

**'An Investigation into the introduction of a tax on sugar  
sweetened soft drinks in Ireland and its impact on consumers'  
buying behaviour.'**

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MSc. in Management

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**Submission of Thesis and Dissertation**

## Abstract

**Title:** 'An Investigation into the introduction of a tax on sugar sweetened soft drinks in Ireland and its impact on consumers buying behaviour.'

**Name:** Simon O'Connor

**Purpose:** The purpose of this study is to investigate the impact on buying behaviour of Irish consumers since the introduction of a sugar tax on sugar sweetened soft drinks. It will seek understand if behaviour has shifted since the introduction of the tax and will identify the main factors that impact upon buying behaviour. In addition, the research will focus on both the price and sugar content of soft drinks and explore if these influence behaviour change. The Irish Government's aim of the tax is to shift consumers from sugar sweetened soft drinks to healthier alternatives, which may lead to lowering the obesity rates. This study aims to establish if this tax is succeeding in its aim.

**Structure:** This study adopts a quantitative approach to research, where respondents were questioned through a structured web-based, open and closed question survey to gather robust data to understand the main factors that influenced any shifts in behaviour.

**Originality/Value:** This research adds knowledge and understanding to several areas, with detailed attention on Irish consumer behaviour with regards to this tax, especially as this tax was introduced less than six months before this research project. The research will also add knowledge regarding the impact of a 'sin' tax on overall behaviour, the impact of price on consumer decisions, and if sugar content is affecting behavioural decisions. The research updates the vast existing literature in this area and identifies the challenges that governments might face should they implement additional sin taxes. The research can also provide important information on consumer behaviour to other fast-moving consumer goods producers, should the base for sugar tax be widened to other categories such as breakfast cereals or confectionary.

**Concluding Statement:** Results indicate that Irish consumers have not shifted their buying behaviour since the introduction of the sugar tax on sugar sweetened soft drinks. Price and sugar do not play a role when buying a soft drink and Irish consumers' perceptions of sugar content on a wide range of beverages is significantly inaccurate.

**Keywords:** Consumer Behaviour; Obesity; Sin Taxes; Public Health; Sugar tax; Addiction; Soft drinks; Sugar Content, Sugar Perceptions.

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## **Dedication**

I dedicate this Thesis to my late mother, Bernie O'Connor, although she didn't manage to get to see me finish my master's, her unending love and support from the start stayed with me all the way and ensured that I managed to get through it. I did it Mam.

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## List of Abbreviations

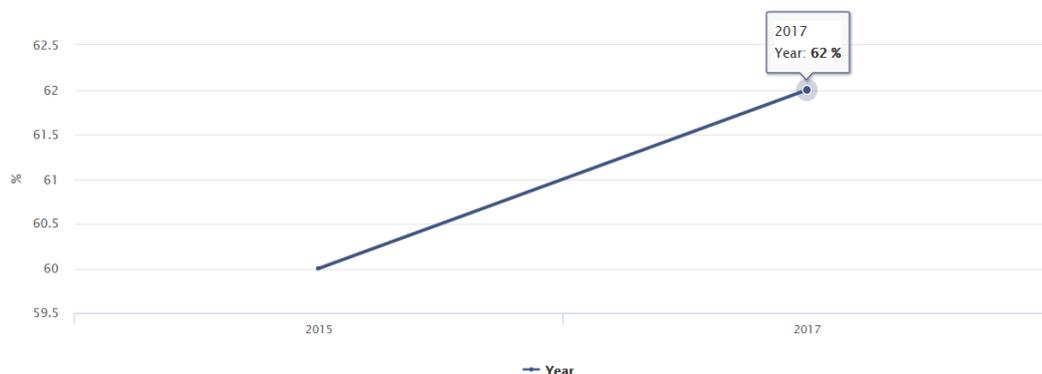
<b>Name</b>	<b>Abbreviation</b>
Artificially Sweetened Beverage / s	ASB / ASB's
Body Mass Index	BMI
Central Statistics Office	CSO
Central Statistics Office	CSO
Degrees of Freedom	(Df)
Gross Domestic Product	GDP
Healthy Ireland	HI
Hypothesis	H
Irish Beverage Council	IBC
Number	N
Significant Difference Value	<i>P</i>
Standard Error	SE
Statistical Package for the Social Sciences	SPSS
Sugar Sweetened Drinks	SSD
Exponential Value	Exp (B)
€	Currency of the European Union – (Euro)
£	Currency of the United Kingdom – (Sterling)
\$	Currency of United States of America – (Dollars)

## Introduction

In recent years, the study of worldwide obesity levels has significantly increased, leading to claims that obesity and being overweight is now a worldwide epidemic. In addition, there are more than 2.8 million people dying worldwide because of problems related to excess weight (Mancini, Marotta, Nazzaro, Simonetti, 2015). A considerable amount of the research has focused on the main causes of obesity and has resulted in the implementation of effective interventions to control the crisis. However, Ireland as a nation has, so far, been unsuccessful in its attempts to reduce rising obesity levels.

In 2005, the Irish Government identified obesity as a significant issue and developed a strategy on obesity prevention. Outlined in the strategy were 93 recommendations to assist in the prevention of obesity. However, in 2009, a review of its implementation found that only 18 of the 93 recommendations were fully implemented (Dept. of Health, 2009), which is strong evidence to suggest that it is a contributory factor that has led to Ireland becoming a leading contributor to the obesity and overweight epidemic.

It was indicated in 2015 that up to 60% of the Irish population were either overweight or obese, according to data from the *Dept. of Health (2015)*. The classification of a person, as being overweight, is if their Body Mass Index (BMI) exceeds 25. They are classified as being obese if their BMI is 30 or higher (Central Statistics Office, 2017). In the space of just two years, the obesity rate has risen to 62%.



**Figure 1 - Percentage of Irish people who are overweight or obese**

**Source: CSO (2018)**

More recently, a report conducted by the World Health Organisation (WHO) forecast that Ireland could be the most obese nation in Europe by 2025 (WHO, 2015). Should this forecast become a reality, the impact on Ireland is incalculable, as overweight and obesity is already having an enormous impact on individuals and society; additionally, it is causing an unsustainable burden on the Irish health service, according to the Dept. of Health (2015).

The global epidemic of obesity and causes have been widely investigated, with main factors indicating that it is societal factors that are now promoting sedentary lifestyles and leading to the consumption of high-fat, energy-dense diets (WHO, 2000). In the same vein, the neoclassical theory developed by Philipson and Posner (2003) considers the main cause of obesity to be due to the reduction of the energy consumption in the workplace due to technological processes. They continue to point out that the technological change has had a twofold effect, with one part being lower energy expenditure in the workplace. However, more importantly, the improvement in productivity is resulting in cheaper food and drink. Thus, consumers' daily lives have shifted over the years, which has had an impact on their drinking and eating behaviour.

Recent evidence indicates that due to working longer hours and having less free time has resulted in unhealthy eating behaviours (Escoto, Lask, Larson and Neumark-Sztainer, 2015). Furthermore, returning to the neoclassical theory developed by Philipson and Posner (2008), the model analysed the influence of income on weight and identified a non-monotonic relationship between these two variables: people with a lower income tend to buy cheaper and more calorie dense foods, which is a factor also to consider.

In recent years, there has been an increasing amount of literature on the impact of sugar consumption in our diet and the impact on our overall health. Not to mention the considerable amount of literature of the strong association between the consumption of sugar sweetened soft drinks and its link to rising obesity levels (Borges, Louzada, De Sa, and Lavery, 2017; Nakhimovsky, Feigl, Avila, and O'Sullivan, 2016; Finkelstein, Lopez and Fantuzzi, 2012).

The link between soft drinks and obesity is not new. In 1942, the American Medical Association recommended limiting sugar intake, as at that time Americans consumed 90 (240ml) servings per year, rising to over 600 servings by the year 2000 (American Medical Association, 1942; Jacobson, 2005).

The introduction of the tax on sugar sweetened soft drinks was introduced by the Irish Government on the 2<sup>nd</sup> May 2018. This was in response to both the increase in attention of worldwide obesity and the rising obesity and overweight levels in Ireland.

This dissertation will investigate the introduction of the recent sugar tax on full sugar soft drinks to see if it is having an impact on the buying behaviour of Irish consumers. It will examine the main factors that have had an impact on the decision-making process when buying soft drinks.

Most of the literature on the introduction of sugar taxes on soft drinks is based on behaviour in countries after they have introduced the sugar sweetened soft drinks tax. What it is not yet clear is what impact the introduction of the sugar tax will have on the Irish consumer. Therefore, the questions below will guide the study:

- *Can the sugar tax cause a shift in buying behaviour to achieve the desired outcome for the government?*
- *How much influence does price have when purchasing soft drink?*
- *Does sugar content influence a consumer when buying a soft drink?*

To condense these questions, the following is proposed;

***'Since the introduction of the tax on sugar sweetened soft drinks in Ireland, has it had an impact on consumers buying behaviour'***

Returning to the Irish Government's response to the obesity epidemic using established international models and frameworks, the Irish Government in 2013 introduced a framework titled '*A framework for Improved health and wellbeing 2013-2025*', of which part of the vision was '*a healthy Ireland, where everyone can enjoy physical and mental health and wellbeing*' (Dept. of Health, 2013).

As part of this framework, there was a clear indication that the rising levels of being overweight and obese is having a detrimental effect on individuals and society and the health service.

There are both direct and indirect economic consequences of obesity; direct costs include all associated health care costs, while indirect costs include lower productivity and poor performance due to absenteeism and presenteeism, social exclusion, premature mortality, disability, and even higher insurance premiums (Miljkovic, 2006).

According to the Dept. of Health (2013), obesity in Ireland is presenting a real clinical, social, and financial challenge that would have a detrimental legacy that could last decades. Also highlighted was the significant financial burden being put on the state, with an estimated annual economic cost of €1.13 billion, which is a significant amount considering that the total health expenditure in 2015 was €19.9 billion, which equates to a total of 7.8% of GDP (CSO, 2015).

As part of this national framework, the Government highlighted its intent to introduce a sugar tax on all sugar sweetened soft drinks as a method to shift consumer behaviour. This was based on the basic principle that a price increase on a soft drink will cause a shift in buying behaviour (Nakhimovsky, *et al.*, 2016; Gustavsen and Rickertsen, 2011). This would in fact result in Irish consumers buying and consuming healthier options, which would reduce net energy intake through sugar and prevent further growth in obesity levels.

Total soft drinks production and consumption in Ireland is high. According to BordBia, the Irish food board (2018), soft drinks in Ireland recorded a growth of 1% in 2016, with total value sales of €1.4 billion. This equated to 169 litres of soft drinks per capita consumption (Globaldata, 2018; CSO,2016), Using these figures and implementing this tax, the Irish

Government has estimated the tax yield will be in the region of €40 million per annum (Dept. of Finance, 2017).

The Irish Beverage Council (IBC) is a body that represents companies that produce, distribute, and market beverages, including, soft drinks, fruit juices, bottle water, sports and energy drinks throughout the island of Ireland. The council recognised the 'growing societal multifactorial challenge of obesity' and stated that it was committed to playing its part to reduce this obesity issue. However, they did indicate discontent with the introduction of the tax and highlight that the tax is a discriminatory tax, as it ignores the fact that only 3% of the nation's total calorific intake is coming from sugar sweetened soft drinks (Dept. of Finance, 2017), which when compared with the literature suggests that it is closer to 7% (Drenkard, 2013). These results would seem to suggest that soft drink consumption in Ireland is not a leading contributor to calorie intake, which calls into question the introduction of the sugar tax.

As previously identified, the object of this thesis is to investigate what impact, if any, the introduction of a tax on sugar sweetened soft drinks has had on consumer buying behaviour. The study will first research recent and significant literature related to taxes on soft drinks. This is based on countries that have introduced this tax already. It is not the purpose of this study to investigate obesity levels in Ireland, or to investigate if there has been a drop in BMI indicators on the Irish population. Nor will this study investigate the attitudes towards the 'sin tax', taxation, individual consumption of soft drinks, or brand loyalty.

Having researched the literature related to countries that have introduced the taxes, the clear majority of the literature is based on sales data, post sugar tax implementation. Due to the limitation that the sugar tax was only introduced in May 2018, this was not an option for the research, as a more longitudinal approach would be needed. Therefore, a quantitative approach was undertaken to investigate if buying behaviour has moved since the introduction of the tax, to investigate what factors if any have influenced the shift, in addition to understanding what role sugar content and price of soft drinks have on the Irish consumer.

## **Thesis Outline**

This chapter identified the importance of the research topic, background information about why the tax was introduced in Ireland and indicated what is set out in the research to achieve answers to the objectives. The remaining chapters of the thesis are organised as follows.

### **Chapter 2**

Chapter two looks at the current obesity crisis, followed by a comprehensive literature review. The key areas covered include: (1) The Obesity Crisis causes and impact, (2) Measures to control obesity and overweight, (3) Substitution beverages, (4) Government intervention, (5) Manufactures response, and (6) Gaps in current research. Also contained is the description of the research aims and objectives that are to be investigated in the study and the definition hypotheses used.

### **Chapter 3**

Chapter three outlines the methodology and describes the research strategy and what instrument was used. The chapter will also describe the research approach and justify its use for the study.

### **Chapter 4**

In chapter four, a comprehensive analysis of the collected data will be conducted, where all findings will be clearly laid out relating to each research objective.

### **Chapter 5**

Chapter six contains the results and analysis of the data, followed by analysis that will relate back to the literature, it will also contain conclusions based on the findings. Also included are limitations to the research and identifies areas where further research is required or suggested.

## Literature Review

It is well documented that the world is facing an obesity epidemic (Conway, Han, Munro, Gross, 2018; Taylor, Parento and Schmidt, 2015). This is underpinned by quantitative data which highlights that world obesity has tripled since 1975 (WHO, 2015). To illustrate its importance, in 2016, over 1.9 billion adults worldwide were overweight; included in this figure is that over 41 million children under the age of 5 were overweight, indicating that the obesity epidemic is far reaching and is affecting people of all ages (WHO, 2018). This supports the view that a greater focus is required to control the rise in obesity levels worldwide, especially as the World Health Organisation (WHO) states that obesity is preventable (WHO, 2017).

