Based on the study's demographics, there is a correlation between income, education level, and an individual's knowledge of economic and health issues. This is particularly relevant in the case of the sugar tax, as the study reveals that those who earn above the National Minimum Wage and have post-matric qualifications are more likely to have an average knowledge of the tax and its implications. The suggestion derived from these findings is that more affluent citizens with access to resources will likely be aware of public policies that impact their lives. Additionally, the findings highlight the importance of age as a factor, as certain health conditions may be more prevalent in older populations. Hence, there is limited awareness of the sugar tax amongst the respondents.

5.3 Hypothesis Results Discussion

The main research objective was to investigate the influence of regulatory interventions related to the implementation of the Sugar Tax on the Consumption Behaviour of SSBs among South African consumers.

Here is an overview of the testing conducted on the hypotheses, followed by a comprehensive examination of each hypothesis based on the available empirical evidence.

Table 16 - Hypothesis Testing Summary

Hypothesis Relationship	Hypothesis	Coefficients β	P Value	Supported/Not Supported
Product Reformulation Regulation → Consumption Behaviour	H1	$\beta = 0.244$	0.001	Supported
Product Size Regulation → Consumption Behaviour	H2	$\beta = -0.183$	0.001	Supported
Price Regulation → Consumption Behaviour	H4	$\beta = -0.02$	0.795	Rejected
Promotion Regulation → Consumption Behaviour	H5	$\beta = 0.048$	0.509	Rejected

The findings of the study demonstrate the imperial results, which have lent support to two of the four retained hypotheses, as outlined in Table 16. The results presented in the study indicate that the Product Reformulation Regulation has a positive effect on the Consumption Behaviour of SSBs, as evidenced by the value of the coefficient $\beta = 0.244$ and p-value less than 0.05. Conversely, the Product Size Regulation has a significant effect on the Consumption Behaviour of SSBs, as indicated by the p-value of 0.001. Furthermore, the Price Regulation has been found to have an insignificant relationship with the Consumption Behaviour of SSBs, with a p-value of 0.795. Lastly, the Promotion Regulation has an insignificant effect on the Consumption Behaviour of SSBs, with a p-value of 0.509.

5.3.1 Product Reformulation Regulation – Consumption Behaviour

Hypothesis 1 (H1) - Product Reformulation Regulation has a direct positive relationship with the Consumption Behaviour of SSBs in South African consumers.

The initial variable investigated in the research was the relationship between Product Reformulation Regulation and the Consumption Behaviour of SSBs. The study results show a significant positive relationship between Product Reformulation Regulation and the Consumption Behaviour of SSBs. The positive relationship between Product Reformulation Regulation, which reduced sugar content in SSBs, is supported by prior studies conducted by several authors (Colchero et al., 2016; Essman et al., 2021; Hofman et al., 2021; Stacey et al., 2021), who found a positive correlation between the reformulation of SSBs in response to the sugar tax.

The findings of this study are further corroborated by the results of the study conducted by Smit, Ebrahim, Marais, Nel, and Koen (2023), which indicate that the sugar tax implementation has led to a significant decrease in the consumption of SSBs among dietitian clients; specifically, their clients have shown a greater inclination towards purchasing sugar-free drinks and water instead of sugary beverages. The findings are also consistent with the theory of Consumer Buying Decision Process and Consumer Behaviour, which suggests that the consumer buying decision process initiates with the customer recognising a need or problem requiring resolution. Subsequently, the customer seeks information to address the identified need, potentially leading to a comparison of various alternatives (Bray, 2008; Jisana, 2014). The study's findings indicate a significant influence of Product Reformulation Regulation on the Consumption Behaviour of the study participants, supported by the statistical significance of the p-value being less than 0.05. The implication is that the participants of the study exhibited a certain degree of change in their consumption patterns of SSBs in response to the product reformulations introduced due to the imposition of the sugar tax.

5.3.2 Product Size Regulation – Consumption Behaviour

Hypothesis 2 (H2) – Product Size Regulation has a negative but significant effect on the Consumption Behaviour of SSBs in South Africa.

As depicted in Table 14, Product Size Regulation has a negative and significant relationship with the Consumption Behaviour of SSBs among South African consumers. The relationship was negative because of the coefficient ($\beta = -0.183$). There is alignment with assertions by Cleghorn et al. (2019) that focusing on portion control and product size are two effective methods to address the health risks associated with excessive intake of SSBs. According to Crino et al. (2017), portion size reduction pertains to the reduction in the quantity of a product, which is typically accomplished through alterations in the package size or a reduction in the energy density per serving in a sugar-sweetened beverage (SSB). Although the relationship was negative, it was significant, as supported by a p-value less than 0.05.

Several studies provide evidence to confirm that the size of a product or its packaging has a definitive influence on the quantity of food or beverage consumed by an individual in a

single serving (Crino et al., 2017; Hollands et al., 2015; Liu et al., 2013; Mantzari et al., 2017).

The study's findings indicate that reducing the size of SSB products can be an effective strategy for promoting better portion control and ultimately reducing consumption. By reducing the size of the product, consumers are more likely to consume less overall, which helps to address issues related to overconsumption. However, it is worth noting that while 19% of the study participants noticed changes in the size of their preferred SSBs, 14% indicated that they would continue to purchase their favourite SSB despite the reduced portion size. This suggests that consumers are willing to adapt to changes in product size, but there may be limits to their willingness to change their consumption habits despite some feeling they were not getting value for money when purchasing smaller-sized SSBs.

5.3.3 Price Regulation – Consumption Behaviour

Hypothesis 4 (H4) – Price Regulation has a direct negative relationship with the Consumption Behaviour of SSBs in South African consumers.

The results of the study indicate a negative and insignificant relationship between Price and Consumption Behaviour. The negative relationship is attributed to the slight negative coefficient ($\beta = -0.02$) between price and consumption behaviour. However, the p-value of 0.785 allowed the researcher to reject the proposed hypothesis. This implies that the price of SSBs does not influence consumption.

The existing body of literature on price indicates that adjustments in the pricing of SSBs are associated with a decline in the use and consumption of such beverages (Smit et al., 2023). According to Steenhuis et al. (2011), the price consciousness of low-income consumers is relatively higher, resulting in a more pronounced impact of price on their food choices compared to high-income consumers. The outcomes of the research demonstrate correspondence with the characteristics of the participants of the study, who predominantly (80%) fall under the category of individuals earning above the National Minimum Wage of R4956.52 per month. Moreover, a considerable proportion (70%) of the respondents have a monthly income of R10 001 or more. Stacey et al. (2021) posit that the increase in prices of SSBs is effectively transferred to the end consumers via retail prices, thereby leading to a considerable hike in the consumption cost of most SSBs by quantity; however, despite the

intention of the increases of SSB prices to reduce consumption (Essman et al., 2022), in observation of the study results and the demographics of the respondents, price does not have a significant influence on the consumption of SSBs.

Although numerous studies show that reducing the affordability of a product lessens the consumption of that particular product (Scarborough et al., 2020; Sharma et al., 2017; Silver et al., 2017; Stacey et al., 2021), the findings of this study support the assertion by (Colchero et al., 2016; Stacey et al., 2021) that the decrease in consumption was primarily observed among low-income consumers, which aligns with the results of this study, which mainly included participants earning above the National Minimum Wage.

Some inferences can be made from the study conducted by Wrottesley et al. (2021) and Bosire et al. (2020), which identified factors such as habit, addition, accessibility and advertising as noteworthy factors that encouraged participants to purchase and consume SSBs despite the changes in prices. The findings further enhance the argument by (Gittelsohn et al., 2017) that there is hardly consensus in the literature about pricing strategies and their efficacy in modifying consumption behaviour. Additionally, there is a dearth of empirical evidence illustrating how pricing strategies operate in tandem with health behaviour interventions to effect a shift in consumption behaviour. Lehner et al. (2016) attribute this to findings that the impact of policy interventions can vary significantly due to the intricate and multifaceted nature of human behaviour and the diverse contexts in which these interventions are implemented.

5.3.4 Promotion Regulation – Consumption Behaviour

Hypothesis 5 (H5) – Promotion Regulation has a positive and insignificant effect on the Consumption Behaviour of SSBs in South Africa.

Promotion, one of the essential components of the marketing mix, comprises various marketing communication elements, including advertising, public relations, sponsorships, and e-commerce elements like online advertisements and outbound emails (Bin Abdul Lasi & Salim, 2020; Khan, 2014). The findings of the study revealed that Promotion Regulation had a positive but insignificant relationship with Consumption Behaviour. The coefficient value ($\beta = 0.048$) indicates that there is a small positive relationship between Promotion

Regulation and Consumption Behaviour. However, since the p-value (0.509) is greater than the significance level of 0.05, it suggests that the null hypothesis is accepted. This implies that Promotion Regulation has an insignificant influence on Consumption Behaviour.

The study found that 58% of the respondents demonstrated an awareness and understanding of the Sugar Tax and its associated consequences. The remaining 42% were unaware of the Sugar Tax and its implications. Even though a considerable majority exhibited awareness, the fact that 42% remained unaware of the regulation is noteworthy as it represents a significant number of people unaware of its existence. The awareness levels could be attributed to the findings by Murukutla et al. (2020), who asserted that mass communication campaigns are critical for the success of advancing public health intervention efforts. Despite the communication efforts at the launch of the regulation, which slightly increased awareness levels of the risks associated with the overconsumption of sugar, the awareness of the introduced sugar tax remained low (Essman et al., 2022), and this is evidenced by the results of this study.

The criticism by Stacey et al. (2017) that the South African government has not taken a proactive approach towards regulating marketing messages to promote knowledge sharing about the potential health risks associated with sugar consumption is corroborated by the findings of this study. Despite the limited government communication efforts, there has been a marked increase in the marketing and advertising of sugary drinks in South Africa across various media platforms (Stacey et al., 2017). Boachie et al. (2023) substantiate these assertions by stating that following the introduction of the Health Promotion Levy (HPL) in June 2016, which imposed a tax on sugary drinks, South African manufacturers increased their advertising budgets. The study by Boachie et al. (2023) reveals that, in South Africa, the manufacturers of SSBs have invested a considerable sum of ZAR 3.7 billion (equivalent to USD 191 million) in advertising their products through various media channels between 2013 and 2019, with television advertising accounting for the largest share of this expenditure, with a particular emphasis on times when children and families were most likely to be watching.

The study, in line with the findings of Stacey et al. (2017), indicates that the government has struggled to communicate the benefits of the sugar tax to the public effectively. The findings suggest that a mere 6% of the participants were aware of advertisements demonstrating the harmful effects of excessive sugar consumption. This lack of awareness

could be attributed to the government's inadequate efforts to promote the benefits of the sugar tax and educate the public on the potential health risks of consuming SSBs. Furthermore, the study revealed that 13% of the participants actively searched for nutritional information about the SSBs they consume. Such a finding highlights the need for more accessible and informative models on SSBs to enable consumers to make informed choices.

5.4 Chapter Summary

The primary objective of the research was to examine the impact of regulatory interventions implemented through the Sugar Tax on the consumption habits of South African consumers concerning SSBs. This chapter presented the demographic characteristics of the participants and compared the findings with the literature. Furthermore, a detailed discussion of each hypothesis reveals that the study's findings provide evidence supporting two of the four retained hypotheses, namely Product Reformulations Regulations and Promotion Regulation, which positively impacted the Consumption Behaviour of SSBs. On the other hand, the Product Size Regulation and Price regulation had a negative influence on the Consumption Behaviour of SSBs.

The study's results suggest that despite progress being made to reduce the excessive intake of SSBs, it is happening slowly and not yet according to the desired targets.

CHAPTER 6 – CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

The preceding chapters have expounded on the outcomes and insights from the research. This section concludes the study by presenting a comprehensive summary of the findings, furnishing specific recommendations, and proposing potential avenues for future research.

6.2 Conclusions of the Study

The study explored the influence of regulatory interventions on the consumption behaviour of SSBs in South Africa. Several regulatory interventions were examined, which included Product Reformulation Regulation, Product Size Regulation, Price Regulation, and Promotion Regulation. Notably, the Product Package Regulation was not included in the analysis of the study's final results due to a lack of valid constructs. The research focused on how regulatory interventions (independent variable) influenced the Consumption Behaviour of SSBs (dependent variable), and the hypotheses tested several independent variables against one dependent variable. Furthermore, the study comprised moderating variables, defined by Cooper and Schindler (2014) as independent variables that significantly impact the independent and dependent variables.