Furthermore, according to Hawkes (2006), consumption of foods high in fats and sweeteners is increasing throughout the developing world and the nutritional transition, implicated in the rapid rise of obesity and diet-related chronic diseases worldwide, is rooted in the processes of globalization. Similarly, others (Ezzati, Vanderhoorn, Lawes and Leach, 2005) reported that the obesity epidemic is having an enormous impact on global health trends, with health problems such as diabetes, which is now accounting for a greater impact than on health than infectious diseases in developing countries. Although it is a widely held view that industrialised countries have the highest obesity rates, the epidemic is rapidly spreading to low and middle-income countries, with the increase of 'Hyperpalatable foods', which are laden with high levels of processed sugar and salt, resulting in dramatic increases in obesity levels (Gearhardt, Grilo, Dileone and Bronell, 2011).

Governments worldwide have responded to the epidemic both by strengthening traditional interventions and by developing novel legislative strategies. Some areas that governments are tackling, and which have been identified by Taylor, Parento and Schmidt (2015), include the following five areas:

- (1) Enhanced and tailored tax measures;
- (2) Broadened use of counter-advertising and health campaigns;
- (3) Expanded food labelling;
- (4) Imposed greater restrictions on advertising and marketing to children;
- (5) Strengthened restrictions, standards, and bans on specific foods and food additives.

Despite these actions, Taylor *et al.* (2015) has called for a centralised publicly accessible database of interventions and suggest there is a need for an international strategy to overcome the global obesity crisis.

### **Demand for Taxation**

Globally, there have been increased calls from the medical profession for governments to introduce a tax on sugar sweetened drinks in order to control obesity, as these products are viewed as a major contributory factor to obesity levels (Falbe and Madsen, 2017; O'Dowd, 2015). With so much global attention on rising obesity levels and the introduction of sugar taxes, it gave rise to the Irish medical profession calling for similar actions to be introduced in Ireland (Briggs, Mytton, Madden, O'Shea, 2013).

One criticism with the literature is that the majority of the studies examining the effect of a sugar tax have come from the United States, where consumption is far greater than Ireland (Briggs *et al.*, 2013). However, this interpretation contrasts with the expansive evidence that shows that consumption of sugar sweetened beverages has a direct link to obesity (Borges *et al.*, 2017; Nakhimovsky *et al.*, 2016; Finkelstein *et al.*, 2013).

Indeed, recent reviews emphasise this inconsistency, citing the lack of multiple studies into the effect of sugar intake and how increased levels of sugar intake are linked to increased levels of diabetes, cancer, and micronutrient deficiencies (Hendriksen and Tjhuis, 2011), accounting for approximately 184,000 related deaths per year worldwide (Singh, Micha, Khatibzadeh and Lim, 2016). There are limitations to these studies, with the main limitations centred on the failure of most of these studies to consider factors such as fitness levels, the environment, overall diet, and peoples' genetic makeup (Liu, 2018). More

comprehensive studies of the impact of sugar intake on the human body are required, nevertheless, there is a global obesity crisis, with more recent evidence indicating that sugar is linked to obesity. To combat this crisis and shift human behaviours, it is important that governments investigate all areas contributing to increased obesity levels. However, with limited evidence on the economic impact of such a tax, it has been highlighted as one of the major barriers for policy makers when implementing such a tax on unhealthy food products (Sharma, Hauck, Hollingsworth and Sicilani, 2014).

It is interesting to note that where fiscal measures have been proposed as effective strategies to influence behaviours, there is still limited ability to conclude that the prospective effect of actual price changes have on actual changes in consumption, so price changes may improve the diet, yet, this evidence lacks quantitative assessment of effectiveness (Ashfin, Penalvo, Del Gobbo and Silva, 2017).

### **Addictive Nature of Sugar Sweetened Drinks**

It is important to highlight and discuss the addictive nature of sugar sweetened drinks. Much of the current literature on their addictive nature is due to the main ingredients, which include caffeine and sugar, both of which have strong addictive qualities, with sugar having a high glycaemic content, considered to be the key variable of the addictive attribute (Wang, Rojas and Colantuoni, 2016). Extensive research suggests that consumers may in fact be addicted to sugar in their diets (Westwater, Fletcher and Ziauddeen, 2016; Trivedi, 2010), while other researchers have gone a step further and have found that, in extreme cases, sugar may be more addictive than cocaine (Gearhardt *et al.*, 2011; Lenoir *et al.*, 2007). A growing body of research has identified that conventional addiction disorders and excessive consumption of calorie-dense foods have major comparisons (Gearhardt *et al.*, 2011).

Several studies thus far have reported that sugar products exhibit reward-related natural changes as identified with drug addiction, and despite the negative consequences, they show that they have similar behavioural signs, such as issues with withdrawal, tolerance of the product, and continuing to consume it (Avena, Rada and Hoebel, 2008). This evidence suggests that government intervention is required to change behaviours in a society.

Gearhardt *et al.* (2011) expands on this point by outlining that if people continue to ignore the analogous neural and behavioural effects of foods and drugs abuse, it will result in increased food-related disease and associated social and economic burdens.

These burdens are mainly attributed to the health service, with recent evidence from the United States indicating that reducing sugar sweetened beverages by one fifth could potentially reduce the country's healthcare costs by \$24 billion dollars (Falbe and Madsen, 2017). Much of the available literature implies there are significant benefits to the health service with an introduction of a sugar tax (Veerman, 2016). In contrast, Cobiac, Tam, Veerman and Blakely (2017) debate the full magnitude of the health gains. Equally, implementing such a tax may be seen as a regressive tax, commonly known as a sin tax (Briggs *et al.*, 2013; Holmes Perkins, 2014; O'Donoghue and Rabin, 2006).

## **Taxation**

The issue of a sugar tax has received considerable critical attention in the last 20 years, with calls for the tax to be introduced as a sin tax. Sin taxes originated in medieval sumptuary laws. A sumptuary law is any law designed to restrict excessive personal expenditures in the interest of preventing extravagance and luxury. The term denotes regulations restricting extravagance in food, drink, dress, and household equipment, usually on religious or moral grounds. Such laws have proved difficult or impossible to enforce over the long term (O'Donoghue and Rabin, 2006). These taxes have been justified as an attempt to generate revenue for the government and curb the consumption of unhealthy or undesirable products. Sin taxes are fast becoming a key instrument for governments to increase their tax intakes, with the increase of making formerly benign activities more "sinful" in order to make them taxable (Holmes and Perkins, 2014).

These taxes are used to raise revenue, as they rely on consumers that are addicted to the product, whose inelastic demand is resistant to price increases (Hoffer, Shughart and Thomas, 2017), with recent studies indicating that soft drinks have their own-price elasticity (Colantuoni and Rojas, 2015). As Mattoon and Wetmore highlight, there are other factors for a government to consider before implementing a sin tax, as revenue raised by sin taxes tend to be unsustainable over time and will decline in the long run (Mattoon and Wetmore, 2015).

Furthermore, if a sin tax is set too high, it will be effective at discouraging unhealthy consumption, but it will generate low levels of revenue; conversely, if the tax is set too low, it will generate strong levels of revenue but will fail to have a significant impact on the consumption of the sinful good (Liu, 2018). This is supported by research undertaken by Colantuoni and Rojas (2015) in North America, which illustrates that current taxes on soft drinks sales are too small and are failing to affect consumption in a sizeable manner.

There is significant discord that surrounds a sin tax and the ability of them to attain their stated goals (Creighton, 2010). According to Hoffer *et al.* (2017), sin taxes violate the two cornerstones principles of tax policy design:

- (1) Horizontally, it violates tax equity as the sin tax liability only falls upon people who buy the good or service.
- (2) Vertically, it violates tax equity as the amount of the sin product or service paid by a wealthier person is not any greater than the amount paid by a lower paid sinner.

Therefore, lawmakers need to be aware of the regressive nature and negative consequences of implementing a sin tax on the public. In addition, implementing such a 'corrective' tax may have beneficial effects on weight and health (Basu *et al.*, 2013). However, it is difficult to justify a sugar sweetened beverage (SSB) tax using the classical Pigouvian approach to taxation. A Pigouvian ( or "corrective") tax hold the idea that placing a small tax, equal to marginal social cost, on each unit of an activity to be discouraged, prices rise, and as a result of rising prices, purchasing and consumption will decrease (Fleischer, 2016; Holmes Perkins, 2014).

One major theoretical issue is that implementing such a tax in times of economic hardship, appears to only serve to worsen the underlying economic situation (Creighton, 2010), and they disproportionality impact low income households in society. These taxes reduce the disposable income of the poor, leaving them with less money to spend on healthier items, which in turn makes it difficult to prioritise their long-term health (Morse, 2009).

It is important to consider that, if a government proposes to increase tax revenues from such a sin tax, then the government must consider sin taxes can also incentivise tax avoidance, either illegally through the enhancement of the black-market economy or legally through cross-border purchases (Liu, 2018).

Contained in the literature is general conclusion that the demand for soft drinks is inelastic. Colantuoni and Rojas (2015) conclude with the statement that their research casts some doubt whether price elasticities should be used to form counterfactuals for how consumers might react to price increases.

While Colchero and Guerrero-Lopez, Molina and Rivera, (2016) used a different approach in their study of beverages sales in Mexico before and after implementation of a sugar sweetened beverage tax, using sales data from the monthly surveys of the manufacturing industry, through an estimation of ordinary least squares models to assess changes in per capita sales of SSBs, while also adjusting for seasonality and interestingly incorporated the global indicator of economic activity. Their research found that a tax on sugar sweetened soft drinks was associated with a reduction per capita sale of SSBs. However, they issued caution as to the effectiveness of the tax, and that it should be evaluated in the medium and long term.

Prior to this research, Gustavsen and Rickersten (2011) used a quantile regression approach, which involved using a data set that included observations, and distribution of annual per capita purchases of sweetened soft drinks of Norwegian households. Quantiles are points on a cumulative distribution function of a random variable. Prior to the research taking place, back in 2006, Norway held the position of the third highest per capita consumer of carbonated soft drinks. It was found that light and moderate drinkers will reduce their consumption, but it was uncertain whether heavy drinkers would change consumption in relation to soft drinks.

Theoretically, the only reason for imposing a special tax on a product is on the basis that the product creates what economists call a negative externality. Proponents of taxes on SSBs, claim that obese people create a negative externality due to their lower levels of

general health and related conditions attributed to their health condition, therefore, proponents claim that taxpayers and insurance holders pay for the actions of obese people due to the increased cost to the health system (Andreyeva, Chaloupka and Brownell, 2011). There are limitations to these findings, as they don't consider how much sugar is directly attributed to the healthcare problem. What follows is an outline of alternative measures to be considered in place of a sin tax.

## **Alternatives to a Sin Tax**

### **Outright Ban**

Outright bans of the sinful good or service is a method that can be adopted by the government to have an impact on an underlying 'sin' product. Although this is an extreme measure, according to Liu (2018) it has been introduced successfully in the past, most notably in North America during the prohibition of alcohol. The prohibition of alcohol in North America decimated a full industry as from 1916 to 1926 over 1300 beer breweries, and over 85% of alcohol distilleries, closed, resulting in federal tax revenues dropping from \$365 million to less than \$13 million (Shrestha and Markowitz, 2016). It is important to highlight that it did have an impact on the health of the nation, resulting in a decline in alcohol related deaths; post prohibition, alcohol consumption was far lower per capita, with consumption levels not rising to pre prohibition days until the 1970s (Blocker, 2006). This option would not be suitable for the Irish Government on many levels, as firstly, it would impinge on the public's right to free choice and, secondly, it would have a negative economic impact due to the large number of people employed directly or indirectly within the soft drinks industry. And much more indirectly, if an outright ban was introduced, it would have a significant negative impact on the Irish economy.

### **Improved labelling of Sinful Goods**

There have been calls for manufacturers of soft drinks to feature health warning levels directly on products. Falbe and Madsen (2017) discuss a campaign named 'live sugarfeed', which was a multiplatform media campaign to discourage consumption of sugar sweetened beverages. This campaign had similarities to previous anti-smoking campaigns,

and targeted rural, low-income regions of the United States. The results indicated there was a decline of sugar sweetened beverages sales of 3.4% over a 15-week period. This method of influencing a sinful good may be perceived as less Pigouvian, as it is the direct consumer who makes the decision, therefore, not all consumers are penalised.

### **Consumer Behaviour**

When considering consumer behaviour in relation to buying or the consumption of sugar sweetened soft drinks, it is important to consider how behaviour affects the decision-making process. Ajzen's (1991) Theory of Planned Behaviour (TPB) is an individual level health behaviour theory that has been used to understand behaviour around sugar sweetened drinks consumption (Zoellner, Krzeski, Harden and Cook, 2012). The (TPB) states that a person's behaviour can be predicted by intention and perceptions of behavioural control; also, indirectly influencing behaviour can include subjective norms, attitude, and perceived behavioural control. In an investigation to understand soft drink consumption using the Theory of Planned Behaviour, Kassem, Lee, Modeste, and Johnston (2003) found that intention to drink soft drinks is influenced by the attitudes, subjective norm, and behavioural control. This research supports other studies that used the theory to research consumer behaviour in adults (Godin and Kok, 1996). There are limitations to the theory, as it does not consider the time frame between "intent" and "behavioural action", which must be considered in relation to soft drinks, as these are sometimes viewed as an impulse purchase.

Furthermore, it is important to consider the "law of demand" as one of the most applied theories used by economists to predict consumer behaviour. It measures consumers' sensitivity to price, which is commonly referred to as the "price elasticity of demand" and indicates the proportional change in demand, given a change in price. Therefore, increasing the price of unhealthy soft drinks by taxation will reduce consumption of the taxed product and the behaviour of the broad population level (Powell, Chriqui, Khan, and Wada, 2013). Therefore, the higher the tax on an item, the less appealing it becomes to consumers (Creighton, 2010).

Extensive research has demonstrated that in relation to smoking and drinking, higher taxes prevents and promotes cessation among current users, reducing frequency and intensity of consumption among continuing users, and deterring relapse among former users (Andreyeva *et al.*, 2011). In contrast, Besley and Rosen (1999) estimate that an increase in soft drinks tax rates leads to an increase in the price of soft drinks and suggest that this is “over shifting” of the tax burden is the result of imperfect competition in the soft drinks industry.

However, consumers are now more brand loyal, and such an increase in taxation may not deter consumers from purchasing the same product. To support this theory, Degeratu, Rangaswamy and Wu (2000) found that consumer choice of soft drinks is driven by both product and consumer characteristics. Furthermore, Pulligadda, Kardes and Cronley (2016) conducted extensive research from previous studies on consumer purchasing behaviour and their findings clearly show that consumers are willing to pay a higher price, as they are loyal to their chosen brands.

Supporting this, Allender and Richards (2012) further show that less loyal brands are promoted more frequently than stronger brands, and this demonstrates that loyal consumers are willing to pay a higher price for a particular branded product. As highlighted earlier, given imperfect market competition, the theory postulates that taxes can lead to price increases, but the extent to which prices increase relative to the tax rate (“pass through rate”) depends on factors such as consumers’ responsiveness to price change; however, this may vary in different socio-economic settings (Nakhimovsky *et al.*, 2016; Afshin *et al.*, 2017).

In direct contrast to these findings, research findings using systematic scoping of evidence of specific interventions to behaviour change, Shemilt, Hollands and Marteau (2013) found largely equivocal evidence to suggest that the public health case for using economic instruments to promote behaviour change may be less compelling than proponents have claimed.

## Substitutes

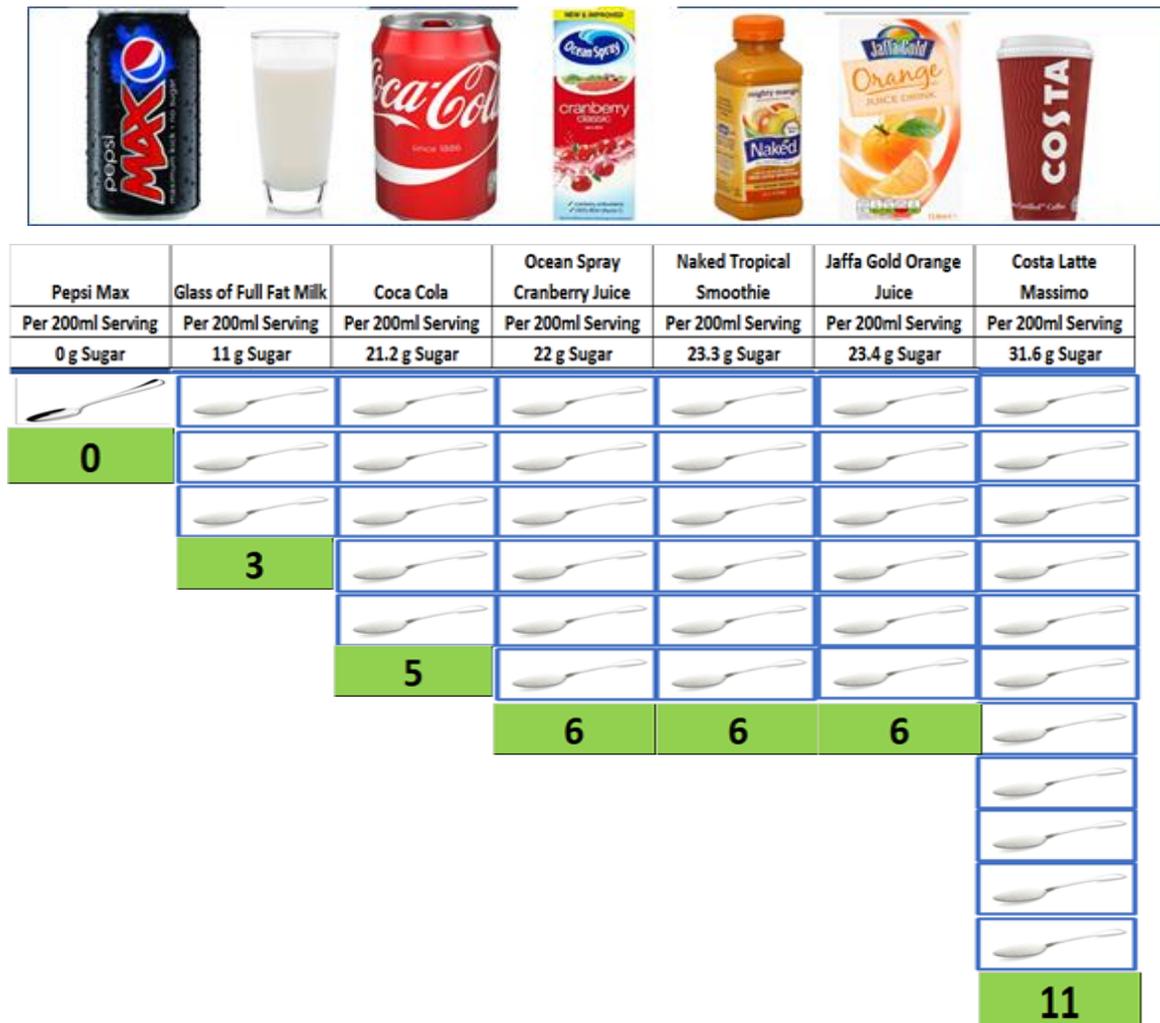
With any increase in price, it is important to understand the substitution effect on consumers' buying patterns, with overwhelming evidence indicating that, with subtle cues, consumers' consumption behaviour can be influenced (Finkelstein, Zhen, Bilger, and Nonnemaker, 2013). Subtle cues may have an impact on sugar intake as taxes do reduce consumption, but consumers tend to perfectly substitute soft drinks consumption for other high calorie sources (Drenkard, 2013). This is further evidenced by Cobiac *et al.* (2017) indicating there are less conclusive results related to the consumption of substitutes.

There is econometric evidence to suggest that increasing soft drinks taxes will cause substitutions toward other non-taxed goods (Runge and Johnson, 2011). Equally, Couch (2001) found that any health gains from large taxes on soft drinks would be largely offset by increased calories from other beverages, such as pure juice or milk. For example, there is evidence to show that taxes on soft drinks lead some people to increase their consumption levels of beer, which in most instances are more calorific (Drenkard, 2013).

Through a quasi-experimental study, Nakhimovsky *et al.* (2016) found that milk was in fact a complement and conflicts with another report that does not detect a relationship between milk and sugar sweetened drinks. They argue that on a 1-for-1 substitution of milk for soft drinks, when reviewing this on a per volume basis, the same substitution consumption levels are unlikely, leading to the view that there would be no nutritional benefit.

To address the increasing levels of obesity, an increasing number of countries are implementing a dual initiative, which includes taxes on unhealthy foods and drinks while simultaneously introducing a subsidy on healthier items such as fruit and vegetables. Where this has taken place, results indicate that only the sugar tax led to improvements. The subsidy on fruit and vegetables did not largely increase consumption levels. Due to these findings, Cobiac *et al.* (2017) does not recommend a fruit and vegetable subsidy as an intervention, as results suggest that it may lead to increased costs and no net health benefit for the population. Conversely, recent studies undertaken by Afshin *et al.* (2017) show that a 10% decrease in the price of fruit has an impact on lowering adiposity.

A subsidy on bottled water may be a better approach, as this is a more comparable healthy substitution for fruit and vegetable, but there are still significant research gaps in relation to complementary items for sugar sweetened beverages, for example, fast food is a high calorie attribute. Nakhimovsky *et al.* (2016) suggest a more accurate approach could be based on estimating the potential unintended consequences of substituting sugar beverage with alcohol and applying longitudinal data and quasi-experimental designs to trace the effects of this substitute on people’s health over a designated period.



**Figure 2 - Examples of substitute beverages available to consumers in Ireland**

Source: Safefood.EU (2018); Costa (2018)

**Reformulation**

Gornall (2015) outlines that, with the growing threat of regulatory action on sugar-sweetened beverages, companies are responding to this threat through influencing

scientific research and equally the reformulation of products which will avoid any sugar tax (Borges *et al.*, 2017), while Cobiac *et al.* (2017) indicate that this should be a positive development in relation to the health prospective as they pose less risk to health versus sugar drinks.

For example, companies have increased the range of artificially sweetened beverages (ASB's), and these have replaced the traditional high sugar content artificial sweeteners that contain little or no sugar (Borges *et al.*, 2017; Hendriksen and Tijhuis, 2011). These beverages have emerged as an important alternative to maintain sales and revenue for large soft drinks organisations, with artificially sweetened drinks now accounting for 25% of the soft drink market globally (Borges *et al.*, 2017).

Scientists are divided in their views on the issue of artificial sweetener safety, with a large number of studies concluding that ASBs are “safe under all conditions” to “unsafe” at any dose (Tandel, 2011). Recent evidence suggests that substituting sugar sweetened beverages with non-nutritive sweeteners, not only fails to prevent disease, but is associated with an increased risk for some health outcomes associated with sugar-sweetened beverages (Swithers, 2016). The major artificial sweetener used in soft drinks is called Aspartame, and this has links to health effects such as cancer and epilepsy. However, as part of their findings into the health effects of artificial sweeteners, Hendriksen and Tijhuis (2011) concluded that there is insufficient evidence to this link. Furthermore, they call for more detailed research into the benzoic acid content of drinks, which may have an impact on health. More research on this topic needs to be undertaken before conclusive findings can be provided linking ASB's to negative impacts on people's health. Until this point in time, there does not appear to be sufficient evidence for a similar sugar related tax to be introduced on products that contain ASB's.

### **Government Intervention**

As indicated by O'Donoghue and Rabin (2006), intervention may be used to correct self-control problems, but they argue that such paternalistic policies may help people who make normally short-term errors (i.e. consume more than they plan), while having little effect on those who are fully rational. As highlighted earlier, consumers do not always

comprehend information in relation to products that are harmful to them. The recognition of tobacco as a health hazard and the effectiveness of tobacco control policies and programmes to reduce tobacco use is rated as one of the top 10 achievements in public health during the 20<sup>th</sup> century (CDC, 1999). Supporting this, Cobiac *et al.* (2017) calls for a legally binding global convention around diet, like the World Health Organizations Framework Convention on Tobacco Control; implementing this can help to support and protect government rights to implement taxes and regularity measures to improve public health.

An introduction of a sugar sweetened beverage tax will raise considerable revenue for governments (Fletcher *et al.*, 2010; Creighton, 2010). However, leading economists have called into question the very justification for such a tax, as they only serve to stifle individual choice and free enterprise (Creighton, 2010).

Drenkard (2013) argues that such policies are a blanket policy that would affect all consumers, and that many people enjoy soft drinks and make their own adjustments in their diet elsewhere to maintain a healthy lifestyle. It is not surprising that research has found that this tax is viewed as regressive (Finkelstein *et al.*, 2013; Fletcher *et al.*, 2010), as lower income households spend a larger share of their food budget on sugar sweetened beverages (Fessenden, 2016; Drenkard, 2013; Creighton, 2010). Furthermore, lower income households spend a larger percentage of their income to absorb the introduction of a tax, compared to their wealthier counterparts. Where in contrast to income tax, which incorporates progressive features that correlate with income level and the ability to pay, a sin tax simply lacks this element in its formation (Hoffer *et al.*, 2017). In contrast, a citizens jury in Australia favoured taxation for sugar sweetened beverages (Cobiac *et al.*, 2017). This may support the perspective that sugar sweetened taxes are more effective in developed countries, as the evidence shows that consumers are more responsive to price changes than in developing countries (Nakhimovsky *et al.*, 2016). However, findings from Denmark indicate that support for new commodity taxes are low, and high public or political support is likely to be required for taxes to be initiated (Wright, Smith and Hellowell, 2017). Whereas Liu (2018) further supports the view that public opinion may be changing, with respect to acceptance of non-traditional sin taxes.

Creighton (2010) points out that the ability to tax should not be used as a mechanism for government to bring about social change in society, and government is not justified in excessively taxing individual choices, such as what to eat, simply because it disapproves of the activity. Nakhimovsky *et al.* (2016) challenges that more empirical research and monitoring of industry is required to effectively respond to health-related taxes on SSB's, as these are required to help policy makers ensure that the increase in prices are sufficient to reduce population obesity outcomes. However, Liu (2018) discusses ways in which governments may improve consumer access to healthier substitutes by using incentives to increase purchases of healthier products.

### **Manufacturers' Response**

The soft drinks industry does not welcome policies that steer consumption away from profitable product, particularly with the growing threat of regulatory action on SSBs (Cobiac *et al.*, 2017). Companies and corporations are responding in various ways, including promoting sports and physical activity events and adopting social responsibly strategies. According to the Irish Beverage Council (2017), its members, through reformulation of products and innovation of product with less or no sugar and fewer or no calories have removed 10 billion calories from the Irish national diet from 2005 to 2012. Coca Cola, one of the largest producers of soft drinks in the world, has provided financial support to scientists to promote the argument that weight conscious Americans are overly fixated on how much they eat and drink while not paying enough attention to exercise (Connor, 2015). Furthermore, these large firms are using financial power to promote information that distracts and confuses the public and also to lobby politicians (Cobiac *et al.*, 2017; Briggs *et al.*, 2013). Finkelstein *et al.* (2013) cites that advertising for high processed foods makes up the second largest share of all advertising revenue in the USA. This has led to calls from proponents of a sugar tax to also encompass a restriction of marketing for SSBs (Andreyeva *et al.*, 2011).

## Health Benefits

There is significant evidence that shows that a reduction in sugar intake leads to lower obesity levels. Drenkard (2013) and Gustavsen and Rickertsen (2011) both agree that high consumption of sugar-sweetened drinks will result in adverse health problems. Their results suggest that light and moderate consumers of soft drinks are more responsive to price than heavy drinkers, and indicate that with heavy drinkers of SSBs, the predicted health benefit effect among heavy drinkers is larger but uncertain; this can only be determined if reduced purchases are replaced by increased intakes of water.

Conversely, Fletcher (2010) highlights that reducing soft drink consumption may lead to improvements in other areas of health such as dental health. Cobiac *et al.* (2017) also emphasise how there are differences in the magnitude of health gains coming from sugar taxes. However, there is an inconsistency with this argument, as Hendriksen and Tjihuis (2011) found there is insufficient evidence that sugar sweetened beverages may contribute to a high glycaemic load, which is a factor in pancreatic cancer. However, the results from epidemiological studies are inconsistent and the study also found that there is a limited number of epidemiological studies to show the intake of sugar sweetened drinks is associated with the development of type 2 diabetes. The study also found that behavioural problems from sugar intake are also insufficient. Nevertheless, the study did report that through several trials and longitudinal studies, reducing sugar intake has a positive effect on reducing dental caries. Andreyeva *et al.* (2011) supports this view with the case that the impact of SSB taxes on weight outcomes are not clear and that existing research finds little or no impact of existing taxes having an impact on a person's body mass index or obesity.