The study concluded that a positive relationship exists between Product Reformulation Regulation and Consumption Behaviour, Promotion Regulation and Consumption Behaviour of SBBs in South Africa. On the other hand, the study found a negative relationship between Product Size Regulation and Consumption Behaviour, as well as between Price Regulation and Consumption Behaviour of SBBs.

6.3 Recommendations

The study aimed to enhance the understanding and knowledge of the Sugar Tax, a regulatory intervention that falls under the category of upstream public health strategies. Upstream health strategies are characterised by interventions that enforce regulations, such as smoke-free legislation and alcohol age restrictions, according to Capewell and Lloyd-Williams (2018). As stated by Pearson et al. (2013), the Sugar Tax is a population-wide regulatory

initiative that seeks to reduce risks associated with the overconsumption of sugar and promote health.

Based on the study's findings, several recommendations emerge to address the consumption of sugar-sweetened beverages (SSBs) and mitigate their adverse health effects. Firstly, regulatory bodies in South Africa should enact stricter regulations on the marketing, advertising, and sale of SSBs. This could involve imposing restrictions on advertising targeted at vulnerable populations, such as children and adolescents, and implementing warning labels on SSB packaging to inform consumers about the health risks associated with excessive sugar consumption. By curbing the promotion of SSBs, especially to younger demographics, policymakers can help reduce overall consumption rates and mitigate the associated health risks.

Secondly, efforts should be made to promote the availability and affordability of healthier beverage alternatives, such as water, unsweetened fruit juices, and low-sugar drinks. This could include initiatives to increase access to clean drinking water in schools, workplaces, and public spaces, as well as subsidies or incentives to encourage the production and consumption of healthier beverage options. By making healthier choices more accessible and affordable, individuals may be more inclined to opt for these alternatives over SSBs, leading to a reduction in overall consumption rates.

Furthermore, healthcare professionals have a crucial role to play in raising awareness about the health risks of excessive SSB consumption and providing support for individuals looking to reduce their intake. This could involve incorporating nutrition education into routine patient consultations, offering counselling and behavioural therapy for individuals with SSB dependency, and advocating for policies that promote healthier dietary habits. By empowering individuals with knowledge and support, healthcare professionals can help facilitate behaviour change and promote healthier lifestyles.

Additionally, efforts should be made to create SSB-free environments in healthcare facilities, schools, workplaces, and other public settings. This could involve implementing policies to restrict the sale and consumption of SSBs on premises, providing alternative beverage options, and promoting water as the default choice. By creating environments that

support and encourage healthier choices, stakeholders can help shift social norms around beverage consumption and promote a culture of health and wellness.

Addressing the consumption of SSBs requires a comprehensive and multi-sectoral approach that involves collaboration between government agencies, healthcare professionals, industry stakeholders, and civil society organisations. By implementing evidence-based policies, promoting healthier alternatives, raising awareness, and providing support for individuals, South Africa can work towards reducing the burden of diet-related diseases and improving the overall health and well-being of its population.

6.3.1 Availability and Accessibility of Healthier Alternatives

The findings of this study indicated that 42% of the population was unaware of the Sugar Tax and its implications. This is despite the initial awareness efforts employed by the Government at the launch of the Sugar Tax. The key message of the dangers of overconsumption of sugar has been drowned out by the increased marketing spending by SSB manufacturers, who ultimately need to increase their market share and revenue. To address this challenge and to curb the overconsumption of SSBs, it is recommended to establish a supportive ecosystem that facilitates the availability and accessibility of nutritious food options across different settings, which is a fundamental pillar for the effectiveness of the Sugar Tax. Although the study by Nhlapo, Lues, Kativu, and Groenewald (2015) posits that schools hold a distinctive advantage in fostering healthy eating habits consumption among children, which can potentially serve as the bedrock for their dietary preferences and eating patterns in their later years as adults, Erzse et al. (2021) found that the continued presence of SSBs and advertisements within South African schools is a matter of concern. Addressing this issue may require the implementation of mandatory regulations, as well as a comprehensive engagement strategy with schools and the Department of Education to make healthier alternatives available in schools. These efforts could pave the way for healthier school environments in the future.

Furthermore, Smit et al. (2023) suggest that the provision of water and unflavoured bottled water in both school and home settings and the advocacy for more nutritious beverage options in supermarkets and on children's menus are important factors to consider in promoting a healthier lifestyle. In South Africa, school feeding programmes are widely implemented in public schools to ensure students have access to nutritious meals. Exploring

the feasibility of promoting healthier beverage options, such as water and reduced sugar alternatives, in school feeding programmes is essential. SSB manufacturers have responded to the growing demand for healthier options by introducing multiple reformulations to their product lines. These include “no sugar” or “low sugar” variations that provide consumers with healthier alternatives. It is thus recommended that schools should offer these options to encourage early adoption and foster healthy habits from an early age. By doing so, children can become accustomed to the taste and benefits of these healthier alternatives. It is, therefore, crucial to explore the feasibility of promoting healthier beverage options, such as water, in school feeding programmes. Introducing healthier drink options in school feeding programmes could improve the nutritional quality of students' diets and promote a culture of healthy eating and drinking.

6.3.2 Education and Communication Programmes – Government Intervention

Bosire et al. (2020) and the findings of this study revealed that despite the implementation of the legislation surrounding the sugar tax, there was a lack of awareness regarding the tax, thereby warranting the utilisation of multifaceted behaviour modification strategies. Media campaigns have successfully been used to alter certain behaviours that pose a risk to the population, such as curbing the spread of infectious diseases (Murukutla et al., 2020). Over the years, since the Sugar Tax was implemented, the government has made little effort to communicate and raise awareness about the harmful effects of excessive sugar consumption. Unfortunately, the minimal messaging was quickly overshadowed by the relentless advertising campaigns of SSB manufacturers.

Jou, Niederdeppe, Barry, and Gollust (2014) recommend formulating essential communication strategies and key messages aimed at health-related programs, clearly associating SSBs with health repercussions like diabetes and obesity. This can be achieved by including cultural sensitivity in messaging and imparting knowledge about the health implications of SSB consumption. The study by Farley et al. (2017) confirms that mass communication campaigns aid in changing the consumption behaviour of the population. Following a brief media campaign, they observed that participants could recall the campaign messaging and believed SSBs were accountable for heart disease and diabetes.

6.3.3 Regulation of the Retail Environment and Accessibility Restrictions

In 2010, the World Health Organisation made a declaration regarding the marketing of harmful products to minors, highlighting it as a concern of worldwide significance, and urged the Member States to undertake necessary actions in response to the issue. (Pomeranz, 2012). Boatemaa et al. (2019) argue that the risks associated with food consumption are partly due to the government's inability to effectively enforce regulations in the food sector, leading to a general lack of regulation enforcement. Primarily, the consumption of SSBs takes place in the home environment, followed by food service establishments and schools, primarily catering to children (Pomeranz, 2012). Erzse et al. (2021) found that on school premises, Coca-Cola branding or advertising was present in almost one-third of schools, with 23% of schools displaying tuck shop advertising and 10% of schools displaying advertising at their entrances.

There is a need for the Government to regulate the retail environment selling SSBs to dissuade consumers from overconsumption of SSBs. Impulsive food purchasing is commonly associated with the prominent positioning of products within a retail environment (Nakamura, Pechey, Suhrcke, Jebb, & Marteau, 2014). According to Pomeranz (2012), in the United States, the government has the authority to regulate the sale and placement of goods in retail and food service establishments, in line with their responsibility to safeguard public health, safety, and welfare. The Supreme Court has outlined various recommendations for states, the intention being to shield the public from harmful goods. These include banning the product outright, restricting the individual purchase quantity, prohibiting minors from purchasing the product, and enforcing specific sales restrictions, such as mandating that harmful products are only sold in designated areas or locations. A potential solution to address the overconsumption of SSBs in South Africa could be adopting similar regulations for the retail environment to reduce the availability and marketing of SSBs, which could, in turn, lead to a decrease in consumption. Pomeranz (2012) suggests that governments can regulate the positioning of products within retail establishments, like the implementation observed in the cases of tobacco and pharmaceuticals, where they are placed behind the sales counter and not on open shelves. A further suggestion is that a more viable alternative is to place SSBs in the back of the store and eliminate their presence from special displays and checkout aisles (Pomeranz, 2012).

6.3.4 Age Restrictions

Laws regarding age restrictions on the sale of tobacco, alcohol, and other products differ across different countries (Pomeranz, 2012). The legal alcohol drinking age in South Africa is 18 years (Parry & Dewing, 2006) and tobacco (Fagbamigbe et al., 2020). Despite the legal age for tobacco consumption in South Africa being 18 years, a recent study by Fagbamigbe et al. (2020) has revealed that the average age of tobacco initiation falls between 12 and 19 years, and they attribute this alarming trend to the influence of social media, which has been found to contribute significantly to the early onset of tobacco smoking in the country. In the United States, imposing minimum age requirements for purchasing certain beverages is legal, and in 2010, a legislator from New York suggested a prohibition on the sale of energy drinks to individuals under the age of 19 (Pomeranz, 2012).

South Africa should consider implementing age restrictions on the purchase of certain SSBs, particularly energy drinks, to promote healthier dietary habits among its citizens. Age restrictions on the sale of alcohol are in place in South Africa, and some individuals use energy drinks and other types of SSBs as mixers for alcoholic drinks. However, it is essential to note that consuming these types of beverages still carries potential health risks, especially in excessive amounts. By implementing age restrictions on the purchase of certain SSBs, including energy drinks, South Africa would be taking a proactive step towards promoting healthier lifestyle choices among its citizens.

6.3.5 Increased Investment by SSB Manufacturers in Marketing Healthier Alternatives

With the rise of health consciousness among consumers, it has become increasingly important for SSB manufacturers to prioritise marketing their healthier, low or no-sugar beverage alternatives. By investing in the promotion of such products, manufacturers will not only cater to the growing demand for healthier options but also attract a broader market. Emphasising the benefits of these products, such as their lower calorie count and reduced risk of health issues, can also encourage consumers to make more informed and health-conscious choices. With a well-executed marketing strategy, SSB manufacturers can promote their healthier beverage options and position themselves as brands that prioritise the well-being of their consumers.

6.3.6 Greater Collaboration between the Government and Healthcare Practitioners

The South African government and healthcare practitioners can collaborate to manage the issue of obesity better and enforce the implementation of a sugar tax. The government can work closely with healthcare practitioners to develop and implement effective public health campaigns that promote healthier eating habits and encourage regular physical activity. This can include education programs in schools, community centres, and healthcare facilities emphasising the importance of healthy eating habits and the dangers of consuming too much sugar. Secondly, healthcare practitioners can work closely with government and policymakers to develop policies that address the causes of obesity by driving initiatives to increase access to affordable and healthier drink alternatives and measures to promote physical activity in schools and communities.

6.4 Implications

This section discusses the practical managerial and theoretical implications of the study.

6.4.1 Managerial Implications

Managers working in companies that produce SSBs can draw some implications from the findings of this study. The revised conceptual model of the study proposes a model with regulatory interventions, an independent variable comprised of four influencers: Product Reformulation Regulation, Product Size Regulation, Price Regulation and Promotion Regulation on the Consumption Behaviour of SSBs, a dependent variable. Managers working in companies that produce SSBs need to understand the influencer that drives consumption behaviour, and the results of this study show that Product Reformulations have the most significant influence and significance on the Consumption Behaviour of SSBs. The attribute receiving the highest rating under Product Reformulations Regulations was the respondents acknowledging the health benefits associated with the decreased sugar content in a preferred SSB (mean = 5.20 ± 1.85). This acknowledgement allows managers to explore product reformulations and introduce healthier alternatives to their consumers. The focus should be on reducing the sugar content in SSBs, as it is the attribute receiving the highest rating under Product Reformulations Regulations while retaining the same taste that consumers are accustomed to.

The attribute with the lowest rating was the enjoyment of the altered taste in one's favoured sugar-sweetened beverage (mean = 3.920 ± 1.74); therefore, managers must find ways to reduce sugar content in beverages while maintaining the same level of flavour to meet consumers' expectations and preferences. This could involve experimenting with alternative sweeteners or adjusting the drink's formulation to achieve the desired taste. Ultimately, finding the right balance between taste and health will be vital to maintaining customer satisfaction and loyalty in the long run. Additionally, the findings of the study indicate that respondents recognised the expanded array of options encompassing low-sugar or sugar-free alternatives in SSBs, which received an equally high rating (mean = 5.20 ± 1.75). Therefore, the study recommends that managers consider introducing healthier alternatives in the SSB industry to meet the changing consumer demands and comply with regulatory interventions. Managers can attract health-conscious consumers and comply with regulatory interventions by acknowledging the health benefits associated with decreased sugar content in SSBs.