According to Fletcher *et al.* (2010), soft drink consumption is the single largest contributor of energy intake in the North America United States, with varied claims as to how much this contributes to the total percentage of calories consumed, with highs of 15% and as low of 7% being reported (Creighton, 2010). In contrast, obesity and overweight rates are far higher in North America, compared to other countries (Nakhimovsky *et al.*, 2016).

The reality of these taxes is that even if revenue is funnelled into the health care industry, to mitigate the costs of poor health, the taxes fail to support the types and broad changes

they seek and how there are differences in the magnitude of health gains coming from sugar taxes (Cobiac *et al.*, 2017).

Creighton (2010) highlights that for a tax scheme to be successful and generate enough revenue to fund the health care plans the government desires, the rate would need to be so high that it would prevent most consumers from affording the desired items. Powell (2013) supports the view that there should be an offer of help to quit, as used to change attitudes to smoking.

From the literature review, which has provided insights from studies, analyses, investigation, and debates, there are mixed views as to the impact and influence of such a tax. With the lack of literature underpinning any longitudinal research undertaken, the full impact of such a tax is still uncertain.

### **Current Gaps in Research**

The scope of the study will encompass the current gaps in research related to the introduction of tax on sugar sweetened drinks in Ireland but include countries that have implemented a form of sugar tax. As noted, there are significant gaps in the research as to the nature and extent of substitutions with other beverages (Zheng, Allman-Farinelli, Heitmann and Rangan, 2015; Manyema *et al.*, 2014; Briggs *et al.*, 2013).

For example, a 200ml serving of full sugar cola contains approximately 21.2 g of sugar (equivalent to 5 spoonful's of sugar (SafeFood, 2018)), while substitutes such as fruit juices (which are sugar sweetened drink (SSD) tax exempt) are perceived by consumers as healthier options (Salois and Reilly, 2014; Labrecque and Charlebois, 2011). But, in fact, a 200ml serving of a high juice content substitute can contain approximately 23.4g of sugar (equivalent to 6 spoonsful of sugar) (SafeFood, 2018), whilst another substitute such as coffee, can contain approximately 36.6g of sugar per 200ml serving (Costa, 2018). The author has identified a significant gap in the research in relation to product reformulation by soft drink manufactures in advance of a SSD tax being introduced.

Existing obesity related surveillance systems are incomplete and poorly integrated in response to environmental influences which impacts on diets, activity, and weight ability (Andreyeva *et al.*, 2011). Although studies have indicated that introducing a tax on sugar sweetened drinks does have an impact on reducing sugar intake and in turn reducing weight, the studies fail to take into account the reduction in physical exercise and the impacts of technology (Gustavsen and Rickertsen, 2011; Fletcher, 2010; Jacobson and Brownell, 2000).

Other gaps within the research include the lack of substantial data collected in relation to consumer behaviour. Most studies reported sales data as a tool for analysis but fail to acknowledge that consumers may not always consume all beverages sold (Afshin, *et al.*, 2017). Additional factors highlight that some studies did not adjust for variables that will have an impact on soft drinks sales, such as the temperature in countries during the data collection, which would skew people's purchasing behaviour.

Another weakness with the literature is the failure to analyse the impact that advertising and promotion may have on consumption of beverages. One of the major concepts of marketing is the influence of price and promotion, and as part of most studies undertaken, there was a failure to investigate if the soft drinks companies increase advertising spending for campaigns and if there was an increase regarding price promotions to drive more purchases. There is also a significant gap in relation to substitutes that lower the price of less energy-dense healthier beverages such as water. It is possible that drink manufacturers and or retailers increase their marketing activity and increase investment with regards to promotions in the time frame around new taxation by governments, leading to a significant gap in research in this area.

The final gap relates to consumers and their perceptions when it comes to considering the sugar content of beverages to make an informed decision, especially if this decision relates to choosing a beverage to improve overall health or reduce sugar intake. There is little research into this area, with most research relating to either shifting consumption of SSDs to ASBs or, in some cases, switching to beer (Drenkard, 2013).

## **Conclusion**

There is a clear link between sugar intake and soft drink consumption, which in turn results in a high calorie intake. Taking this into account, this can result in people becoming overweight or obese. It is also clear that the world has an obesity epidemic and strong action is required to solve this crisis, where Governments have failed in the past to introduce steps to shift behaviour sooner, as indicated earlier with prohibition and taxes on cigarettes. Governments are now taking punitive measures to ensure better health and welfare, and the rising costs mounting on healthcare services.

The next section will discuss the research questions and objectives that have been set out based on the on the literature review.

## Research Objectives and Hypotheses

From the review of the literature, the main research question and objectives have been identified.

### Overall Research Objective

*Will the introduction of a sugar tax on soft drinks have an impact on Irish consumer buying behaviour?*

### Research Objectives and Hypothesis

**Objective 1 - Identify if consumer behaviour has shifted since the introduction of the sugar tax on sugar sweetened soft drinks.**

**Purpose** - Empirical studies indicate that an increase on the price of soft drinks can lead to a change in behaviour (Wright et al., 2017; Nakhimovsky, 2016). The objective is to identify if the introduction of a tax on sugar sweetened soft drinks has caused a shift in Irish consumer buyer behaviour.

- **H1 - Since the introduction of a tax on sugar sweetened soft drinks, Irish consumers have shifted their buying behaviour when buying sugar sweetened soft drinks.**

**Objective 2 - To investigate the main factors that have influenced the shift in consumer behaviour regarding the purchasing of soft drinks?**

**Purpose** - To identify the main factors that have influenced the shift in consumer behaviour since the introduction of the sugar tax on soft drinks and understand if the research is

aligned or contrasts with existing literature on whether taxes can reduce consumption of targeted products (*Wright, Smith and Hellowell, 2017*).

- **H2 – The shift in consumer behaviour regarding purchasing of soft drinks is down to several factors and not just price.**

**Objective 3 - To explore the role of “price” when it comes to the buying process of soft drinks.**

**Purpose** - To explore the role of price when it comes to the buying process of soft drinks. With the sugar tax’s aim to increase the price of a soft drink on a consumer, does the price take a role in the decision-making process. Do consumers look or think about the price of a soft drink? And, if so, is this impacting the decision-making process? This objective aims to identify if Irish consumers are changing behaviour and are they as reactive to price as other countries identified in the literature (*Afshin et al., 2017; Falbe et al., 2016; Hoffer, 2014*), in the same vein that *Pulligadda et al., (2016)* found that consumers are willing to pay a higher price as they are loyal to their chosen brands. Also highlighted by *Fletcher et al., (2013)* that for a tax to be effective, it would need to be a hefty tax to shift behaviour.

- **H3 - The price of a soft drink plays a significant role for Irish consumers when it comes to purchasing a soft drink.**

**Objective 4 - To determine if Irish consumers take into consideration their consumption of sugar when purchasing soft drinks.**

**Purpose** - To explore how Irish consumers view their sugar intake when purchasing a soft drink and drawing on the concept of addiction provided by *Wang et al. (2016)* that shows that sugar has addictive qualities, therefore it can be assumed that consumers will not consider sugar content regarding soft drinks. As indicated earlier, *Degeratu et al. (2000)*

indicated that consumer choice of soft drinks is driven by both product and consumer characteristics, therefore sugar content may not be a contributory factor in the decision process.

- **H4 – The sugar content of soft drink has an influence on the decision-making process of the Irish consumer.**

**Objective 5 - To determine if the perceptions of total sugar content of beverages is accurate, therefore it can be determined that Irish consumers are aware of sugar intake when buying beverages.**

**Purpose** – To explore the perceptions of Irish consumers when it comes to sugar intake when buying or consuming beverages. As Ireland moves towards becoming the most obese country in Europe (WHO, 2015), the Government has introduced a sugar tax on sugar sweetened drinks. However, findings from the Irish Beverage Council states that only 3% of the nation's total calorific intake is coming from sugar sweetened soft drinks (IBC, 2017). This objective aims to explore if Irish consumers' perceptions of sugar content in beverages is in fact accurate, as a failure of consumers to be accurate could lead to a shift from sugar sweetened soft drinks to a more sugar dense beverage.

- **H5 – Irish consumers' perceptions of sugar content in beverages are accurate to help them make an informed decision of sugar intake.**

The next chapter will discuss the methodology used for this study.

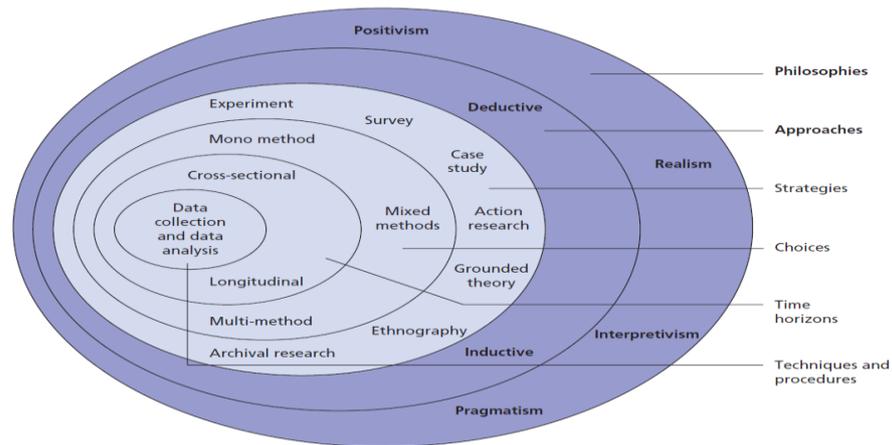
# Methodology Chapter

## Introduction

Having reviewed and analysed existing and most recent literature relevant to the research topic, this chapter will define how primary research will be conducted. The chapter will illustrate the methods used to gather the information, how the data is analysed, and highlight any research limitations. Underpinning this will be the theoretical assumptions that relate to the research. According to Saunders, Lewis and Thornhill (2015) this chapter relates to the theory behind the research and how it can be justified.

Through the following sections of this chapter, the research choices will be detailed and justified as the most appropriate method of research after considering all other options available. Through this process, the problem is analysed through steps to ensure that the research shows a relationship to the objectives of the problem. Vital parts of the research include the following: the research problem definition, research objectives, proposed methodology and structure, philosophy, approach, strategy, choice, time horizon, data collection, procedure, and research ethics. To complete this section, the research instrument used will be defined, as will the rationale for using it. Finally, a limitations section will highlight any shortcomings in the process.

A key aspect of research is to manage the methods and ensure that they align with the main objectives. The 'Research Onion', as presented by Saunders *et al.* (2015) illustrates the main elements related to the research methodology, and the motivation behind the research. It is presented in the form of an "onion"; the research problem is the centre and to get to the research problem many layers need to be 'peeled away'. These layers are vitally important in determining the research methodology to be used in the research project.



**Figure 3 - Saunders Research Onion**

Source: Saunders *et al.* (2015)

What we know about research is that there are many different methods of research processes and classifications that can be used. Domegan and Fleming (2007) state that the research process is compiled of various stages and tasks that the researcher undertakes to collect and report valid and reliable information. The classification developed by Saunders *et al.* (2015) is preferred, as it provides a tested framework for the complete research process to meet the objective of the research.

The primary goal of this study is to ascertain the views of Irish consumers towards purchasing and consuming soft drinks and whether the introduction of a sugar tax will have an impact.

### **Research Problem Definition**

It is important to consider the selection, adaption, and development of a suitable theoretical framework that frames the design of the research (Malhotra and Birks, 2007). As Kothahi (2005) reminds us, a proper definition of the research problem will enable the researcher to be on the track to investigate the problem more effectively. Furthermore, Blumberg (2010) states that the importance of a problem statement should be specified to apply the research adequately and separate the primary research problem from associated ones.

## **Research Philosophy**

Research philosophy is a highly important issue in a research study, as it helps to develop the logical, rational, reality-based thinking to analyse the viewpoints gathered in the data collection method. Johnson (2014) asserts that the importance of the relationship between theory and research cannot be underestimated. Other writers such as Quinlan (2011) and Jankowicz (2005) hold the view that that it is the philosophical framework that underpins every research project, and that it indicates the worldview in which the research is situated. Both researchers emphasise that research is about creating new knowledge and, through this, its development is based on strong judgement of what is known and unknown and constitutes the epistemology concerns about acceptable knowledge in a study.

As discussed, the philosophical framework underpins every research project, but it also relates to the way that the assumptions underpin the research strategy. This can be broken down into three areas - Positivism, Realism, and Interpretivism.

Positivism sees society as shaping the individual. As discussed above, introducing a sugar tax can have an impact on individuals and on shaping individual responses, with a structured questionnaire framing the research, this will allow for rejection, or acceptance of the set hypotheses. This will be important, as, with the tobacco industry, a significant shift in smoking can be attributed to human behaviour due to the social unacceptability of smoking in public. Sanders *et al.* (2012) addresses the significant importance for a researcher to retain an emphatic stance with relation to positivism.

## **Research Question**

This paper's main research question is presented as follows:

**“Will the introduction of a sugar tax on soft drinks have an impact on Irish consumer buying behaviour”?**

## **Research Objectives**

Saunders *et al.* (2012) highlights that the objectives of the research should be formulated from the original research question. In the same vein, Saunders *et al.*, (2009), point out that the research topic must be accompanied by a clear set of objectives that the research must address. The research objectives of this study were:

### **Overall Research Objective**

*“Will the introduction of a sugar tax on soft drinks have an impact on Irish consumer buying behaviour”?*

### **Research sub objective 1.**

*“To investigate the main factors that influenced the shift in consumer behaviour in regard to the purchasing of soft drinks”*

### **Research sub objective 2.**

*“To explore the role of “price” when it comes to the buying process of soft drinks”*

### **Research sub objective 3.**

*“To determine if Irish consumers take into consideration their consumption of sugar when purchasing soft drinks”*

A considerable amount of literature has been published on consumer behaviour and how this can be easily changed. Recent evidence by Finklestein *et al.* (2013) suggests that, with subtle cues, consumer consumption behaviour can be influenced and can cause a shift in behaviour. Furthermore, in an investigation into the effectiveness of taxes on sugar sweetened soft drinks, Powell *et al.* (2009) provide evidence indicating that taxes on sugar sweetened soft drinks resulted in a reduction of consumption of sugar sweetened soft drinks. The studies presented thus far provide evidence that suggest that consumer behaviour can be influenced. This study aims to understand will the introduction of a sugar tax on sugar sweetened drinks have an impact on Irish consumer behaviour.