Furthermore, the findings of the study show that consumers are not deterred by changes or reductions in product sizes, and the attribute that received the highest rating was the willingness to persist in purchasing one's preferred SSB despite alterations in its size (mean = 5.15 ± 1.62). They are equally not deterred by the changes in the prices, although they are aware of the price changes and fluctuations. This suggests that managers can make changes to product sizes without significantly impacting consumer behaviour. However, it is important to consider other factors that may influence consumer choices, such as taste and brand loyalty. Overall, the study's findings can provide valuable insights for managers looking to optimise their product strategies.

Although the respondents acknowledged that there are low-sugar or sugar-free alternatives for one's preferred SSBs through media channels (mean = 4.94 ± 1.75), followed closely by the awareness of advertisements highlighting the hazards associated with excessive sugar consumption, these attributes have not significantly altered the Consumption Behaviour. Although the respondents acknowledged that there are low-sugar or sugar-free alternatives for one's preferred SSBs through media channels (with a mean of 4.94 ± 1.75), they also demonstrated a keen awareness of the advertisements highlighting the hazardous effects of excessive sugar consumption. Despite the efforts to spread this message, these attributes

have not yet significantly altered the consumption behaviour of SSBs. Managers can use this knowledge to better their strategies by creating more effective campaigns highlighting the benefits of low-sugar or sugar-free alternatives to SSBs.

6.4.2 Theoretical Implications

The theoretical findings of this study seek to enrich the current yet limited knowledge of regulatory interventions regarding SSBs and their influence on consumers' consumption behaviour. The research findings suggest that regulatory interventions, such as policies, should be integrated into existing frameworks and models of consumption behaviour, including the Consumer Buying Decision Model and the Consumer Behaviour Model advanced by Mothersbaugh and Hawkins (2016). This recognition of regulations as a significant external influence on consumer behaviour could enhance the understanding of consumer decision-making processes.

6.5 Limitations and Suggestions for Future Research

This section discusses the limitations and opportunities for further research that scholars can explore to advance their understanding of the subject matter.

6.5.1 Limitations of the Study

The research was exploratory, and due to the limited research on regulatory interventions' influence on the consumption behaviour of SSBs, the research did not utilise existing measurement scales. As such, the researcher developed and tested new measures that could accurately capture the impact of regulatory interventions on consumption behaviour. In analysing the data, one of the initially proposed constructs had to be discarded because it did not validate. As a result, the researcher had to revise the study's conceptual model to measure the influence of regulatory interventions on the consumption behaviour of SSBs accurately. The exploratory nature of the study, coupled with the limited availability of research on this topic, made it essential for the researcher to develop and test new measures to ensure the validity and reliability of the findings.

6.5.2 Suggestions for Future Research

For future research, efforts must delve deeper into the individual constructs that were presented in this study. Each construct can uncover valuable insights into consumption behaviour and the influence of regulations on consumption patterns and allow researchers to understand better the factors driving consumer decision-making processes. This can be done through a qualitative research approach. In particular, the construct of Product Packaging Regulation, which was discarded due to its lack of validity, warrants further refinement and independent research.

Another way to build on the findings of this study is by expanding the sample size. By increasing the number of participants, the study can yield more representative and comprehensive results. A bigger sample size will allow for more precise and accurate conclusions to be drawn.

To gain a more comprehensive understanding of respondents' behaviour, future scholars can consider utilising stratified or cluster sampling techniques that are non-random. This approach offers the advantage of monitoring the same set of respondents over an extended period, enabling researchers to gain a more accurate and in-depth understanding of their behaviour, shifts in their behaviour, and the drivers of those behaviours.

Lastly, future research can focus on different research methodologies, such as qualitative or mixed research methods, which can help uncover deeper insights into the reasons behind consumers' behaviour towards SSBs. Using these methods can help researchers obtain a more detailed and nuanced understanding of the influencers of consumption behaviour in relation to SSBs.

6.6 Conclusions

This chapter delves into the study's findings and recommendations on the sugar tax, which were discussed with different stakeholder groups. The study suggested a multi-pronged approach to reducing sugar intake, including increasing the availability and accessibility of healthier alternatives, implementing public awareness campaigns and education, and regulating the retail environment to restrict the accessibility of unhealthy drink options. In addition, the study recommended the implementation of age restrictions for the purchase of unhealthy SSBs and for SSB manufacturers to prioritise marketing their healthier

alternatives. Healthcare practitioners are urged to collaborate more closely with the Government to address the issue of excessive sugar intake and its associated health risks. Overall, the study's recommendations aim to promote healthier dietary habits and reduce the impact of unhealthy sugar consumption on public health.

7.0 REFERENCES

- Adcock, R., & Collier, D. (2001). Measurement validity: A shared standard for qualitative and quantitative research. *American political science review*, 95(3), 529-546.
- Afshin, A., Penalvo, J. L., Del Gobbo, L., Silva, J., Michaelson, M., O'Flaherty, M., . . . Mozaffarian, D. (2017). The prospective impact of food pricing on improving dietary consumption: A systematic review and meta-analysis. *PloS one*, 12(3), 1-18.
- Agyemang, C., Boatemaa, S., Frempong, G. A., & Aikins, A. (2016). Obesity in sub-saharan Africa. *Metabolic syndrome. Switzerland: Springer International Publishing*, 1(1), 1-13.
- Ailawadi, K. L., Lehmann, D. R., & Neslin, S. A. (2001). Market response to a major policy change in the marketing mix: Learning from Procter & Gamble's value pricing strategy. *Journal of marketing*, 65(1), 44-61.
- Al-Salamin, H., & Al-Hassan, E. (2016). The impact of pricing on consumer buying behavior in Saudi Arabia: Al-Hassa case study. *European Journal of Business and management*, 8(12), 62-73.
- Ali, Z., Bhaskar, S. B., & Sudheesh, K. (2019). Descriptive statistics: Measures of central tendency, dispersion, correlation and regression. *Airway*, 2(3), 120-125.
- Amalia, P., Mihaela, D., & Ionuț, P. (2012). From market orientation to the community orientation for an open public administration: A conceptual framework. *Procedia-Social and Behavioral Sciences*, 62, 871-875.
- Amaral, J. V., & Guerreiro, R. (2019). Factors explaining a cost-based pricing essence. *Journal of Business & Industrial Marketing*, 34 (8), 1850-1865.
- Andreyeva, T., Marple, K., Marinello, S., Moore, T. E., & Powell, L. M. (2022). Outcomes following taxation of sugar-sweetened beverages: a systematic review and meta-analysis. *JAMA Network Open*, 5(6), 1-18.
- Anojan, V. (2015). Consumers preference and consumers buying behavior on soft drinks: A case study in Northern Province of Sri Lanka. *Global Journal of Management and Business Research*, 15(2), 11-33.
- Attanasio, O. (1999). Consumption. Handbook of macroeconomics. *Science Direct*, 1, 741-812.
- Backholer, K., Sarink, D., Beauchamp, A., Keating, C., Loh, V., Ball, K., . . . Peeters, A. (2016). The impact of a tax on sugar-sweetened beverages according to socio-economic position: A systematic review of the evidence. *Public health nutrition*, 19(17), 3070-3084.
- Bagozzi, R. P., & Yi, Y. (2012). Specification, evaluation, and interpretation of structural equation models. *Journal of the academy of marketing science*, 40, 8-34.

- Baker, P., Gill, T., Friel, S., Carey, G., & Kay, A. (2017). Generating political priority for regulatory interventions targeting obesity prevention: An Australian case study. *Social science & medicine*, 177, 141-149.
- Benade, J., & Faadiel, E. (2017). Introduction of " Sugar Tax" in South Africa: Placebo or panacea to curb the onset of cardio-metabolic diseases? *SA Heart*, 14(3), 148-153.
- Bercholz, M., Ng, S. W., Stacey, N., & Swart, E. C. (2022). Decomposing consumer and producer effects on sugar from beverage purchases after a sugar-based tax on beverages in South Africa. *Economics & Human Biology*, 46, 1-46.
- Bharadwaj, B., Baland, J. M., & Nepal, M. (2020). What makes a ban on plastic bags effective? The case of Nepal. *Environment and Development Economics*, 25(2), 95-114.
- Bin Abdul Lasi, M., & Salim, S. M. (2020). The relationship between e-marketing mix strategy and integrated marketing communication: A conceptual framework. *Int J Eng Appl Sci*, 5(6), 40-48.
- Birmingham, P., & Wilkinson, D. (2003). *Using research instruments: A guide for researchers* (1st ed.). London: Routledge.
- Block, J. P., Chandra, A., McManus, K. D., & Willett, W. C. (2010). Point-of-purchase price and education intervention to reduce consumption of sugary soft drinks. *American journal of public health*, 100(8), 1427-1433.
- Blundell, R. (1988). Consumer behaviour: Theory and empirical evidence—a survey. *The economic journal*, 98(389), 16-65.
- Boachie, M. K., Goldstein, S., Kruger, P., Ng, S. W., Hofman, K. J., & Thsehla, E. (2023). Beverage industry's advertising expenditures and airtimes in South Africa from 2013 to 2019 target children and families. *Journal of Public Health Research*, 12(2), 1-13.
- Boachie, M. K., Thsehla, E., & Hofman, K. (2022). New developments with the Health Promotion Levy in South Africa. *112*(7), 454-455.
- Boatema, S., Barney, M., Drimie, S., Harper, J., Korsten, L., & Pereira, L. (2019). Awakening from the listeriosis crisis: Food safety challenges, practices and governance in the food retail sector in South Africa. *Food Control*, 104(1), 333-342.
- Bopape, M., Taillie, L. S., Frank, T., Murukutla, N., Cotter, T., Majija, L., & Swart, R. (2021). South African consumers' perceptions of front-of-package warning labels on unhealthy foods and drinks. *PloS one*, 16(9), 1-20.
- Borden, N. H. (1964). The concept of the marketing mix. *Journal of advertising research*, 4(2), 2-7.
- Bosire, E., Stacey, N., Mukoma, G., Tugendhaft, A., Hofman, K., & Norris, S. (2020). Attitudes and Perceptions Among Urban South Africans Towards Sugar-Sweetened Beverages and Taxation *Public health nutrition*, 23(2), 374-383.

- Bradley, E. L., Castle, L., & Chaudhry, Q. (2011). Applications of nanomaterials in food packaging with a consideration of opportunities for developing countries. *Trends in food science & technology*, 22(11), 604-610.
- Bray, J. P. (2008). Consumer behaviour theory: Approaches and models. In.
- Breda, J. J., Whiting, S. H., Encarnação, R., Norberg, S., Jones, R., Reinap, M., & Jewell, J. (2014). Energy drink consumption in Europe: A review of the risks, adverse health effects, and policy options to respond. *Frontiers in public health*, 2, 134.
- Brennan, J. G., & Grandison, A. S. (2012). *Food processing handbook*. Germany: Wiley-VCH.
- Bruner, G. C. (1989). The marketing mix: Time for reconceptualization. *Journal of marketing education*, 11(2), 72-77.
- Capewell, S., & Lloyd-Williams, F. (2018). The role of the food industry in health: Lessons from tobacco? *British medical bulletin*, 125(1), 131-143.
- Chatterjee, S., & Hadi, A. S. (2013). *Regression analysis by example* (5th ed.). New Jersey: John Wiley & Sons.
- Cleghorn, C., Blakely, T., Mhurchu, C. N., Wilson, N., Neal, B., & Eyles, H. (2019). Estimating the health benefits and cost-savings of a cap on the size of single serve sugar-sweetened beverages. *Preventive Medicine*, 120, 150-156.
- Colchero, M. A., Popkin, B. M., Rivera, J. A., & Ng, S. W. (2016). Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study. *BMJ*, 1(1), 1-9.
- Constantinides, E. (2006). The Marketing Mix Revisited: Towards the 21st Century Marketing. *Journal of Marketing Management*, 22, 407-438.
- Cooper, R., & Schindler, P. (2014). *Business Research Methods* (Vol. 12). New York: McGraw-Hill Irwin.
- Creswell, J. W. (2014). *Qualitative, quantitative and mixed methods approaches* (Fourth ed.). London: Sage.
- Crino, M., Mantilla Herrera, A. M., Ananthapavan, J., Wu, J. H., Neal, B., Lee, Y. Y., . . . Sacks, G. (2017). Modelled cost-effectiveness of a package size cap and a kilojoule reduction intervention to reduce energy intake from sugar-sweetened beverages in Australia. *Nutrients*, 9(9), 1-17.
- Crockett, R. A., King, S. E., Marteau, T. M., Prevost, A. T., Bignardi, G., Roberts, N. W., . . . Jebb, S. A. (2018). Nutritional labelling for healthier food or non-alcoholic drink purchasing and consumption. *Cochrane database of systematic reviews*(2), 1-106.
- Davcik, N. S., & Sharma, P. (2015). Impact of product differentiation, marketing investments and brand equity on pricing strategies: A brand level investigation. *European Journal of Marketing*, 49(5/6), 760-781.

- Department of Labour. (2023). The National Minimum Wage. Retrieved 05 December 2023 from <https://www.labour.gov.za/DocumentCenter/Publications/Basic%20Conditions%20of%20Employment/National%20Minimum%20Wage%20-%20Wage%20increase%202023%20flyer.pdf>
- Dikgang, J., & Visser, M. (2012). Behavioural response to plastic bag legislation in Botswana. *South African Journal of Economics*, 80(1), 123-133.
- Dolgui, A., & Proth, J. M. (2010). Pricing strategies and models. *Annual Reviews in Control*, 34(1), 101-110.
- Dominic, C. A., Östlund, S., Buffington, J., & Masoud, M. M. (2015). Towards a conceptual sustainable packaging development model: A corrugated box case study. *Packaging Technology and Science*, 28(5), 397-413.
- Draganska, M., & Jain, D. C. (2006). Consumer preferences and product-line pricing strategies: An empirical analysis. *Marketing Science*, 25(2), 164-174.
- East, R., Singh, J., Wright, M., & Vanhuele, M. (2016). *Consumer Behaviour: Applications in Marketing*. Sage.
- Ehrnrooth, H., & Gronroos, C. (2013). The Hybrid Consumer: Exploring Hybrid Consumption Behaviour. *Management Decision*, 51(9), 1793-1820.
- Engel, J. F., Blackwell, R. D., & Miniard, P. W. (1995). *Consumer behavior*. Florida. Dryden: International ed.
- Erasmus, A. C., Boshoff, E., & Rousseau, G. G. (2001). Consumer decision-making models within the discipline of consumer science: A critical approach. *Journal of Consumer Sciences*, 29, 82-90.
- Erzse, A., Christofides, N., Stacey, N., Lebard, K., Foley, L., & Hofman, K. (2021). Availability and advertising of sugar sweetened beverages in South African public primary schools following a voluntary pledge by a major beverage company: a mixed methods study. *Global Health Action*, 14(1), 1-12.
- Essman, M., Taillie, L. S., Frank, T., Ng, S. W., Popkin, B. M., & Swart, E. C. (2021). Taxed and untaxed beverage intake by South African young adults after a national sugar-sweetened beverage tax: A before-and-after study. *PLOS Medicine* 18, 18(5), 1-17.
- Essman, M., Zimmer, C., Carpentier, F. D., Swart, E. C., & Taillie, L. S. (2022). Are intentions to change, policy awareness, or health knowledge related to changes in dietary intake following a sugar-sweetened beverage tax in South Africa? A before-and-after study. *International Journal of Behavioral Nutrition and Physical Activity*, 19(1), 1-11.
- Etikan, I., Alkassim, R., & Abubakar, S. (2016). Comparison of snowball sampling and sequential sampling technique. *Biometrics and Biostatistics International Journal*, 3(1), 55.

- Etikan, I., & Bala, K. (2017). Sampling and sampling methods. *Biometrics & Biostatistics International Journal*, 5(6), 215-217.
- Euromonitor International. (2022). Soft Drinks Definitions. Retrieved 2nd December, 2022 from <https://www.euromonitor.com/definitions?categoryContentId=1073782173>
- Eyles, H., Ni Mhurchu, C., Nghiem, N., & Blakely, T. (2012). Food pricing strategies, population diets, and non-communicable disease: A systematic review of simulation studies. *PLoS medicine*, 9(12), 1-22.
- Fagbamigbe, A. F., Desai, R., Sewpaul, R., Kandala, N. B., Sekgala, D., & Reddy, P. (2020). Age at the onset of tobacco smoking in South Africa: a discrete-time survival analysis of the prognostic factors. *Archives of Public Health*, 78(128), 1-11.
- Faith, D. O. (2018). A review of the effect of pricing strategies on the purchase of consumer goods. *International Journal of Research in Management, Science & Technology*, 2(2), 88-102.
- Farley, T. A., Halper, H. S., Carlin, A. M., Emmerson, K. M., Foster, K. N., & Fertig, A. R. (2017). Mass media campaign to reduce consumption of sugar-sweetened beverages in a rural area of the United States. *American journal of public health*, 107(6), 989-995.
- Fenko, A., Nicolaas, I., & Galetzka, M. (2018). Does attention to health labels predict a healthy food choice? An eye-tracking study. *Food quality and preference*, 69, 57-65.
- Foxall, G. R. (2001). Foundations of consumer behaviour analysis. *Marketing theory*, 1(2), 165-199.
- Ghose, P., & Nair, P. (2013). Packaging of carbonated beverages. *Int. J. Agric. Food Sci. Technol*, 4(5), 421-430.
- Gittelsohn, J., Trude, A. C. B., & Kim, H. (2017). Peer reviewed: Pricing strategies to encourage availability, purchase, and consumption of healthy foods and beverages: a systematic review. *Preventing chronic disease*, 14, 1-24.
- Gonzalez Viejo, C., Torrico, D. D., Dunshea, F. R., & Fuentes, S. (2019). Bubbles, Foam Formation, Stability and Consumer Perception of Carbonated Drinks: A Review of Current, New and Emerging Technologies for Rapid Assessment and Control. *Foods*, 8(12), 596.
- Göx, R. F. (2001). The impact of cost-based pricing rules on capacity planning under uncertainty. *Schmalenbach Business Review*, 53(3), 197-228.
- Grunert, K. (2017). *The health Trend: Consumer Trends and New Product Opportunities in the Food Sector*. Netherlands: Wageningen Academic Publishers.
- Gupta, K., & Singh, N. (2020). *Consumption Behaviour and Social Responsibility*. Singapore: Springer Nature.

- Hagenaars, L. L., Jeurissen, P. P. T., & Klazinga, N. S. (2017). The taxation of unhealthy energy-dense foods (EDFs) and sugar-sweetened beverages (SSBs): an overview of patterns observed in the policy content and policy context of 13 case studies. *Health Policy*, 121(8), 887-894.
- Hayakawa, H. (2017). Health-conscious consumer behavior. *Eurasian Economic Review*, 7(1), 1-31.
- Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-based nursing*, 18(3), 66-67.
- Hinterhuber, A. (2008). Customer value-based pricing strategies: Why companies resist. *Journal of business strategy*, 29(4), 41-50.
- Hinterhuber, A., & Liozu, S. (2012). Is it time to rethink your pricing strategy. *MIT Sloan management review*, 53(4), 69-77.
- Hofman, K. J., Stacey, N., Swart, E. C., Popkin, B. M., & Ng, S. W. (2021). South Africa's Health Promotion Levy: Excise tax findings and equity potential. *Obesity Reviews*, 22(9), 1-7.
- Hollands, G. J., Shemilt, I., Marteau, T. M., Jebb, S. A., Lewis, H. B., Wei, Y., . . . Ogilvie, D. (2015). Portion, package or tableware size for changing selection and consumption of food, alcohol and tobacco. *Cochrane database of systematic reviews*(9), 1-310.
- Houghtaling, B., Holston, D., Szocs, C., Penn, J., Qi, D., & Hedrick, V. (2021). A rapid review of stocking and marketing practices used to sell sugar-sweetened beverages in US food stores. *Obesity Reviews*, 22(4), 1-29.
- Igumbor, E. U., Sanders, D., Puoane, T. R., Tsolekile, L., Schwarz, C., Purdy, C., . . . Hawkes, C. (2012). "Big food," the consumer food environment, health, and the policy response in South Africa. *PLoS medicine*, 9(7), 1-7.
- Jacoby, J. (2002). Stimulus-organism-response reconsidered: an evolutionary step in modeling (consumer) behavior. *Journal of consumer psychology*, 12(1), 51-57.
- James, E., Lajous, M., & Reich, M. (2020). The politics of taxes for health: An analysis of the passage of the sugar-sweetened beverage tax in Mexico. *Health Systems & Reform*, 6(1), 1-12.
- Jefferson, K., Semnani-Azad, Z., Wong, C., L'Abbé, M. R., & Arcand, J. (2019). Changing Sodium Knowledge, Attitudes and Intended Behaviours Using Web-Based Dietary Assessment Tools: A Proof-Of-Concept Study. *Nutrients*, 11(9), 1-9.
- Jepson, R. G., Harris, F. M., Platt, S., & Tannahill, C. (2010). The effectiveness of interventions to change six health behaviours: A review of reviews. *BMC public health*, 10(1), 1-16.
- Jisana, T. (2014). Consumer behaviour models: An overview. *Sai Om Journal of Commerce & Management*, 1(5), 34-43.

- Jones, R., Pykett, J., & Whitehead, M. (2013). *Changing behaviours: On the rise of the psychological state*: Edward Elgar Publishing.
- Jou, J., Niederdeppe, J., Barry, C. L., & Gollust, S. E. (2014). Strategic messaging to promote taxation of sugar-sweetened beverages: lessons from recent political campaigns. *American journal of public health*, 104(5), 847-853.
- Junior, W. J. F. L., dos Reis, L. P. d. A., de Oliveira, V. S., Lopes, L. O., & Pereira, K. S. (2019). Reuse of refillable PET packaging: Approaches to safety and quality in soft drink processing. *Food Control*, 100, 329-334.
- Kader, G., & Franklin, C. (2008). The evolution of Pearson's correlation coefficient. *The Mathematics Teacher*, 102(4), 292-299.
- Kardes, F., Cronley, M., & Cline, T. (2014). *Consumer behavior* (2nd ed.). Stamford: Cengage Learning.
- Kaur, P., Stoltzfus, J., & Yellapu, V. (2018). Descriptive statistics. *International Journal of Academic Medicine*, 4(1), 60-63.
- Kersbergen, I., & Field, M. (2017). Alcohol consumers' attention to warning labels and brand information on alcohol packaging: Findings from cross-sectional and experimental studies. *BMC public health*, 17(1), 1-11.
- Khaldi, K. (2017). Quantitative, qualitative or mixed research: Which research paradigm to use? *Journal of Educational and Social Research*, 7(2), 15-15.
- Khan, M. T. (2014). The concept of 'marketing mix' and its elements. *International journal of information, business and management*, 6(2), 95-107.
- Kim, T. K. (2017). Understanding one-way ANOVA using conceptual figures. *Korean journal of anesthesiology*, 70(1), 22-26.
- Kivunja, C., & Kuyini, A. B. (2017). Understanding and applying research paradigms in educational contexts. *International Journal of higher education*, 6(5), 26-41.
- Kloss, L., Meyer, J. D., Graeve, L., & Vetter, W. (2015). Sodium intake and its reduction by food reformulation in the European Union—A review. *NFS journal*, 1, 9-19.
- Kotler, P. (2003). *Marketing Management* (11 ed.). New Jersey: Prentice Hall International Editions
- Kotler, P., & Keller, K. L. (2012). *Marketing Management* (14 ed.). New Jersey: Prentice Hall.
- Lehner, M., Mont, O., & Heiskanen, E. (2016). Nudging—A promising tool for sustainable consumption behaviour? *Journal of Cleaner Production*, 134, 166-177.
- Liu, Y. Z., Lopez, R. A., & Zhu, C. (2013). How effective is public policy in decreasing soda consumption? An assessment of four policy options. *Working Paper Series-Charles J. Zwick Center for Food and Resource Policy, Department of Agricultural*

and Resource Economics, College of Agriculture and Natural Resources, University of Connecticut(19), 1-19.