In his review of 'Fat Taxes', Creighton (2010) points out that the higher the tax on an item, the less appealing it becomes to consumers. However, Degeratu *et al.* (2000) applied indicated that consumer choice of soft drinks is driven by both product and consumer characteristics, while Pulligadda *et al.* (2016) reminds us that consumers are willing to pay a higher price, as they are loyal to their chosen brands.

In a systematic review of taxes on sugar sweetened beverages in middle income countries, Nakhimovsky *et al.* (2009) found that a tax may be more effective in middle income countries versus high income countries, given the evidence that consumers are more responsive to prices. Research objective 2 will attempt to apply and test this variable and explore the role of price when it comes to the buying process of soft drinks. It will seek to understand if consumers are aware of the price increase since the introduction of the sugar tax, and investigate whether consumers are shifting consumption due to the price increase. It also looks at whether salary has a link to buyer behaviour on soft drinks.

As was pointed out in the introduction to this paper, it has been identified that consumers may in fact be addicted to sugar in their diets (Westwater, Fletcher and Ziauddeen, 2016; Trivedi, 2010), and as far as sugar is concerned there is significant evidence to show that Irish consumers are exceeding the recommended daily amount of sugar. Research objective 3 aims to look at the Irish consumer and whether they take into consideration the amount of sugar contained in soft drinks. Does the sugar content of a soft drink have an impact on their buying behaviour? To develop this objective further, the research will incorporate a question with images of seven various beverages, where each participant will be asked to rate the estimated sugar content of each beverage. The results of this will indicate if consumers are aware of the correct sugar content in beverages and may lead to further research into the substitution effects of a sugar tax on soft drinks.

### **Research Strategy**

Saunders *et al.* (2009) highlight that it is important that the research strategy chosen for the study allows the researcher to answer the research question and meet the required objectives. This stage involves the discussion and justification of the chosen research strategy for the research. As noted by Saunders *et al.* (2009), it is important that there is a

clear distinction between strategy and tactics. The former is concerned with the plan for the research; the latter is about the finer detail of the data collection and analysis.

## **Research Design**

The research design that was deemed the most appropriate for this project and to answer the research question was quantitative research. The research design is the definition of the overall research study, thus, to understand the nature of the research design, it is important to understand the objectives of the research. This research is exploratory in nature. The benefits of this research is that it is effective in laying foundations that may lead to further studies. Sanders *et al.* (2012) maintain that this type of research is valuable for asking open ended questions, as it assists in discovering what is happening, gaining a deep understanding around the research problem. This method involves starting with a broad focus, but with further processes, it develops further and the focus narrows and will become more detailed, helping illicit strong responses to the questions.

Questionnaires will be used for data collection, in which each person is asked to respond to the same set of questions (Saunders *et al.*, 2009). Questionnaires are a well-established tool within social science research for acquiring information on participant social characteristics, present and past behaviour, standards of behaviour, and reasons for actions with respect to a topic under investigation (Bulmer, 2004). The structure of the questions will be mostly closed-ended questions, as these limit the respondent to the set of alternatives being offered. There will also be a small number of open ended questions, which allow for further probing and allow the participants to define, describe, or express an opinion (Saunders, 2015; Dillman, 2007).

## **Proposed Methodology and Structure**

Commenting on research, McGivern (2013) highlights 'if the research is completed correctly then it will be a success as the research can only be valued if it meets its objectives and its purposes'. To ensure that the objectives are achieved, it is vital that the research method procedure be researched and analysed in a thorough manner.

As explained earlier, quantitative data will be collected through a questionnaire, which will be developed through online software. The sample will be made up of Irish people, aged between 18 to 65 and over. The reason this cohort was identified is due to the incidences of soft drink they purchase and consume. These can both vary due to the nature of the product, as soft drink products can be purchased and consumed immediately as an 'immediate refreshment' or purchased in larger formats for consumption at home. To achieve the responses, the main data collection will target over 100 Irish supermarket and convenience shoppers. The advantages of a survey is the access to consumers from a wide range of backgrounds, age, and family size.

### **Questionnaire Design**

When using the questionnaire survey approach to research, it is important to consider two main concepts in questionnaire design: 'reliability' and 'validity'. Reliability refers to the consistency of a measure, whilst validity refers to its ability to measure what it is supposed to be measuring (Adams and Cox, 2008).

There is a consensus among authors that good questionnaire design is crucial to generate data that is conducive to the goals of the research, and understanding this can assist in ensuring data collected is reliable and robust (Saunders, 2009; Bulmer, 2004; and Creswell, 2003). It is important to use words familiar to all respondents, and avoid words with ambiguous meanings, catch words, or words with emotional connotations (Kothari, 2005). This view is supported by Bird (2009) who points out that the format, sequence, wording, and length need to be considered to ensure reliability, validity, and sustained engagement of the participant. To ensure these factors are met and to maximise response rates, the author, when designing the questionnaire, took into consideration the following steps, as indicated by Saunders *et al.* (2009):

- Careful design of individual questions;
- Clear and pleasing layout of the questionnaire;
- Explanation of the purpose of the questionnaire.

Foddy (1994) developed a framework for questionnaire design, with stages that must occur if a question is to be valid and reliable. It emphasised that the question must be understood by the respondent in the way intended by the researcher, and the answer given by the respondent must be understood by the researcher in the way intended by the respondent.

Questionnaire design and the set up of questions are considered important:

- Ensures that the main research objectives are considered when constructing questions,
- Ensures that all questions and answers relate back to the research objectives,
- Reaches a sample that is large enough to gather robust data,
- The questionnaire is clear, easy to navigate, and understand.

To achieve all the above, it was decided that the questionnaire would be web based. Online questionnaires allow for a low or no cost professional research tool, they offer simple functionality, they allow for complete control over the flow, design and structure by the researcher, and offer a simple easy to use survey tool for participants. They also offer a significant benefit in the fact that interviewer bias is eliminated, as the survey is completed by the solely by the respondent.

In his social exchange theory, Dillman (2007) identified that survey response rates depend on a combination of factors, including reward, trust, and costs. The research hypothesized the following: that ease and low cost (in relation to time taken to complete survey), origin of the survey, structure and length of survey and finally assurance of confidentiality are all influential factors in increasing web survey response rates. Dillman also points out that in covering the above steps it can portray professionalism on the part of the researcher. Furthermore, Saleh and Bista (2017) found that online surveys now yield significantly higher response rates than paper surveys.

## **Procedure**

A considerable amount of time was allocated to the questionnaire set up; all questions were drafted and scripted in Microsoft word. Attention was paid to simple language and wording of questions and ease of flow of question and sections, to ensure that participants in the study understood each question clearly. It was avoided making the questionnaire complicated or confusing, as this is likely to result in low response rates. To ensure valid and completed surveys, the questionnaire was designed to ensure it would take less than ten minutes to complete, as previous studies have asserted that shorter surveys have higher response rates (Liu & Wronski, 2017; Porter, 2004).

The estimated time for completion for the survey, according to Qualtrics, was 8 minutes. This estimation incorporates the open-ended text entry questions that may be completed with one-word answers or a paragraph depending on the participant. During the process, the open-ended questions had a forced response, with a minimum character count that limited one-word answers, but through the pilot testing, this was viewed as frustrating by testers, which may lead to participants exiting the survey before completing.

The survey was divided into four sections, with each section having a precise purpose and was related to the research objective. Each section was explained at the start in simple terms, to give participants an understanding of what was contained in the section:

- Introduction,
- Buying pattern,
- Sugar tax introduction,
- Buying behaviour,
- Price,
- Sugar content.

## **Building the Questionnaire**

Initially, SurveyMonkey.com was investigated as a survey tool; this is a free software used to complete online surveys. However, after some research, the researcher encountered

some major faults, as the software did not allow for filtering of questions or allow for control on the flow of questions, which would result in questions from a section on price appearing in a section on sugar, which could lead to lower response rates due to poor structure (Saleh and Bista, 2017). To achieve the required control over the structure and flow, the researcher would need to pay a subscription fee. After some further research, it was found that Qualtrics.com provided a free, professional survey tool that allowed the researcher full control over how the questionnaire would be built.

The software provided many additions such as forced responses to ensure that questions were answered and to avoid gaps in the data. It also allowed for structure around how different participants answered, for example, should a participant answer yes, the software would ensure that the next question related to the response of yes, and if the response was no, the following question would relate to the no response. This allowed for continuous flow for the participant and ensured that they were not frustrated when answering the survey. Another benefit to the Qualtrics tool was that during the set-up stage, the researcher could preview the questions as to how they looked on a computer and on a mobile device. Furthermore, the Qualtrics tool allowed for the link of the survey to be distributed via email and through mobile applications such as text messages or WhatsApp if required.

## Pilot Test

Pilot testing refers to trial run or pre-testing of a research instrument done in preparation for the major study (Baker, 1994; Polit, Beck and Hungler, 2001). Furthermore, Saunders *et al.* (2009) state that the purpose of the pilot test is, to refine the questionnaire to ensure respondents will have no problems in answering the questions and therefore there will be no problems collecting the data. The first stage of testing was conducted through a printed word document to test the questions' structure and the flow of the stages through a sample of colleagues. This provided important feedback on the flow, framing of the questions, and structure. This feedback was then incorporated into the final set of questions.

The second stage of testing incorporated setting up the questions on the Qualtrics software. Once the questions, images, and flow was complete, this was then trialled by six

'typical' respondents and tested by two 'non-typical respondents'. The two non-typical respondents were work colleagues and, as the researcher works for a leading soft drinks company, the research felt that this data could be viewed as flawed and unreliable due to the knowledge around the sugar tax introduction. In addition, it must be highlighted, that the researcher decided not to distribute the final survey to work colleagues to ensure that data collected was robust and valid.

Of the six 'typical' respondents, the researcher observed two of these responses to ensure that the flow was as intended, to ensure the duration to complete the survey was accurate, and to highlight any problematic areas. This testing stage proved to be extremely valuable, as there were several problematic areas identified; an example was how the readability shifted on some questions when answered on mobile devices. The pilot testers were asked for feedback in relation to the following:

- Ease of access to open link
- Was the introduction and instructions clear?
- Time taken to complete survey?
- Where the questions easy to understand?
- How did they find the flow of the questions and the sections?
- How user friendly was the layout, with importance on the final question that had graphics?

Feedback was provided and there were concerns around the wording of questions, on how two separate questions felt like they were asking the same question, which caused confusion. Feedback was also raised on the issue of the minimum word count for the open-ended questions; this resulted in the researcher removing this step on these questions. The feedback was crucial and in turn minimal changes were made and the survey was then distributed.

## Administrating the Survey

Once the survey was completed and ready to be distributed, the Qualtrics software distribution section generated a hyperlink, which could be formatted to the researcher's requirements. Therefore, the researcher could attach the link to an email for distribution through personal email list using the snowballing technique and through a mobile application through a text message or WhatsApp, as the Qualtrics software allowed for respondents to answer survey through a mobile device. The cover email and cover message explained the nature of the research and highlighted that the survey was anonymous and confidential. Once live, the questionnaire was active for a two-week period.

## Research Approach

The research approach is a significant element to be considered for any research project, consisting of three techniques: Inductive approach, Deductive approach, and the Abductive approach (Saunders *et al.*, 2012). The relevance of the research achieves success through making correct choice of research approach. Research can be designed to develop a theory or test a theory. This research project will take an inductive approach. The inductive approach is used to explore the collected data for identifying the themes and patterns and to create a conceptual framework.

Several studies investigating the impact of taxation on soft drink consumption has resulted in a considerable amount of published studies describing the various methods of research conducted worldwide. Colantuoni and Rojas (2015) conducted a study into the impact of soda sales taxes on consumption and used evidence collected from two sets of scanner data. This was collated through datasets of the volume sold of a specific range and brand of soft drinks in two different American cities. The scanner data then incorporated income distribution, population size, and temperature, which can have an impact on consumption and buyer behaviour. The result of this study found that a price increase on soft drinks in the two cities, Maine and Ohio, did not decrease consumption.

This approach helps to build theories of verification. The aim of this study is to understand the buying behaviour of Irish consumers, post the introduction of a sugar tax on soft drinks. To obtain this insight, data collected from a questionnaire survey will be analysed and

interpreted to understand if the introduction of the tax will have or has had an impact on consumer behaviour.

### Research Sample

Sampling techniques that can be used are divided into two types:

- Probability or presentative sampling
- Non- Probability or judgemental sampling.

This research was conducted using probability sampling, as this is commonly used for survey-based research and can assist in making inferences from the sample about the population. As this research is based upon the impact of a sugar tax and the behaviour of the Irish consumer, the researcher deems this the best fit for the research.

The target population to be included in the sample will be comprised of Irish consumers, both male and female. Research conducted by Bordbia (2017) found that most of grocery shoppers in Ireland tend to be female; the gender bias has narrowed in the last decade, however. However, this research relates to overall grocery shoppers of which most of the purchases would relate to items for consumption at home. For this research project, impulse purchases must be considered, as O'Reilly (2011) found that soft drink sales were higher for impulse soft drinks rather than at home consumption purchases.

As indicated, the research sample will include responses from male and females from ages 18 – 65+. The reason behind this age cohort is to have an overall view of Irish consumers who are at all stages of the life cycle.

This research project also considers the social class of the sample group, as far too little attention has been paid to this. Therefore, the author highlights a gap in research, and this should be undertaken to understand if social classification and grouping have an impact on buying behaviour when it comes to soft drinks purchases. It is vital to secure a high response rate to gather a more informed and detailed data collection. The aim of the research is to gather up to 100 responses via an online questionnaire, as it must be noted that, according to Saunders *et al.* (2012), out of a population sample of less than 100, there is a high margin of error, which must be considered when reporting the conclusion.

The main objective of primary research is to collect details about a population of people. Two methods can be used, and these include a census and a sample. A census is where data is gathered from every person within a population, while a sample is a subset of the total population and is said to be representative of the whole population being sampled (Saunders *et al.*, 2009). Sampling techniques provide a range of methods that enable you to reduce the amount of data you need to collect by considering only data from a sub-group (Saunders *et al.*, 2009). The sampling technique was chosen due to nature and limitations of the research.

### **Time Horizon**

The time horizon relates to the time frame of when and how the research data will be collected, and also how it will be analysed. It is broken into two areas and leads to a separation between longitudinal and cross-sectional research. Longitudinal research is the study of change and development, where the study is replicated over a period, and changes and movements can be tracked. Adams and Schvaneveldt (1991) state that observing people or events over time gives the researcher the ability to control variables being studied. Cross sectional research is the study of a phenomenon at a particular time (Saunders *et al.*, 2015). For this research project, a cross-sectional study was undertaken, due to the time frame available to gather data being constrained.