- Londhe, B. R. (2014). Marketing mix for next generation marketing. *Procedia Economics and Finance*, 11, 335-340.
- Madhavan, M., & Kaliyaperumal, C. (2015). Consumer buying behavior-an overview of theory and models. *St. Theresa Journal of Humanities and Social Sciences*, 1(1), 74-112.
- Mantzari, E., Hollands, G. J., Pechey, R., Jebb, S., & Marteau, T. M. (2017). Impact of bottle size on in-home consumption of sugar-sweetened beverages: a feasibility and acceptability study. *BMC public health*, 17(1), 1-6.
- Mantzari, E., Vasiljevic, M., Turney, I., Pilling, M., & Marteau, T. (2018). Impact of warning labels on sugar-sweetened beverages on parental selection: An online experimental study. *Preventive medicine reports*, 12, 259-267.
- Manyema, M., Veerman, L. J., Tugendhaft, A., Labadarios, D., & Hofman, K. J. (2016). Modelling the potential impact of a sugar-sweetened beverage tax on stroke mortality, costs and health-adjusted life years in South Africa. *BMC public health*, 16(1), 1-10.
- Marczyk, G. R., DeMatteo, D., & Festinger, D. (2010). *Essentials of research design and methodology* (Vol. 2). Canada: John Wiley & Sons.
- Marsh, K., & Bugusu, B. (2007). Food packaging—roles, materials, and environmental issues. *Journal of food science*, 72(3), 39-55.
- Marteau, T. M., Hollands, G. J., Shemilt, I., & Jebb, S. A. (2015). Downsizing: Policy options to reduce portion sizes to help tackle obesity. *BMJ*, 351, 1-5.
- Marteau, T. M., Oliver, A., & Ashcroft, R. E. (2008). Changing behaviour through state intervention. *BMJ: British Medical Journal* 337, 121-122.
- McMillan, G. P., & Lapham, S. (2006). Effectiveness of bans and laws in reducing traffic deaths: legalized Sunday packaged alcohol sales and alcohol-related traffic crashes and crash fatalities in New Mexico. *American journal of public health*, 96(11), 1944-1948.
- Mertens, W., Amedeo, P., & Jan, R. (2017). *Quantitative data analysis*. Switzerland: Springer International Publishing
- Michie, S., Atkins, L., & West, R. (2014). *The Behaviour Change Wheel. A Guide to Designing Interventions* (1 ed.). United Kingdom: Silverback Publishing.
- Middleton, J. C., Hahn, R. A., Kuzara, J. L., Elder, R., Brewer, R., Chattopadhyay, S., . . . Lawrence, B. (2010). Effectiveness of policies maintaining or restricting days of alcohol sales on excessive alcohol consumption and related harms. *American journal of preventive medicine*, 39(6), 575-589.

- Mohebbi, B. (2014). The art of packaging: An investigation into the role of color in packaging, marketing, and branding. *International journal of organizational leadership*, 3, 92-102.
- Mohiuddin, S. M., Mooss, A. N., Hunter, C. B., Grollmes, T. L., & Cloutier, D. A. (2007). Intensive Smoking Cessation Intervention Reduces Mortality in High-Risk Smokers With Cardiovascular. *CHEST*, 131(2), 446-452.
- Mothersbaugh, D., & Hawkins, D. (2016). *Consumer Behaviour: Building Marketing Strategy* (13 ed.): Boston: McGraw-Hill.
- Munthiu, M. C. (2009). The buying decision process and types of buying decision behaviour. *Sibiu Alma Mater University Journals. Series A. Economic Sciences*, 2(4), 27-33.
- Murukutla, N., Cotter, T., Wang, S., Cullinan, K., Gaston, F., Kotov, A., . . . Mullin, S. (2020). Results of a mass media campaign in South Africa to promote a sugary drinks tax. *Nutrients*, 12(6), 1878.
- Mweshi, G. K., & Sakyi, K. (2020). Application of sampling methods for the research design. *Archives of Business Review–Vol*, 8(11), 1-14.
- Myers, A., Fig, D., Tugendhaft, A., Mandle, J., Myers, J., & Hofman, K. (2015). Sugar and Health in South Africa: Potential Challenges to Leveraging Policy Change. *Global Public Health.*, 12(1), 98-115.
- Nakamura, R., Pechey, R., Suhrcke, M., Jebb, S. A., & Marteau, T. M. (2014). Sales impact of displaying alcoholic and non-alcoholic beverages in end-of-aisle locations: an observational study. *Social science & medicine*, 108, 68-73.
- Netseva-Porcheva, T., & Bozev, V. (2020). Research on the Relation Between Company Pricing Objectives and Pricing Strategies. *Economic Studies journal*(5), 99-123.
- Ng, S. W., Rivera, J. A., Popkin, B. M., & Colchero, M. A. (2019). Did high sugar-sweetened beverage purchasers respond differently to the excise tax on sugar-sweetened beverages in Mexico? *Public health nutrition*, 22(4), 750-756.
- Nhlapo, N., Lues, R. J. F., Kativu, E., & Groenewald, W. H. (2015). Assessing the quality of food served under a South African school feeding scheme: A nutritional analysis. *South African Journal of Science*, 111(1-2), 01-09.
- Nilsson, J., & Öström, T. (2005). *Packaging as a brand communication vehicle*. (Masters Thesis). Luleå University of Technology, Sweden.
- Nunez, E., Steyerberg, E. W., & Nunez, J. (2011). Regression modeling strategies. *Revista Española de Cardiología (English Edition)*, 64(6), 501-507.
- Nuseir, M. T., & Madanat, H. (2015). 4Ps: A strategy to secure customers' loyalty via customer satisfaction. *International journal of marketing studies*, 7(4), 78.
- Obesity Evidence Hub. (2022, 17 Mar 2022). Countries that have taxes on sugar-sweetened beverages (SSBs). Retrieved 9th November, 2022 from

<https://www.obesityevidencehub.org.au/collections/prevention/countries-that-have-implemented-taxes-on-sugar-sweetened-beverages-ssbs#:~:text=Over%2050%20countries%20have%20implemented,SSBs%20has%20been%20extensively%20studied.>

- Owobi, O. U., Okonji, O. C., Nzoputam, C. I., & Ekholuenetale, M. (2022). Country-Level Variations in Overweight and Obesity among Reproductive-Aged Women in Sub-Saharan Countries. *Women*, 2(4), 313-325.
- Palmatier, R., & Sridhar, S. (2017). *Marketing Strategy Based on First Principles and Data Analytics*. New York: Macmillan Publishers Limited.
- Parry, C. D. H., & Dewing, S. (2006). A public health approach to addressing alcohol-related crime in South Africa. *African Journal of Drug and Alcohol Studies*, 5(1), 41-56.
- Pearson, T. A., Palaniappan, L. P., Artinian, N. T., Carnethon, M. R., Criqui, M. H., Daniels, S. R., . . . Galloway, J. M. (2013). American Heart Association Guide for Improving Cardiovascular Health at the Community Level, 2013 update: a scientific statement for public health practitioners, healthcare providers, and health policy makers. *Circulation*, 127(16), 1730-1753.
- Piekara, A. (2022). Sugar Tax or What? The Perspective and Preferences of Consumers. *International Journal of Environmental Research and Public Health*, 19(19), 118-120.
- Plinke, W. (1985). Cost-based pricing: Behavioral aspects of price decisions for capital goods. *Journal of Business Research*, 13(5), 447-460.
- Pomeranz, J. L. (2012). Advanced policy options to regulate sugar-sweetened beverages to support public health. *Journal of Public Health Policy*, 33(1), 75-88.
- Popova, L., Nonnemaker, J., Taylor, N., Bradfield, B., & Kim, A. (2019). Warning labels on sugar-sweetened beverages: An eye tracking approach. *American journal of health behavior*, 43(2), 406-419.
- Rafiq, M., & Ahmed, P. K. (1995). Using the 7Ps as a generic marketing mix: An exploratory survey of UK and European marketing academics. *marketing intelligence & planning*, 13(9), 4-15.
- Ramya, N., & Ali, M. (2016). Factors Affecting Consumer Buying behaviour. *International journal of applied research.*, 2(10), 76-80.
- Reddy, P., Zuma, K., Shisana, O., Jonas, K., & Sewpaul, R. (2015). Prevalence of tobacco use among adults in South Africa: Results from the first South African National Health and Nutrition Examination Survey. *South African Medical Journal*, 105(8), 648-655.
- Research and Markets. (2021, January 2021). Carbonated Soft Drinks in South Africa - Market Summary, Competitive Analysis and Forecast to 2024. Retrieved 3rd December, 2022 from

- Roberto, C. A., Lawman, H. G., LeVasseur, M. T., Mitra, N., Peterhans, A., Herring, B., & Bleich, S. N. (2019). Association of a beverage tax on sugar-sweetened and artificially sweetened beverages with changes in beverage prices and sales at chain retailers in a large urban setting. *Jama*, 321(18), 1799-1810.
- Roberto, C. A., Wong, D., Musicus, A., & Hammond, D. (2016). The influence of sugar-sweetened beverage health warning labels on parents' choices. *Pediatrics*, 137(2), 1-12.
- Ronquest-Ross, L. C., Vink, N., & Sigge, G. O. (2015). Food consumption changes in South Africa since 1994. *South African Journal of Science*, 111(9-10), 1-12.
- S, A. K., Kruger, P., & Hofman, K. (2020). Industry strategies in the parliamentary process of adopting a sugar-sweetened beverage tax in South Africa: a systematic mapping. *Globalization and health*, 16(1), 1-14.
- Saltmarsh, M., & Saltmarsh, M. (2013). *Essential guide to food additives* (4th ed.). Cambridge: Royal Society of Chemistry.
- Sammut-Bonnici, T., & Channon, D. F. (2014). Pricing strategy. *Wiley Encyclopedia of Management*, 1-3.
- Sanchez-Ramirez, D. C., & Voaklander, D. (2018). The impact of policies regulating alcohol trading hours and days on specific alcohol-related harms: a systematic review. *Injury prevention*, 24(1), 94-100.
- Sandoval, L. A., Carpio, C. E., & Sanchez-Plata, M. (2019). The effect of 'Traffic-Light' nutritional labelling in carbonated soft drink purchases in Ecuador. *PloS one*, 14(10), 1-18.
- Santos, J. A., Tekle, D., Rosewarne, E., Flexner, N., Cobb, L., Al-Jawaldeh, A., . . . Campbell, N. (2021). A systematic review of salt reduction initiatives around the world: a midterm evaluation of progress towards the 2025 global non-communicable diseases salt reduction target. *Advances in Nutrition*, 12(5), 1768-1780.
- Saunders, M., & Lewis, P. (2018). *Doing Research in Business and Management An Essential Guide to Planning your Project* (2nd ed.). United Kingdom: Pearson Education Limited.
- Scarborough, P., Adhikari, V., Harrington, R. A., Elhussein, A., Briggs, A., Rayner, M., . . . White, M. (2020). Impact of the announcement and implementation of the UK Soft Drinks Industry Levy on sugar content, price, product size and number of available soft drinks in the UK, 2015-19: A controlled interrupted time series analysis. *PLoS medicine*, 17(2), 1-19.
- Schindler, P. (2019). *Business Research Methods* (13th ed.). New York: McGraw-Hill.
- Schnettler, B., Ares, G., Sepúlveda, N., Bravo, S., Villalobos, B., Hueche, C., & Adasme-Berríos, C. (2019). How do consumers perceive reformulated foods after the

- implementation of nutritional warnings? Case study with frankfurters in Chile. *Food quality and preference*, 74, 179-188.
- Schober, P., Boer, C., & Schwarte, L. A. (2018). Correlation coefficients: appropriate use and interpretation. *Anesthesia & analgesia*, 126(5), 1763-1768.
- Scholes-Balog, K. E., Heerde, J. A., & Hemphill, S. A. (2012). Alcohol warning labels: Unlikely to affect alcohol-related beliefs and behaviours in adolescents. *Australian and New Zealand journal of public health*, 36(6), 524-529.
- Sekaran, U., & Bougie, R. (2013). *Research methods for Business: A skill building approach* (6th ed.): John Wiley and Sons Ltd.
- Shams, M., Mohebi, F., Gohari, K., Masinaei, M., Mohajer, B., Rezaei, N., . . . Hasan, M. (2021). The level and trend of road traffic injuries attributable mortality rate in Iran, 1990–2015: A story of successful regulations and a roadmap to design future policies. *BMC public health*, 21(1), 1-12.
- Shankar, V., & Bolton, R. N. (2004). An empirical analysis of determinants of retailer pricing strategy. *Marketing Science*, 23(1), 28-49.
- Sharma, A., Sinha, K., & Vandenberg, B. (2017). Pricing as a means of controlling alcohol consumption. *British medical bulletin*, 123(1), 149-158.
- Sharma, G. (2017). Pros and cons of different sampling techniques. *International journal of applied research*, 3(7), 749-752.
- Shrestha, N. (2021). Factor analysis as a tool for survey analysis. *American Journal of Applied Mathematics and Statistics*, 9(1), 4-11.
- Silver, L. D., Ng, S. W., Ryan-Ibarra, S., Taillie, L. S., Induni, M., Miles, D. R., . . . Popkin, B. M. (2017). Changes in prices, sales, consumer spending, and beverage consumption one year after a tax on sugar-sweetened beverages in Berkeley, California, US: A before-and-after study. *PLoS medicine*, 14(4), 1-19.
- Siswantoro, J. (2019). Application of color and size measurement in food products inspection. *Indonesian Journal of Information Systems (IJIS)*, 1(2), 90-107.
- Smit, Y., Ebrahim, Z., Marais, M., Nel, D., & Koen, N. (2023). Does sugar taxation on sugar-sweetened beverages alter purchasing behaviour of South African consumers? Perspectives of dietitians and key industry role-players. *South African journal of clinical nutrition*(1), 1-8.
- Smit, Y., Ebrahim, Z., Marais, M., Nel, D., & Koen, N. (2024). Does sugar taxation on sugar-sweetened beverages alter purchasing behaviour of South African consumers? Perspectives of dietitians and key industry role-players. *South African journal of clinical nutrition*, 37(2), 53-60.
- Solomon, M., Russell-Bennett, R., & Previte, J. (2012). *Consumer Behaviour* (3rd ed.). Australia: Pearson Higher Education AU.

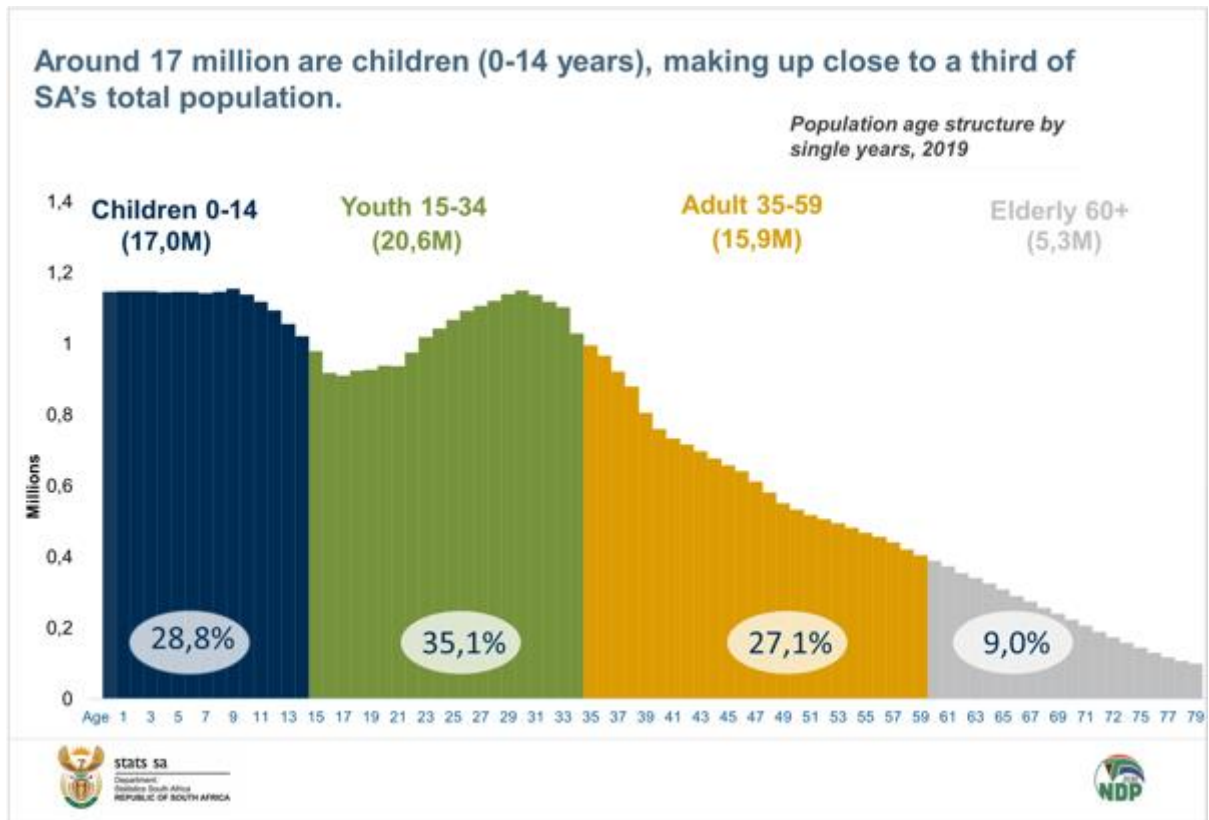
- South African Government. (2005). Children's Act 38 of 2005. Retrieved 16th December, 2022 from <https://www.gov.za/documents/childrens-act>
- South African Revenue Services. (2021). Health Promotion Levy on Sugary Beverages. . Retrieved 10th November, 2021 from <https://www.sars.gov.za/customs-and-excise/excise/health-promotion-levy-on-sugary-beverages/>
- Spires, M., Delobelle, P., Sanders, D., Puoane, T., Hoelzel, P., & Swart, R. (2016). Diet-related non-communicable diseases in South Africa: Determinants and policy responses. *South African Health Review*, 2016(1), 35-42.
- Stacey, N., Edoka, I., Hofman, K., Swart, E. C., Popkin, B. M., & Ng, S. W. (2021). Changes in beverage purchases following the announcement and implementation of South Africa's Health Promotion Levy: an observational study. *The Lancet Planetary Health*, 5(4), 200-208.
- Stacey, N., Mudara, C., Ng, S. W., van Walbeek, C., Hofman, K., & Edoka, I. (2019). Sugar-based beverage taxes and beverage prices: Evidence from South Africa's Health Promotion Levy. *Social science & medicine*, 238, 1-8.
- Stacey, N., van Walbeek, C., Maboshe, M., Tugendhaft, A., & Hofman, K. (2017). Energy drink consumption and marketing in South Africa. *Preventive Medicine*, 105, 32-36.
- Ståhl, J.-E., Windmark, C., & Kianian, B. (2018). Cost-based pricing for learning organizations—a model presentation and demonstration. *Procedia Manufacturing*, 25, 239-246.
- Statista. (2022). Soft Drinks - South Africa. Retrieved 2nd December, 2022 from <https://www.statista.com/outlook/cmo/non-alcoholic-drinks/soft-drinks/south-africa#price>
- Statistics South Africa. (2019). SA population reaches 58,8 million. Retrieved 13th October, 2021 from <https://www.statssa.gov.za/?p=12362>
- Steen, D., & Ashurst, P. R. (2008). *Carbonated soft drinks: formulation and manufacture*. New Jersey: John Wiley & Sons.
- Steenhuis, I. H. M., Waterlander, W. E., & De Mul, A. (2011). Consumer food choices: the role of price and pricing strategies. *Public health nutrition*, 14(12), 2220-2226.
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, 2, 53-55
- Temple, N. J., & Steyn, N. P. (2013). Sugar and health: A food-based dietary guideline for South Africa. *South African journal of clinical nutrition*, 26, 100-104.
- The Department of National Treasury of South Africa. (2016). Taxation Of Sugar Sweetened Beverages. Retrieved 15th May, 2021 from https://www.gov.za/sites/default/files/gcis_document/201608/policy-paper-and-proposal-taxation-sugar-sweetened-beverages.pdf

- Theofanidis, D., & Fountouki, A. (2018). Limitations and delimitations in the research process. *Perioperative Nursing-Quarterly scientific, online official journal of GORNA*, 7(1), 155-163.
- Trienekens, J., & Zuurbier, P. (2008). Quality and safety standards in the food industry, developments and challenges. *International journal of production economics*, 113(1), 107-122.
- Trieu, K., Neal, B., Hawkes, C., Dunford, E., Campbell, N., Rodriguez-Fernandez, R., . . . Webster, J. (2015). Salt reduction initiatives around the world—a systematic review of progress towards the global target. *PloS one*, 10(7), 1-22.
- Tugendhaft, A., Manyema, M., Veerman, L. J., Chola, L., Labadarios, D., & Hofman, K. J. (2016). Cost of inaction on sugar-sweetened beverage consumption: implications for obesity in South Africa. *Public health nutrition*, 19(13), 2296-2304.
- Ubeja, S., & Patel, R. (2014). Consumer preference towards soft drinks: a perceptual study. *Pacific business review international*, 6(9), 80-86.
- Van Teijlingen, E., & Hundley, V. (2001). The importance of pilot studies. *Social research update*(35), 1-4.
- Van Waterschoot, W., & Van den Bulte, C. (1992). The 4P classification of the marketing mix revisited. *Journal of marketing*, 56(4), 83-93.
- Veerman, J. L., Sacks, G., Antonopoulos, N., & Martin, J. (2016). The impact of a tax on sugar-sweetened beverages on health and health care costs: A modelling study. *PloS one*, 11(4), 1-10.
- Velicer, W. F., Prochaska, J. O., Rossi, J., S, & Snow, M., G. (1992). Assessing Outcome in Smoking Cessation Studies. *Psychological Bulletin*, 111(1), 23-41.
- Vorster, H. H., Badham, J. B., & Venter, C. S. (2013). An introduction to the revised food-based dietary guidelines for South Africa. *South African journal of clinical nutrition*, 26, 5-12.
- Wagner, C., Kawulich, B., & Garner, M. (2012). *Doing social research: A global context* (1st ed.). Berkshire: McGraw Hill.
- Watkins, M. W. (2018). Exploratory Factor Analysis: A Guide to Best Practice. *Journal of Black Psychology*, 44(3), 219-246.
- Webster, J. L., Dunford, E. K., Hawkes, C., & Neal, B. C. (2011). Salt reduction initiatives around the world. *Journal of hypertension*, 29(6), 1043-1050.
- Williams, B., Onsman, A., & Brown, T. (2010). Exploratory factor analysis: A five-step guide for novices. *Australasian journal of paramedicine*, 8(1), 1-13.
- World Health Organisation. (2015). WHO Calls On Countries To Reduce Sugars Intake Among Adults And Children. Retrieved 15th May, 2021 from <https://www.who.int/news/item/04-03-2015-who-calls-on-countries-to-reduce-sugars-intake-among-adults-and-children>

- World Health Organisation. (2021, 09 June 2021). Obesity and overweight. Retrieved 14th January, 2023 from <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>
- World Obesity. (2022, 13 September 2022). Global Obesity Observations - South Africa. Retrieved 14th January, 2022 from <https://data.worldobesity.org/country/south-africa-197/>
- Wrottesley, S. V., Stacey, N., Mukoma, G., Hofman, K. J., & Norris, S. A. (2021). Assessing sugar-sweetened beverage intakes, added sugar intakes and BMI before and after the implementation of a sugar-sweetened beverage tax in South Africa. *Public health nutrition*, 24(10), 2900-2910.
- Yong, A. G., & Pearce, S. (2013). A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in quantitative methods for psychology*, 9(2), 79-94.
- Zhao, D., Han, F., Meng, M., Ma, J., & Yang, Q. (2019). Exploring the influence of traffic enforcement on speeding behavior on low-speed limit roads. *Advances in Mechanical Engineering*, 11(12), 1-9.
- Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2012). *Business research methods* (9th ed.). South-Western: Cengage Learning.
- Zupanič, N., Mis, N. F., & Pravst, I. (2020). Soft drinks: Public health perspective. In C. M. G (Ed.), *Trends in non-alcoholic beverages* (1st ed., pp. 325-369). London: Elsevier.

APPENDIXES

Appendix 1: South African Population Age Breakdown



Source - Statistics South Africa (2019)

Appendix 2: Cover Letter

Good day

Thank you for taking the time to complete this academic questionnaire. I am a post-graduate student at Wits Business School (WBS) pursuing a Master of Management degree in the field of Strategic Marketing, and this research forms part of my academic qualification.