### **Data Collection, Data Storage and Data Privacy**

All data collected in relation to this research will be stored in a password protected folder on a cloud-based storage file. This cloud-based storage is provided by the author's employer and usage is agreed by the employer. Survey results will be collected via an online process; details will be collected and stored correctly. Personal details will not be collected; reference will only be related to age and sex. Data privacy is an extremely important element of the research process, and, as indicated, no personal data will be collected.

## **Ethical Issues**

The researcher took careful consideration always to firmly observe the ethical guidelines as indicated by the National College of Ireland. Ethical issues are a very important consideration for a research project and relates to the rules of any research project being undertaken. With the research collection method of the survey questionnaire, no personal details will be collected; however, issues still need to be considered and the identity of the responses should not be disclosed at any cost. The questionnaire should be based on the main problem and sub objectives of the research project, and the respondents should be made aware of what the topic is related to before commencing the questionnaire.

To achieve robust data that can be used, all questions need to be worded to ensure that respondents can respond accurately without confusion. This in turn will illicit reliable results. The method of choosing respondents should be unbiased, as this will also ensure a more balance result in responses.

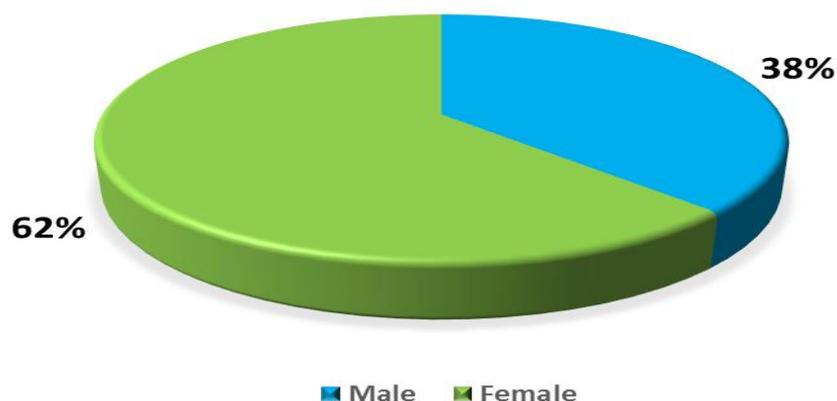
## Analysis / Research Findings

To provide the analysis and findings from the research questionnaire, this chapter will be divided into several sections, starting with an overview of the participants who took part in the research. The subsequent sections will each relate to the main research objectives and the results will then be used to answer the hypotheses.

### Descriptive Statistics

The targeted sample size for the research project was over 100 responses, as according to Saunders *et al.* (2012), out of a population sample of less than 100, there is a high margin of error that must be considered when reporting the conclusion. The total complete respondents for the research resulted in 117 completed surveys.

Questions 1 – 3 were aimed at gathering demographic information on the participants. Gender was the first demographic variable, as depicted in Figure 4. Of the 117 respondents, the gender split was 62% Female and 37% Male. While the aim was to have an even split of gender, there was a slight female bias. However, research has found that women are more likely to participate in surveys than men (Curtin, Presser, and Singe, 2000). That said, there is still a strong response rate to ensure reliability in the data.



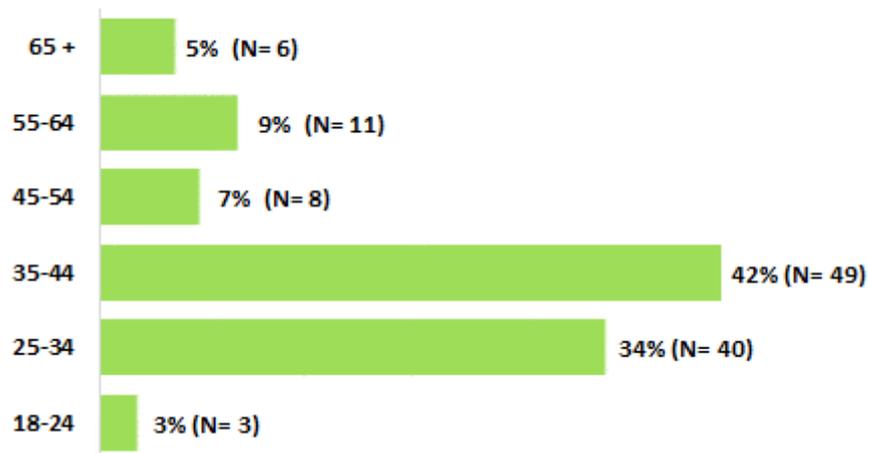
**Figure 4 - Gender Breakdown of respondents**

**Total number of respondents (N=117)**

		GENDER			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	44	37.6	37.6	37.6
	FEMALE	73	62.4	62.4	100.0
	Total	117	100.0	100.0	

**Figure 5 - Gender Breakdown - SPSS**

The research project set out to ensure that a random age set was sampled to ensure a mix of age groups were in the sample.



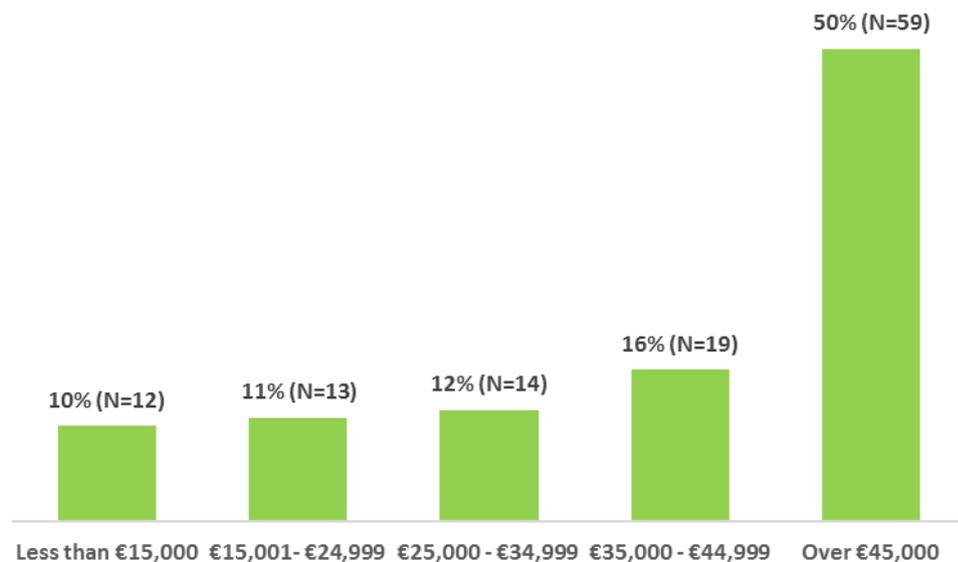
**Figure 6 - Age breakdown of respondents**

**Total number of respondents (N=117)**

		AGE			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	3	2.6	2.6	2.6
	25-34	40	34.2	34.2	36.8
	35-44	49	41.9	41.9	78.6
	45-54	8	6.8	6.8	85.5
	55-64	11	9.4	9.4	94.9
	65+	6	5.1	5.1	100.0
	Total	117	100.0	100.0	

**Figure 7 - Age breakdown - SPSS**

The third main demographic variable was salary range. It was important to consider salary, as the findings will serve to indicate that, if a respondent is on a high salary, is the price increase of soft drinks a factor. As indicated earlier, research has shown that sin taxes disproportionality impact low income households in society. According to the CSO (2018), the average annual salary in 2017 was €37,646, which indicates that over 50% of respondents received over the average salary, would this impact on results.



**Figure 8 - Salary range of respondents**

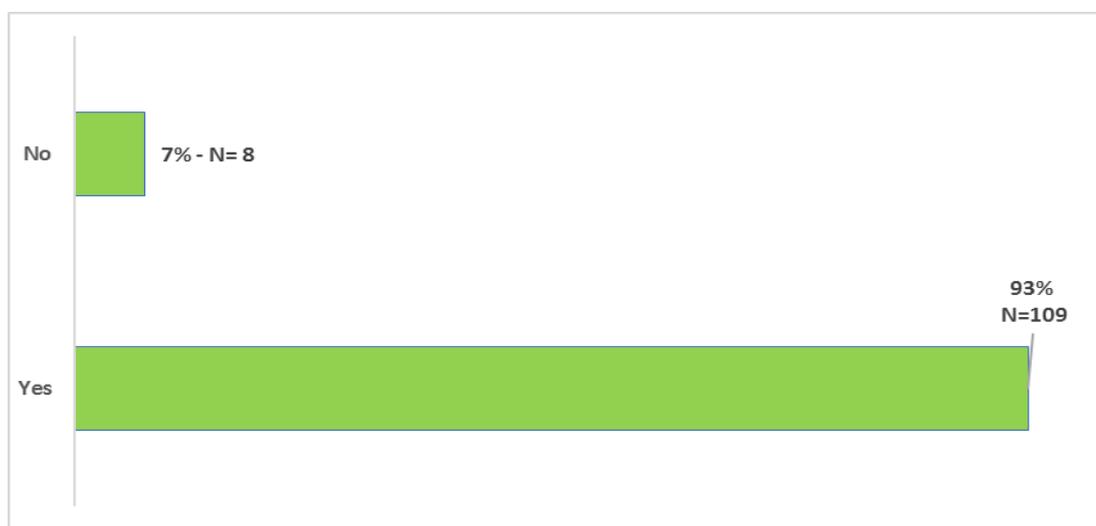
Total number of respondents (N=117)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 15,000	12	10.3	10.3	10.3
	15,001-24,999	13	11.1	11.1	21.4
	25,000-34,999	14	12.0	12.0	33.3
	35,000-44,999	19	16.2	16.2	49.6
	45,000+	59	50.4	50.4	100.0
	Total	117	100.0	100.0	

**Figure 9 - Salary Range - SPSS**

### Respondents' knowledge of Sugar Tax

The following is a brief analysis of what the respondents understood about the sugar tax. The question asked respondents if they were aware that a sugar tax was placed on sugar sweetened drinks, indicating a significant awareness of the sugar tax introduction.

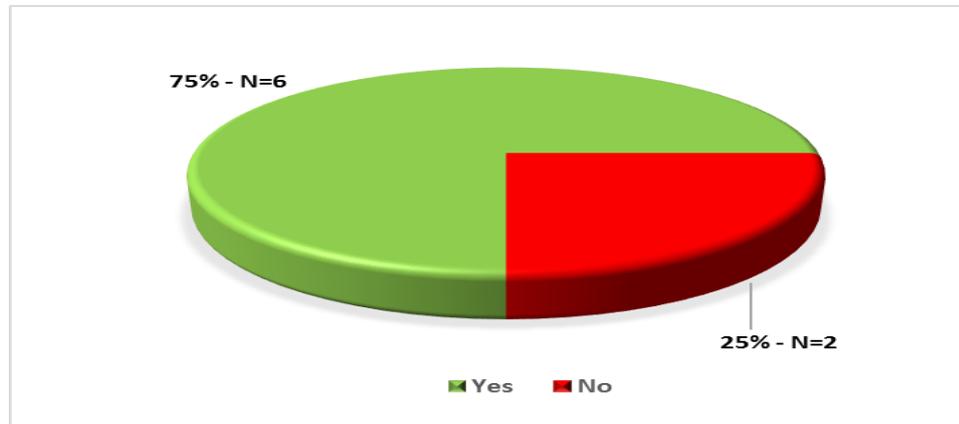


**Figure 10 - Sugar Tax Introduction**

**Total number of respondents (N=117)**

Of the 8 respondents that answered no, a follow-on question was asked; as they were not aware of the sugar tax, would they continue to buy sugar drinks in light of new awareness. Interestingly, 75% of respondents answered that they will continue to purchase sugar

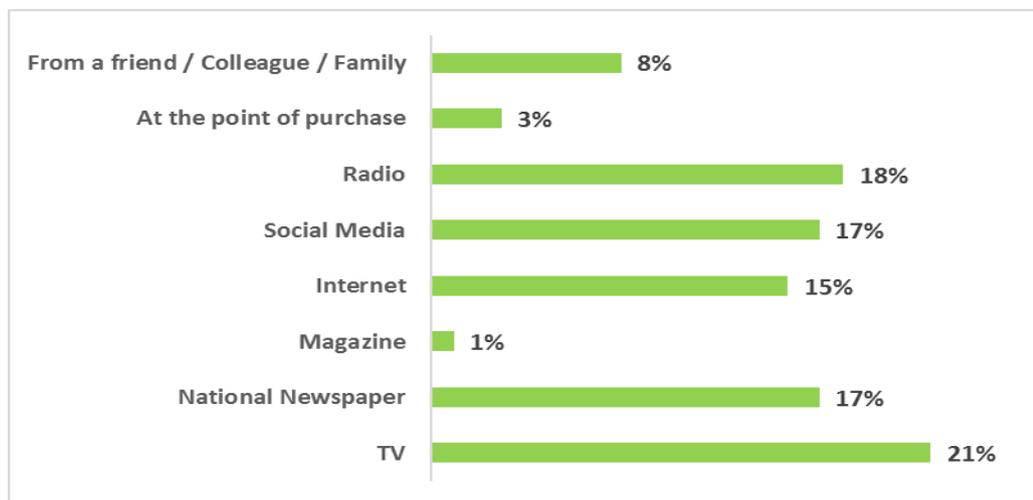
sweetened soft drinks. An open-ended question probed further to reveal why they will continue to buy soft drinks and found two themes, that they preferred the taste, and that they purchase very little for yes respondents, with the no indicating they pay 'enough tax'.



**Figure 11 - Will you continue to buy sugar sweetened soft drinks?**

**Total number of respondents (N=8)**

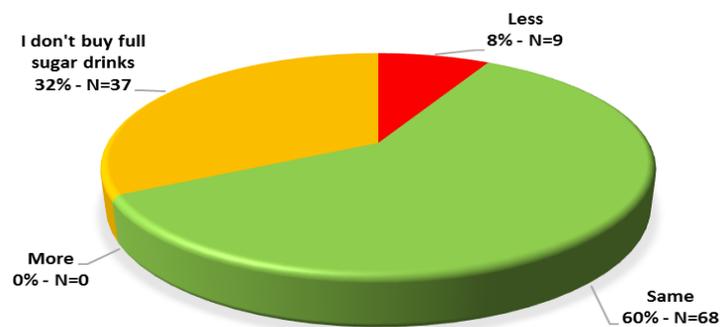
The question was asked regarding how they were made aware of the introduction of the sugar tax. The results follow on from awareness of tax, to show a wide range of areas of communication.