I am conducting research for my dissertation titled "**The Influence of Regulatory Interventions on Consumption Behaviour of Sugar-sweetened Beverages in South Africa**". This research seeks to assess whether the regulatory interventions introduced by the South African Government have influenced the consumption behaviour of sugar-sweetened beverages amongst South Africans.

You have been approached because you are a South African consumer who consumes sugar-sweetened beverages. Please click on the survey link below, which should take less than ten minutes to complete. Please answer all questions for the purpose of using the data in the research. Your responses are anonymous/confidential, and your individual responses will not be identified by name in the final report.

Your participation is voluntary, and by completing and returning the questionnaire, you confirm that you are aged between 18 and 59 years and that you consent to your responses being used for this research project. Your views will be valuable to the study. Thank you for participating in the study.

Researcher:

Kgomotso Mosenogi

Email: kgomotso@yandex.com

Tel: +27 82 7555 498

Supervisor:

Prof. Fanny Saruchera

Email: fanny.saruchera@wits.ac.za

Tel : +27 11 717 3787

Appendix 3: Research Instrument

Please indicate your answer by ticking (X) on the appropriate box. This questionnaire is strictly for research purposes only.

SECTION A – QUALIFIER QUESTIONS

Sugar-sweetened beverages are beverages with added sugar, such as fruit juices, soft drinks, sports and energy drinks, vitamin water drinks and sweetened iced tea.

Q1. Do you currently consume sugar-sweetened beverages?

Yes	
No	

If no, the survey is to be terminated immediately.

Q2. Were you a consumer of sugar-sweetened beverages before 2016?

Yes	
No	

If no, the survey is to be terminated immediately.

SECTION B: GENERAL INFORMATION

This section asks general information about your background. Please indicate your answer by ticking (X) on the appropriate box.

Q3. Please indicate your age category

18 – 24 years	
25 – 34 years	
35 – 44 years	
45 – 54 years	
54 – 59 years	

Q4. Please indicate your highest academic level

Below matric	
Matric	
Diploma/Degree	
Postgraduate degree	
Other (specify)	

Q5. Please indicate your monthly income

R4000 and less	
R4001 to R6000	
R6001 to R10 000	
R10 001 and more	

SECTION C: SUGAR-SWEETENED BEHAVIOUR CONSUMPTION BEHAVIOUR

Q6. Which Sugar-sweetened Beverage category is your favourite? Choose all that apply.

Fruit Juice	
Soft Drink	
Sports and energy drink	
Flavoured water	
Ice Tea	

Please indicate to what extent you consumed your favourite sugar-sweetened beverage after the introduction of the sugar tax in South Africa in 2018.

Q7. I still consume my favourite sugar-sweetened beverage after the introduction of the sugar tax.

0	1	2	3	4	5	6
Never	Rarely, in less than 10% of the chances when I could have	Occasionally, in about 30% of the chances when I could have	Sometimes, in about 50% of the chances when I could have	Frequently, in less than 70% of the chances when I could have	Usually, in less than 90% of the chances when I could have	Every time

SECTION C: SUGAR TAX

Q8. Are you aware of the Sugar Tax and its implications?

Yes	
No	

SECTION D: PRODUCT REFORMULATION

Please indicate to what extent you agree or disagree with each statement. Please complete all questions.

Q9. I have noticed changes in the taste of my favourite sugar-sweetened beverage.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q10. I have noticed that there is less sugar in my favourite sugar-sweetened beverage.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q11. I have noticed a variety of changes in sugar-sweetened beverages to include low-sugar or no-sugar alternatives.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q12. I enjoy the new taste of my favourite sugar-sweetened beverage.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q13. I prefer the taste of sugar-sweetened beverages before the reduction in sugar content.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q14. I recognise that the reduction in sugar in my favourite sugar-sweetened beverage is for the good of my health.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

SECTION E: PRODUCT SIZE

Please indicate to what extent you agree or disagree with each statement. Please complete all questions.

Q15. I have noticed changes in the size of my favourite sugar-sweetened beverage.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q16. The size of my favourite sugar-sweetened beverage has been reduced.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q17. I am getting value for money with the current package size of my favourite sugar-sweetened beverage.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q18. I am aware of the reason for the change in the size of my favourite sugar-sweetened beverage.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q19. I will continue to buy my favourite sugar-sweetened beverage regardless of the changes in its size.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

SECTION F: PRODUCT PACKAGING

You can indicate the extent to which you agree or disagree with the statement by ticking the 7-point scale below:

Q20. I have noticed changes in the packaging of my favourite sugar-sweetened beverage.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q21. I read the nutritional labels of sugar-sweetened beverages before I purchase them.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q22. There is low sugar and no sugar alternative information displayed on the package of my favourite drink.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q23. I am discouraged from buying my favourite sugar-sweetened beverage because of the information shown on the package.

0	1	2	3	4	5	6
---	---	---	---	---	---	---

Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
----------------------	----------	----------------------	---------	-------------------	-------	-------------------

SECTION G: PRICE

You can indicate the extent to which you agree or disagree with the statement by ticking the 7-point scale below:

Q24. The price of my favourite sugar-sweetened beverage has increased

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q25. My favourite sugar-sweetened beverages are reasonably priced.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q26. I am mindful of the price changes of my favourite sugar-sweetened beverage.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q27. The price of my favourite sugar-sweetened beverage affects how often I buy the product.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q28. I will continue to buy my favourite sugar-sweetened beverage regardless of the price.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

SECTION H: PROMOTION

You can indicate the extent to which you agree or disagree with the statement by ticking the 7-point scale below:

Q29. I am aware of advertisements that show the dangers of consuming a lot of sugar.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q30. I am aware of low-sugar or no-sugar alternatives of my favourite sugar-sweetened beverage through the media.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q31. The media has helped me be more health-conscious about my diet.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q32. The media has given me enough information to reduce my sugar consumption.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q33. There is enough information to help me to make informed decisions about my diet in the media.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Q34. I go out of my way to find nutritional information about the sugar-sweetened beverages I consume.

0	1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Appendix 4 – Pilot Study Component Matrix - Product Formulation – Iteration 1 to 3

Table 1: Component Matrix - Product Formulation – Iteration 1

Component Matrix ^a	
	Component 1
Q9___14_4 Product Reformulation - I enjoy the new taste of my favourite sugar sweetened beverage.	.898
Q9___14_6 Product Reformulation - I recognise that the reduction in sugar in my favourite sugar sweetened beverage is for the good of my health.	.768
Q9___14_3 Product Reformulation - I have noticed a variety of changes in sugar sweetened beverages to include low-sugar or no-sugar alternatives.	.744
Q9___14_2 Product Reformulation - I have noticed that there is less sugar in my favourite sugar sweetened beverage.	-.432
Q9___14_5 Product Reformulation - I prefer the taste of my favourite sugar sweetened beverages before the reduction in sugar content.	.331
Q9___14_1 Product Reformulation - I have noticed changes in the taste of my favourite sugar sweetened beverage.	
Extraction Method: Principal Component Analysis.	

Table 2: Component Matrix - Product Formulation – Iteration 2

Component Matrix ^a	
	Component 1
Q9___14_4 Product Reformulation - I enjoy the new taste of my favourite sugar sweetened beverage.	.898
Q9___14_6 Product Reformulation - I recognise that the reduction in sugar in my favourite sugar sweetened beverage is for the good of my health.	.769
Q9___14_3 Product Reformulation - I have noticed a variety of changes in sugar sweetened beverages to include low-sugar or no-sugar alternatives.	.742
Q9___14_2 Product Reformulation - I have noticed that there is less sugar in my favourite sugar sweetened beverage.	-.439
Q9___14_5 Product <u>ormulation</u> - I prefer the taste of my favourite sugar sweetened beverages before the reduction in sugar content.	.320
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Table 3: Component Matrix - Product Formulation – Iteration 3

Component Matrix^a	
	Component
	1
Q9__14_4 Product Reformulation - I enjoy the new taste of my favourite sugar sweetened beverage.	.898
Q9__14_6 Product Reformulation - I recognise that the reduction in sugar in my favourite sugar sweetened beverage is for the good of my health.	.769
Q9__14_3 Product Reformulation - I have noticed a variety of changes in sugar sweetened beverages to include low-sugar or no-sugar alternatives.	.742
Q9__14_2_R Product Reformulation - I have noticed that there is less sugar in my favourite sugar sweetened beverage.	.439
Q9__14_5 Product Reformulation - I prefer the taste of my favourite sugar sweetened beverages before the reduction in sugar content.	.320
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Appendix 5 – Pilot Study Component Matrix - Product Size – Iteration 1 to 2

Table 4: Component Matrix - Product Size – Iteration 1

Component Matrix^a	
	Component
	1
Q15_1 Product Size - I have noticed changes in the size of my favourite sugar sweetened beverage.	.950
Q15_2 Product Size - The size of my favourite sugar sweetened beverage has been reduced.	.930
Q15_4 Product Size - I am aware of the reason for the change in the size of my favourite sugar sweetened beverage.	.726
Q15_3 Product Size - I am getting value for money with the current package size of my favourite sugar sweetened beverage.	-.634
Q15_5 Product Size - I will continue to buy my favourite sugar sweetened beverage regardless of the changes in its size.	-.129
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Table 5: Component Matrix - Product Size – Iteration 2

Component Matrix^a	
	Component
	1
Q15_1 Product Size - I have noticed changes in the size of my favourite sugar sweetened beverage.	.949
Q15_2 Product Size - The size of my favourite sugar sweetened beverage has been reduced.	.934
Q15_4 Product Size - I am aware of the reason for the change in the size of my favourite sugar sweetened beverage.	.749
Q15_3_R Product Size - I am getting value for money with the current package size of my favourite sugar sweetened beverage.	.606
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Appendix 6 – Pilot Study Component Matrix - Product Packaging

Table 6: Component Matrix - Product Packaging

Component Matrix^a	
	Component
	1
Q20_1 Product Packaging - I have noticed changes in the packaging of my favourite sugar sweetened beverage.	.909
Q20_4 Product Packaging - I am discouraged to buy my favourite sugar sweetened beverage because of the information shown on the package.	.849
Q20_2 Product Packaging - I read the nutritional labels of sugar sweetened beverages before I purchase them.	.472
Q20_3 Product Packaging - There are low-sugar and no-sugar alternatives information displayed on the package of my favourite drink.	.357
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Appendix 7 – Pilot Study Component Matrix – Price

Table 7: Component Matrix - Price – Iteration 1

Component Matrix^a	
	Component
	1
Q24_1 Price - The price of my favourite sugar sweetened beverage has increased.	.809
Q24_3 Price - I am mindful of the price changes of my favourite sugar sweetened beverage.	.783
Q24_4 Price - The price of my favourite sugar sweetened beverage affects how often I buy the product.	.609
Q24_5 Price - I will continue to buy my favourite sugar sweetened beverage regardless of the price.	.463
Q24_2 Price - My favourite sugar sweetened beverages is reasonably priced.	-.436
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Table 8: Component Matrix - Price – Iteration 2

Component Matrix^a	
	Component
	1
Q24_1 Price - The price of my favourable sugar sweetened beverage has increased.	.809
Q24_3 Price - I am mindful of the price changes of my favourite sugar sweetened beverage.	.783
Q24_4 Price - The price of my favourite sugar sweetened beverage affects how often I buy the product.	.609
Q24_5 Price - I will continue to buy my favourite sugar sweetened beverage regardless of the price.	.463
Q24_2_R Price - My favourite sugar sweetened beverages is reasonably priced.	.436
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Appendix 8 – Pilot Study Component Matrix – Promotion**Table 9: Component Matrix - Promotion – Iteration 1**

Component Matrix^a	
	Component
	1
Q29_4 Promotion - The media has given me enough information to reduce my sugar consumption.	.887
Q29_3 Promotion - The media has helped me be more health conscious about my diet.	.875
Q29_1 Promotion - I am aware of advertisements that show the dangers of consuming a lot of sugar.	.824
Q29_2 Promotion - I am aware of low-sugar or no-sugar alternatives of my favourite sugar sweetened beverage through the media.	.557
Q29_5 Promotion - There is enough information to help me make informed decisions about my diet in the media.	.307
Q29_6 Promotion - I go out of my way to find nutritional information about the sugar sweetened beverages I consume.	.197
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

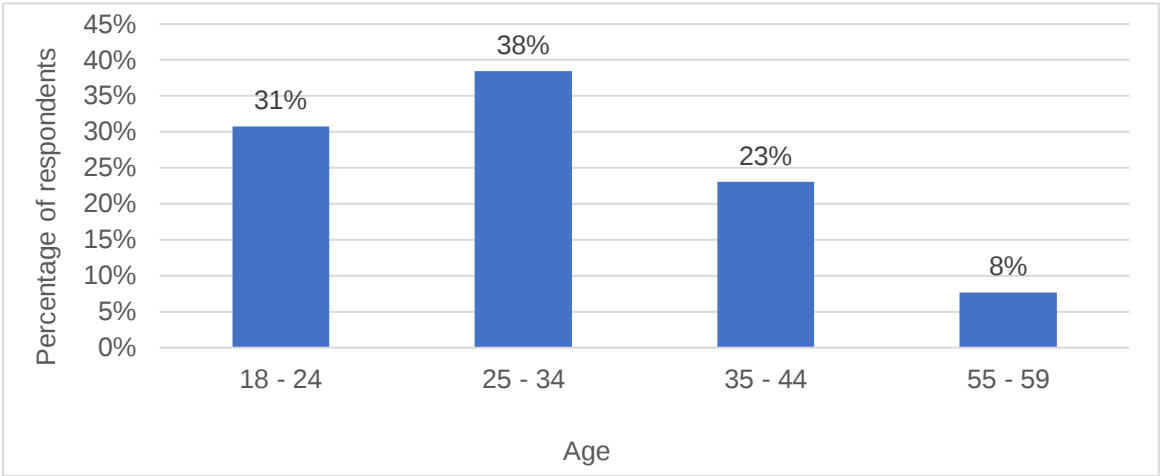
Table 10: Component Matrix - Promotion – Iteration 2

Component Matrix^a	
	Component
	1
Q29_4 Promotion - The media has given me enough information to reduce my sugar consumption.	.896
Q29_3 Promotion - The media has helped me be more health conscious about my diet.	.875
Q29_1 Promotion - I am aware of advertisements that show the dangers of consuming a lot of sugar.	.812
Q29_2 Promotion - I am aware of low-sugar or no-sugar alternatives of my favourite sugar sweetened beverage through the media.	.589
Q29_5 Promotion - There is enough information to help me make informed decisions about my diet in the media.	.280
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

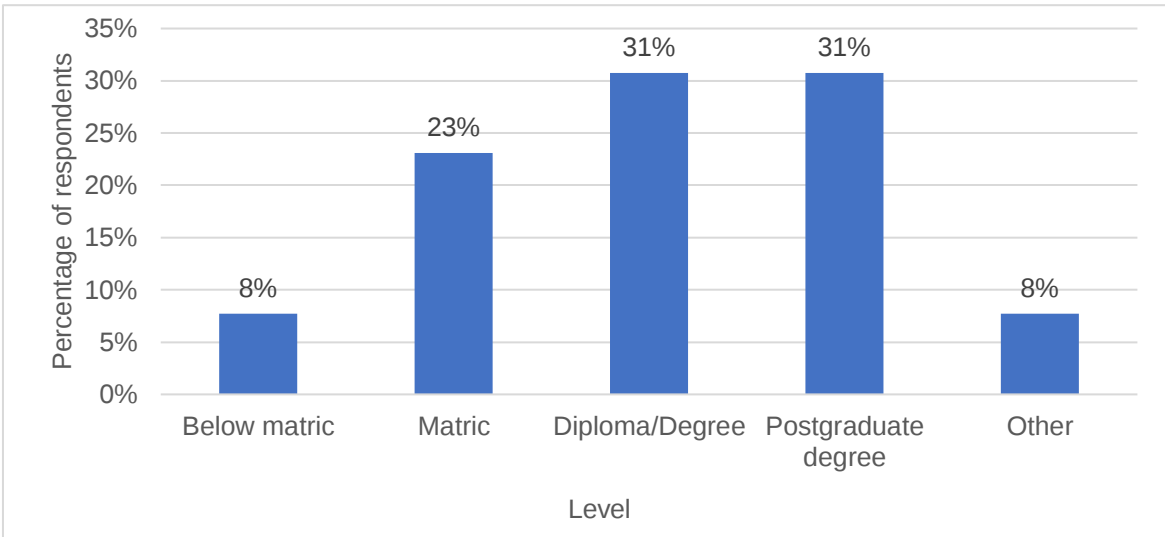
Table 11: Component Matrix - Promotion – Iteration 3

Component Matrix^a	
	Component
	1
Q29_4 Promotion - The media has given me enough information to reduce my sugar consumption.	.892
Q29_3 Promotion - The media has helped me be more health conscious about my diet.	.872
Q29_1 Promotion - I am aware of advertisements that show the dangers of consuming a lot of sugar.	.803
Q29_2 Promotion - I am aware of low-sugar or no-sugar alternatives of my favourite sugar sweetened beverage through the media.	.634
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

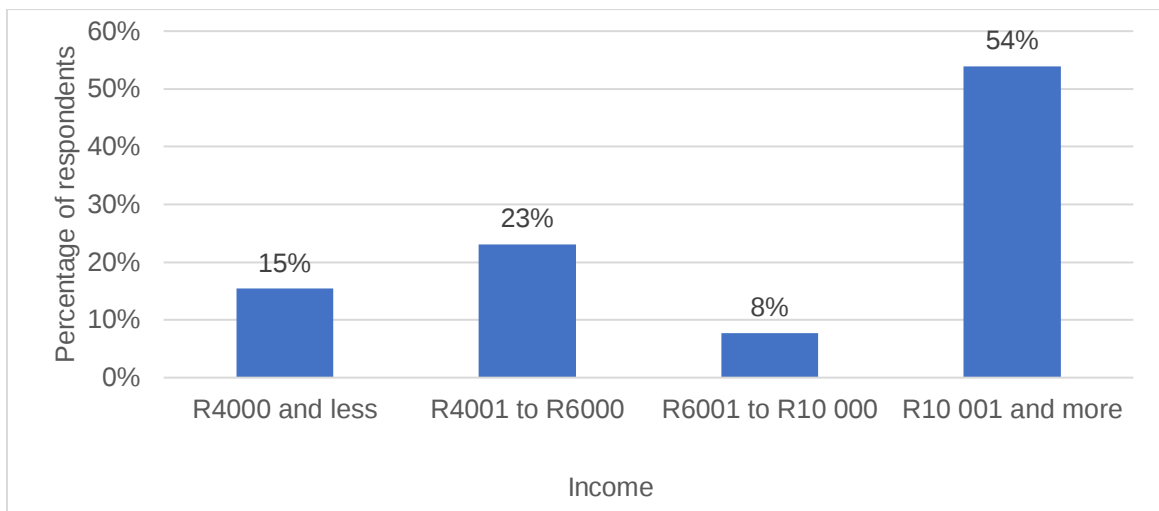
Appendix 9 - Results of the Pilot Study



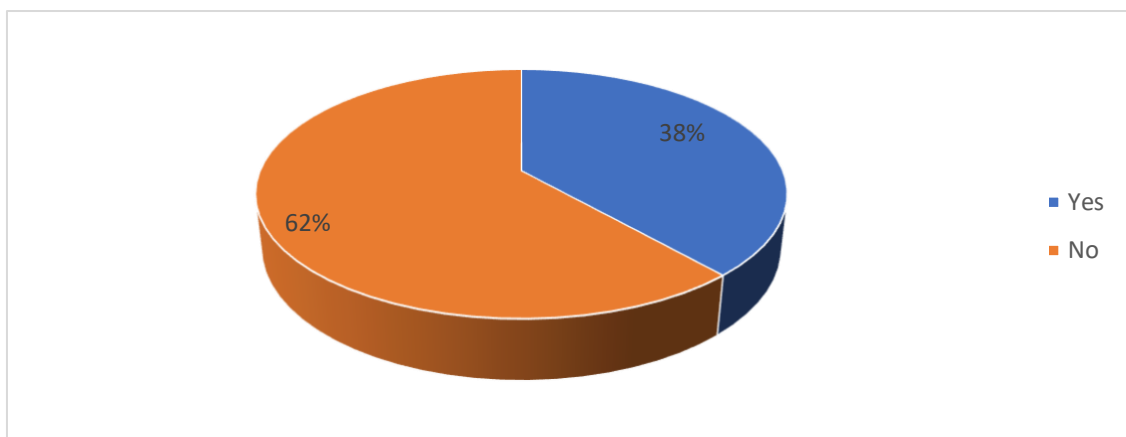
Respondent age



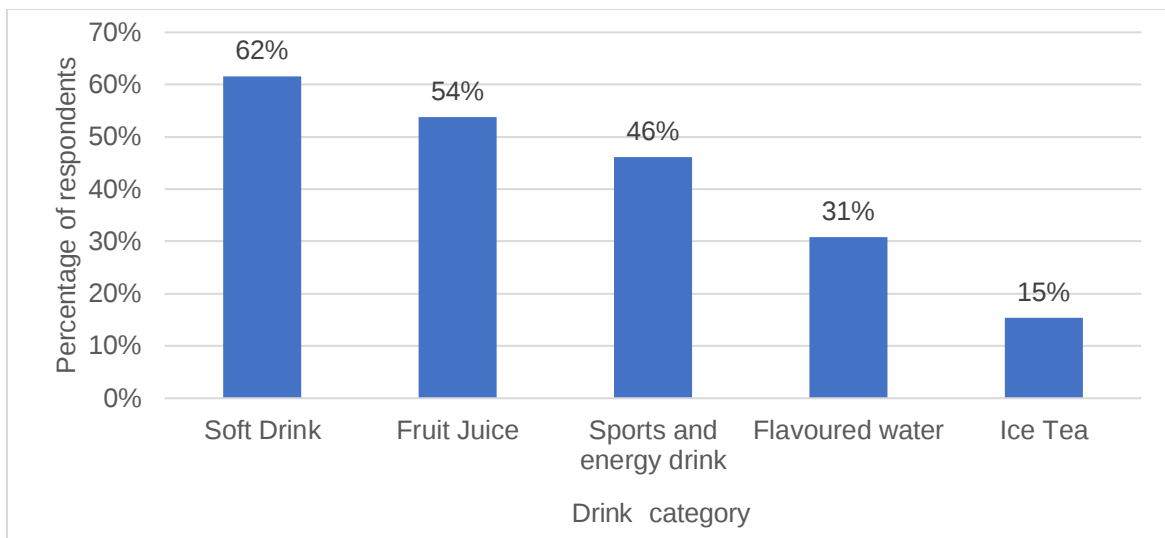
Highest academic level



Monthly Household Income



Aware of the Sugar Tax and its implications



Favourite Sugar-sweetened Beverage category

Appendix 10: Ethical Clearance Certificate

Graduate School of Business Administration
University of the Witwatersrand, Johannesburg



Wits Business School Ethics Committee
Constituted under the University Human Research Ethics Committee (Non-Medical)

Ethics Clearance Certificate

Ethics protocol number: WBS/SM1138028/247

This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below).

Project title	Regulatory interventions and the consumption of sugar sweetened beverages in South Africa
Investigator / Researcher	Ms Kgomotso Mosenogi
Nature of Project	MM (Strategic Marketing)
Decision of the Committee	Approved, provided stakeholders and participants are guaranteed anonymity and confidentiality.
Issue Date of Certificate	2023-05-18
Expiry date	Date of submission of the project / research report
Chairperson	Dr Pius Oba +27 11 717 3976 +27 82 733 6587 pius.oba@wits.ac.za

Declaration by Researcher

One copy must be signed by the Researcher and returned to the Chairperson of the Wits Business School Ethics Committee.

I fully understand the conditions under which I am authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I undertake to resubmit the protocol to the Committee.

Signature

18 May 2023

Date:

Appendix 11: Language Editing Memorandum

EDITING CONFIRMATION

To whom it may concern:

This memo serves to confirm that the manuscript/research project detailed below has been language-edited and/or proof-read.

Regards,

-SM001-

S.M. (Cert. Lang. Ed.)
Language Editor

Manuscript Title:

Regulatory interventions and the consumption of sugar sweetened beverages in South Africa

Author:

Kgomotso Mosenogi

Issued on:

29/02/2024

Disclaimer:

The editor/proofreader makes no claim as to the accuracy of the manuscript contents nor the objectives of the author. While all possible efforts have been made to ensure the text as edited is readable and grammatically correct, the author(s) have the option to accept or reject suggestions and trackable changes made to the document before submission.

*** SC Professional Editors ***

sarchcot@gmail.com