**Figure 12 - How were you made aware of the sugar tax?**

Additional analysis revealed that 66% of respondents felt there was not enough information provided by the government in relation to the introduction of the sugar tax, with 34% stating that there was. This contrasts with the 93% of respondents who stated they were aware of the tax. It is important to consider, the impact on behaviour, if more information was disseminated by Government.

Respondents were asked, since the introduction of the sugar tax, how much full sugar soft drinks have they bought. This question found that 60% still buy the same amount, indicating that the tax is not having an impact on purchasing behaviour, as only 8% stated that they had bought less sugar drinks.



**Figure 13 - Since introduction of Sugar Tax - Behaviour**  
Total number of respondents (N=114)

### Hypotheses Findings

### Analysis / Research Findings

To present the analysis and findings from the online questionnaire, this chapter will be divided into several sections starting with an overview of the participants who took part in the research. The remaining sections will relate to each of the research objectives and the results are then used against the hypotheses outlined.

The research investigated the respondents' purchasing and consumption history to understand the categories that the respondents are mostly aligned with. Taken together, it indicates that purchasing behaviour does not have an impact on consumption. 15% of respondents purchased soft drinks, but the same number of people consumed 4% more soft drinks. The aim of the sugar tax was to shift behaviour to make people buy less and in turn consume less sugar sweetened drinks. The significance of the findings indicates that the taxation of soft drinks may affect the purchaser, but the purchaser may not be the end

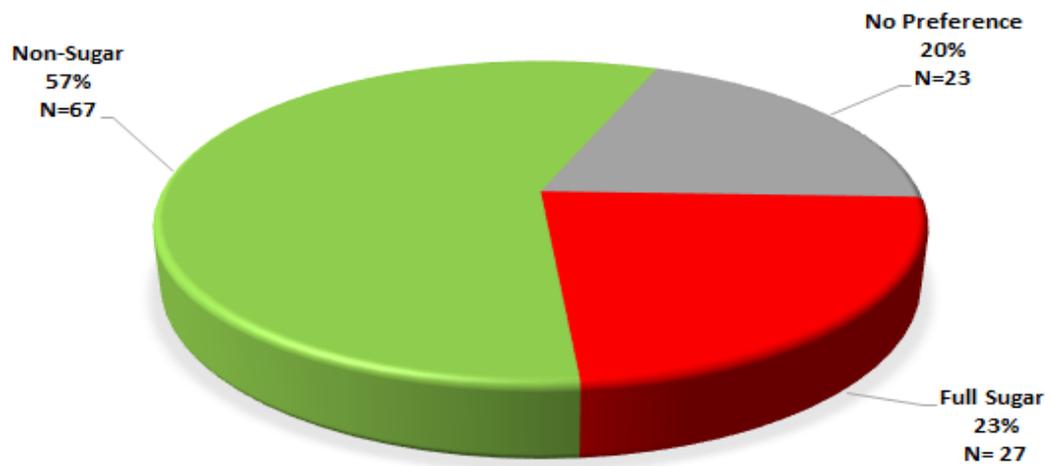
user, which could indicate that sugar intake may be passed onto the end user. Similarly, the findings indicate that 23% of respondents bought Energy / Sports drinks, which contain high sugars, but only 9% consumed these drinks. More research is required to better understand the difference between purchase and consumption and end user consumption.

**Table 1 - Purchasing and Consumption Behaviour**

Drink Category	Purchased in last 6 months	Consumed in the last 6 months	Variance
Soft Drinks	15%	19%	4%
Hot Drinks (Tea, Coffee)	16%	19%	3%
Bottled Water	17%	20%	3%
Energy / Sports Drinks	23%	9%	-14%
Dilutes / Squash	10%	12%	2%
Smoothies	5%	6%	1%
Dairy Drinks (Milk	13%	14%	1%
None of these	0%	0%	0%

Further information was collected as to the breakdown of preference when it came to purchasing a soft drink. The options included 1. A full sugar drink, 2. Non-Sugar drink, and 3. No Preference. Initial observations suggest that preference to a non-sugar drink is significantly high. It is possible that the respondents have already shifted buying behaviour well before the sugar tax was implemented. This could be down to several factors, including product reformulation by manufacturers.

The scope of this research was limited in terms of time scale and longitudinal research; therefore, future research should concentrate on the investigation of the move to non-sugar soft drinks over the last number of years.



**Figure 14 - Preference of Soft Drinks: Full Sugar / Non-Sugar / No Preference**  
**Total number of respondents (N=117)**

Having identified the descriptive statistics of the respondents, what follows is the hypotheses findings and analysis.

## Hypotheses Findings

### First Objective

The first research objective was to identify if consumer behaviour has shifted since the introduction of the sugar tax on sugar sweetened soft drinks. The first hypothesis is:

- **H1** - Since the introduction of a tax on sugar sweetened soft drinks, Irish consumers have shifted their buying behaviour when buying sugar sweetened soft drinks.

The testing process for this utilised a logistic regression model set up through SPSS and used to predict a dichotomous (binary) variable from a set of predictor variables. It means there can be two possible outcomes. In this case, yes or no, has the introduction of the sugar tax shifted buying behaviour. This is a predictive model and is used to calculate the probability of the relationship between one dependent variable and other variables.

The tests revealed that, of the 117 respondents, there were 3 missing cases, therefore only 114 results can be used in the analysis.

Unweighted Cases <sup>a</sup>		N	Percent
Selected Cases	Included in Analysis	114	97.4
	Missing Cases	3	2.6
	Total	117	100.0
Unselected Cases		0	.0
Total		117	100.0

a. If weight is in effect, see classification table for the total number of cases.

**Figure 15 - Case Processing Summary - No. of Selected Cases - SPSS**

**Classification Table<sup>a,b</sup>**

	Observed	Predicted		Percentage Correct
		NO	YES	
Step 0	HAVEYOUCHANGEDBEHAVIOUR	No	0	100.0
		YES	8	.0
Overall Percentage				93.0

a. Constant is included in the model.

b. The cut value is .500

**Figure 16 – Classification Table - Have you changed your behaviour? – SPSS**

The classification table does not contain any predictive variables and is just an intercept only model. The overall percentage is the percent of cases for which the dependent variables were correctly given in the model. The results indicate that the null model is 93%, which indicates that 93% of respondents have not changed their buying behaviour since the introduction of the sugar tax on sugar sweetened soft drinks. The significance of the results below indicates that Irish consumers have not changed their buying behaviour since the introduction of the sugar tax.

To better understand the data, and its impact on behaviour, the researcher undertook a Bivariate Correlation test through SPSS, which involved taking some variables with dichotomous responses and comparing it with the question, have you changed your behaviour. The results in Table 10 indicate *p values (Sig) for values not used in the model*; these variables all have values of > 0.05, which means they are not significant individual predictors on a shift in behaviour.

### Variables not in the Equation

		Score	df	Sig.	
Step 0	Variables	PRICE	.001	1	.973
		NOTICINGPRICE	.011	1	.918
		PREFSUGARORNOSUGAR	2.518	1	.113
		SALARY	3.390	1	.066
		AGE	1.383	1	.240
		THINKABOUTSUGAR	1.034	1	.309
Overall Statistics		8.411	6	.209	

**Figure 17 - Bivariate Correlation Test - SPSS**

The model then continues to use these variables to understand if they are combined, have collectively had an impact on behaviour. Through the Chi-Square result, all the  $p$  values are  $> 0.05$ , which indicates that the model is not strong enough to state that these variables impact on consumer behaviour.

Further analysis using the results from the final test indicate odds ratios contained in the  $\text{Exp}(B)$  related to each of the variables. The test reveals that having a preference of sugar, non-sugar, or no preference is four times more likely to shift behaviour. Should the respondent notice a price increase, they are 1.3 times more likely to shift behaviour.

### Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1 <sup>a</sup>	PRICE	-.173	.843	.042	1	.837	.841	.161	4.386
	NOTICINGPRICE	.300	.985	.093	1	.761	1.349	.196	9.293
	PREFSUGARORNOSUGAR	1.412	.752	3.523	1	.061	4.104	.939	17.930
	SALARY	.462	.296	2.430	1	.119	1.587	.888	2.837
	AGE	-.379	.348	1.186	1	.276	.684	.346	1.355
	THINKABOUTSUGAR	-.994	.824	1.455	1	.228	.370	.074	1.862
	Constant	1.478	1.413	1.095	1	.295	4.386		

a. Variable(s) entered on step 1: PRICE, NOTICINGPRICE, PREFSUGARORNOSUGAR, SALARY, AGE, THINKABOUTSUGAR.

**Figure 18 - Bivariate Correlation Test – Variables - SPSS**

## Second Objective

The second objective sought to investigate the main factors that influenced the shift in consumer behaviour regarding the purchasing of soft drinks.

- **H2** – The shift in consumer behaviour regarding purchasing of soft drinks is down to a total number of factors.

Continuing to use a logistic regression model, which is used to predict a dichotomous variable from a set of predictor variables, the test incorporated several variables and tested these against the shift in behaviour to understand what factors had the most impact on behaviour change.

		Variables in the Equation					
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 <sup>a</sup>	PRICE	.135	.892	.023	1	.880	1.144
	NOTICINGPRICE	-.428	.971	.194	1	.659	.652
	THINKABOUTSUGAR	-1.325	1.125	1.386	1	.239	.266
	MOREAWAREOFSUGAR	-.922	.467	3.899	1	.048	.398
	LOOKATLABEL	-.454	.443	1.054	1	.305	.635
	Constant	-.241	1.247	.038	1	.846	.785

a. Variable(s) entered on step 1: PRICE, NOTICINGPRICE, THINKABOUTSUGAR, MOREAWAREOFSUGAR, LOOKATLABEL.

**Figure 19 - Logistic Regression Table - Factors - SPSS**

### Price:

Respondents were asked if they think about the price when buying a soft drink. The regression coefficient which is depicted by **B** in the above chart represents the relationship between a given explanatory variable and the outcome variable, which means the relationship between the price and shift in behaviour. The results from the test indicate that this had an exponential value **Exp (B)** of (1.144), which indicates that there is a unit change, and that looking at price is (1.114) times more likely to impact on behaviour when buying soft drinks. This variable had the most odds on shifting behaviour. From the test results, it is noted that there is little relationship between respondents thinking about price when buying a soft drink and a shift in behaviour. The standard error (**S.E.**) which is an

indication of the reliability of the mean comes in at (.135) in regard to thinking about price indicating

The degrees of freedom (**df**) for the Wald Chi-square test for price resulted in 1, as there is only one degree of freedom, as there is only one predictor in the model.

#### **Noticing Price:**

Respondents were asked if they have noticed the increase in the price of a sugar soft drink. The results indicate that this had an exponential value **Exp (B)** of .652, which indicates little or no change, therefore respondents not looking at price is having little or no effect on buying behaviour. There is no relationship between noticing the increase in price and a shift in behaviour. The degrees of freedom (**df**) for the Wald Chi-square test for price result of (1), as there is only one degree of freedom, as there is only one predictor in the model.

#### **Think about sugar:**

Respondents were asked if they think about the amount of sugar in a sugar soft drink. Results from the test indicate that this had an exponential value **Exp (B)** of .266, which also has little impact on buying behaviour. No relationship exists between respondents thinking about sugar and behaviour or noticing sugar content and a shift in buying behaviour. The degrees of freedom (**df**) for the Wald Chi-square test for price resulted is (1), as there is only one degree of freedom, as there is only one predictor in the model.

#### **More aware about sugar:**

Respondents were asked if they are more aware about sugar since in the introduction of the sugar tax. Results from the test indicate that this had an exponential value **Exp (B)** of .398, which also has little impact on buying behaviour. There is no relationship between being more aware of sugar and a shift in buying behaviour. The Wald statistical analysis tests whether the regression coefficient is an explanatory variable in a logistic regression that is different to zero. The result from this variable is 1.386, which indicates that being more aware of sugar content is not making any impact on predicting the outcome, and is not statistically significant, as values with a  $p < 0.05$  are only considered statistically significant. The degrees of freedom (**df**) for the Wald Chi-square test for price resulted is 1, as there is only one degree of freedom, as there is only one predictor in the model.

## Look at label:

Respondents were asked if they look at the sugar content on the label of a soft drink. Results from the test indicate that this had an exponential value **Exp (B)** of .398, which also has little impact on buying behaviour. There is no relationship between looking at the label and buying behaviour. The degrees of freedom (**df**) for the Wald Chi-square test for price resulted is 1, as there is only one degree of freedom, as there is only one predictor in the model.

In conclusion, to this logistic regression test, H2 hypothesis, that the shift in consumer behaviour regarding purchasing soft drinks is down to a total number of factors, is null, as none of the factor variables have had a significant impact on shifting behaviour.

Further research areas around this objective might look at colour coding of labels, as this area looks at variables including thinking about sugar, awareness of sugar, and looking at the label of soft drinks. Example below, on the left, indicates some products produced in Europe, with recommended daily guidelines (RDA), in contrast to the traffic light system of (RDA) that is used in the United Kingdom, which is a clear indicator of daily allowances. It is important to consider should this measure of information become implemented on products and have more influence on behaviour.



**Figure 20 - Food Labelling on packaging – Europe & United Kingdom**

**Source: (EuFoodPolicy, 2018)**

### Third Objective

The third objective explored the role of “price” when it comes to the buying process of soft drinks. This objective took account of a hypothesis to explain if price plays a significant role when it comes to purchasing a soft drink. The result from this test will indicate if the hypothesis is valid or can be rejected. The major limitation to this hypothesis is that, although it provides robust results to the hypothesis in question, it would fail to give indicators to areas that add to the existing knowledge or provide areas that require further research.

- **H3** - The price of a soft drink plays a significant role for Irish consumers when it comes to purchasing a soft drink.

The two questions asked were as follows,

1. do you think about price when buying a soft drink?
2. Since the introduction of a sugar tax on soft drinks, have you noticed the increase in the price of a sugar drink?

A Chi-square test was used to test the probability of independence of the data and test how likely the observed distribution is due to chance and test the null hypothesis that the variables are independent. Anything with a value of  $<0.05$  has a very low probability. The test results indicate that with a Pearson Chi-Square value of .011 indicates an extremely low probability.

### Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.011 <sup>a</sup>	1	.918		
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	.011	1	.918		
Fisher's Exact Test				1.000	.641
Linear-by-Linear Association	.010	1	.918		
N of Valid Cases	113				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 2.12.

b. Computed only for a 2x2 table

**Figure 21 - Chi Square Test - SPSS**

Further analysis including using a sample t-test, which allowed the researcher to test if the sample mean of males and females, and if there is a difference to the hypothesised mean, the group statistics indicate that there are very slight differences between male and females when it comes to noticing a price increase; .67 for Males and .59 for females. When noticing price, Males have a mean of .70 versus Females, at .76.

### Group Statistics

	GENDER	N	Mean	Std. Deviation	Std. Error Mean
PRICE	MALE	43	.67	.474	.072
	FEMALE	71	.59	.495	.059
NOTICINGPRICE	MALE	43	.70	.465	.071
	FEMALE	70	.76	.432	.052

**Figure 22 - T-Test - Group Statistics of Price**

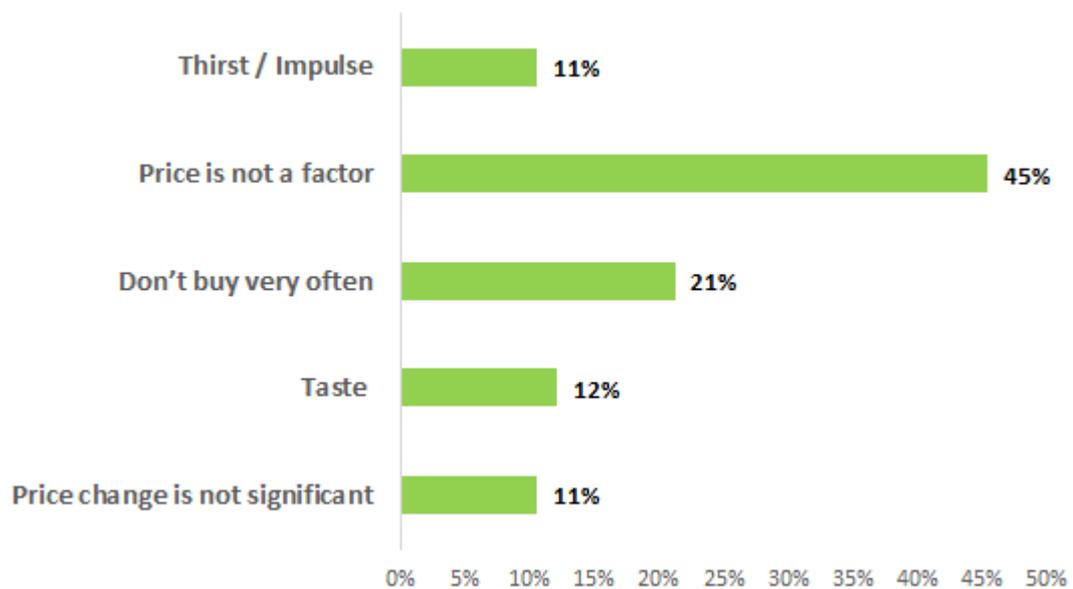
To develop this further in relation to thinking about price increase and noticing the price increase, both male and female respondents had  $p$  levels over the significance level of  $>0.05$ , therefore, the hypothesis can be rejected.

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means			95% Confidence Interval of the Difference			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
PRICE	Equal variances assumed	3.381	.069	.880	112	.381	.083	.094	-.104	.269
	Equal variances not assumed			.889	91.766	.376	.083	.093	-.102	.268
NOTICINGPRICE	Equal variances assumed	1.794	.183	-.690	111	.491	-.059	.086	-.230	.111
	Equal variances not assumed			-.678	84.003	.499	-.059	.088	-.234	.115

**Figure 23 - Independent Samples Test - Price**

As explained earlier, this objective also had an open question element to gain more insight around the 'role' of price. However, with a small sample size, caution must be applied, as the findings might not be transferable to be representative of the large population.



**Figure 24 - Why do you not think about price?**

**Total number of respondents (N=66)**

Respondents were asked why they did not think about price when buying a soft drink. This open-ended question did not have a forced response attached to it. Of the 117 respondents, 66 responded with their thoughts. Five broad themes emerged from the analysis. The main theme that came through was that price is not a factor, with a 45% share of respondents having this view.

The next theme that arose was that they didn't buy soft drinks very often, and this came in at 21%; this result must be interpreted with caution because this does not state whether they took into consideration the price. It could be argued that, as these respondents did not buy soft drinks very often, they may be unable to anchor the price of the product. Adaval and Wyer (2011) further discuss this theory explaining that the price that is selected as an anchor is theoretically the price that is most accessible in memory at the time of judgment. Should these respondents not purchase soft drinks very often, they may be

unable to anchor a price and therefore a higher price of a taxed soft drink may seem the normal price to pay. One implication from this finding is that it refers to people being unfairly taxed when it comes to buying soft drinks and these respondents could be classified as low users of soft drinks.

Taste emerged from the findings with an 11% share, respondents replied that they bought 'depending on taste buds' and simply that they like the 'taste of the product'. The evidence from this result could suggest the link to the addictive nature of soft drinks. Studies have indicated that tasting something sweet leads to the activation of pleasure-generating brain circuitry. In addition, according to clinical studies, this circuitry is the same or overlaps with parts of the brain that mediates the addictive nature of drugs such as alcohol and opiates (Drewnowski, Mennella, Johnson and Bellisle, 2012). The researcher recommends that further research should be conducted in this area. Although there was an option in the questionnaire related to whether the respondent was 'slightly addicted to sugar soft drinks'. Of the 117 respondents, nobody said they were addicted.

Similarly, in the same vein, the themes of impulse and thirst were combined to give an 11% share of the responses, since it can be viewed that thirst is aligned with an impulse purchase.

The final theme that came through was that price change was not significant enough for the respondents to think of price. Much of the literature states that an increase in price can have an impact on soft drink purchases (Gustavesn and Rickersten, 2011; Colchero *et al.*, 2016), but the result of this study contradicts this literature. Although in contrast, the findings of this study support research conducted by Falbe *et al.* (2015) that small price increases may not have an impact on behaviour, this study's findings provide information that the price increase on sugar sweetened soft drinks may not be high enough to deter purchase by consumers.

The findings in this question are subject to at least three limitations. The main limitation relates to investigating actual sales figures from the Irish retail market, using information from Nielsen scan track, which would provide specific sales data on each brand, pack, size and spend, and which would indicate how much was spent by Irish consumers. The result of this could agree with the respondents that they don't think about price, when in fact there has been a shift to more affordable non-taxed soft drinks. An example could be a full

sugar 7up consumer who might shift to a lower priced 7up free, which is non-taxed and cheaper, but not have a perception that they shifted behaviour. It is important to consider if soft drinks are bought as a single purchase with a few items or part of the weekly grocery shopping. If they are purchased in the latter, the individual price might be disguised within the other items; this could be a possible explanation for these results.

It is recommended that further research determine if the price increase set by the Irish government is high enough to shift behaviour. With the findings of the study indicating that over 50% of the respondents had a salary higher than the average salary, it can be suggested that the salary range of the respondents, may have an impact on the purchasing behaviour of consumers.

The researcher would have liked to apply a forced response to this question to gather more responses but adding these to questions can add to frustration for the respondent.

The following conclusions can be drawn from this objective that explores the role of price when buying soft drinks. Irish consumers do not think about price when purchasing a soft drink, which contrasts with the aim of the tax. Finally, Irish consumers are not noticing the price increase when purchasing a soft drink.

#### **Fourth Objective**

The fourth objective sought to determine if Irish consumers take into consideration their consumption of sugar when purchasing soft drinks. This objective took account of a hypothesis to explain if sugar and sugar content plays a significant role when it comes to purchasing a soft drink. The result from this test will indicate if the hypothesis is valid or if it can be rejected.

- **H4** - The sugar content of soft drink has an influence on the decision-making process of the Irish consumer.

For this analysis, the researcher undertook another logistic regression through SPSS, used to predict a dichotomous (binary) variable from a set of predictor variables. It means there can be two possible outcomes. In this case, yes or no, sugar content of a soft drink had an

influence on the decision-making process. This is a predictive model and is used to calculate the probability of the relationship between one dependent variable and other variables. Included in the variables tested against a shift in behaviour are the following:

1. When buying soft drinks, do you think about the amount of sugar in the drink?
2. Since the introduction of a sugar tax on sugar soft drinks, are you now MORE aware of sugar in a soft drink than before the introduction of the sugar tax?
3. Do you look at the sugar content on the label of a soft drink?

Variables not in the Equation			Score	df	Sig.
Step 0	Variables	THINKABOUTSUGAR	.305	1	.581
		LOOKATLABEL	1.247	1	.264
		MOREAWAREOFSUGAR	4.591	1	.032
Overall Statistics			6.793	3	.079

**Figure 25 - Binary Regression Model - Sugar – SPSS**

This test revealed that thinking about sugar content and looking at the label of a soft drink have *p values of* > (0.05), which indicate that they do not have an influence on behaviour when buying a soft drink. The only variable that had an impact was the increased or more awareness of sugar, which reported a *p value of* (.032), which is < (0.05), which indicates that being more aware of sugar content has a minor influence on behaviour. Taken together the main sugar questions, the overall statistics indicate that the *p value* (.079) is higher than 0.05, therefore the hypothesis is null and can be rejected. Sugar does not have an influence on the decision-making process of Irish consumers.

### **Fifth Objective**

The final objective was to determine if perceptions of total sugar content of beverages is accurate, and if it can be determined if Irish consumers are aware of sugar intake when buying beverages.

- **H5** – Irish consumers’ perceptions of sugar content in beverages are accurate enough to make an informed decision of sugar intake.

This objective was framed differently in the questionnaire, the respondent was asked to guess on a scale from 0 – 12 the number of spoons of sugar from a range of beverages. Each beverage had an image and description of the beverage, and the guess was for 200ml / small glass of each, as per Figure 26.



**Figure 26 - Sugar content with beverages**

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All data collected was then graded as per the below grading system to group responses and accuracy levels. Example of grading: Glass of Milk contains 3 spoons of sugar. If respondent answered 3, they were allocated 5 points, if they answered 2 spoons, allocated 2 points, 1 spoon was allocated 1 point, and an incorrect answer or out by 3 spoons or more equalled no points.

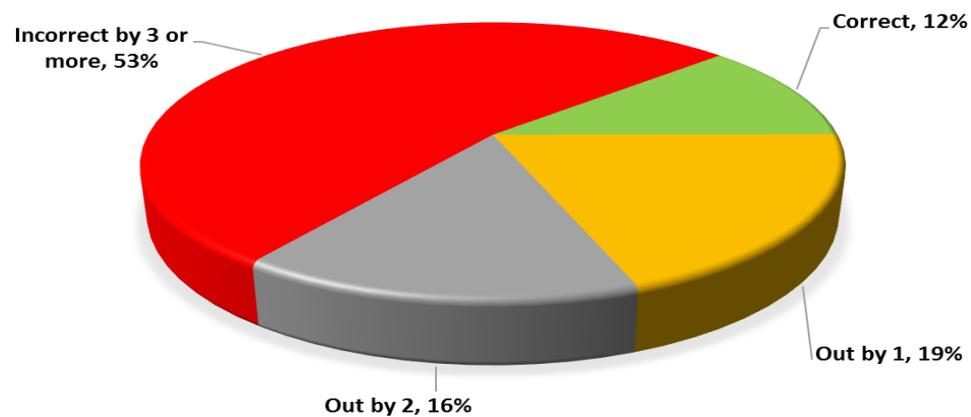
Grading	Points
Correct Amount of sugar in drink	5 points
Out by 1 spoonful either way in drink	2 points
Out by 2 or more spoonfuls either way	1 point
Incorrect or out by 3 or more spoonfuls either way	0 points

**Figure 27 - Sugar Grading Chart**

Grade	Pepsi Max	Milk	Coca Cola	Ocean Cranberry Juice	Naked Smoothie	Jaffa Orange Juice	Costa Latte Massimo
Correct	28%	10%	7%	9%	10%	11%	6%
Out by 1	3%	32%	14%	31%	27%	29%	1%
Out by 2	2%	31%	13%	24%	19%	16%	5%
Incorrect by 3 or more	68%	28%	66%	36%	44%	44%	87%
Total	100%	100%	100%	100%	100%	100%	100%

**Figure 28 - Breakdown of total sugar perception**

**Total number of respondents (N=111)**



**Figure 29 - Accuracy levels by respondents**

**Total number of respondents (N=111)**

Despite its exploratory nature, this research offers significant insights into perceptions of sugar content when it comes to beverages. If the debate on sugar is to be moved forward, introducing the tax to other sugar food and drink categories, the Irish government should investigate consumers perceptions deciding to purchase a product for consumption. Should Irish consumers perceptions be accurate, it can be argued that consumers are making an informed choice when it comes to sugar intake. Should the findings reveal otherwise, it can be argued that Irish consumers may move to a substitute, non-taxed product that can contain more sugar, therefore eliminating the benefits of the tax altogether

The findings indicate clearly that the perceptions of sugar content contrasts significantly with the actual sugar content. Interestingly, Pepsi Max, which contains no sugar, reported the most correct answers at 28%. An important limitation to this figure is that Pepsi Max's recent advertising campaigns and labelling contain the 'No Sugar' messaging, as indicated in Figure 17.



**Figure 30 - Pepsi Max Advertisement**

**Source: Youtube.com (2018)**

### **Conclusion of Analysis**

This chapter set out to give an overview of the main findings of the research project and the give a clear analysis of the findings. Returning to the question posed at the beginning of this research project, it is now possible to state that the introduction of the sugar tax on soft drinks did not have an impact on Irish consumer buying behaviour.

The next chapter discuss the analysis further, with recommendations from the research, with regards to how the research and findings relate to the literature reviewed.

## Conclusions and Recommendations

The following chapter provides a review of the findings in relation to the research question *'Will the introduction of a sugar tax on soft drinks have an impact on Irish consumer buying behaviour?'* along with the sub objectives. From this, conclusions will be compiled, and recommendations will be made.

The obesity epidemic is very well documented, with healthcare services struggling under the burden of obesity related illnesses. A clear example of how obesity affects the health service is in the United Kingdom, where the National Health Service spent £1.3 million on "supersize" ambulances to carry obese people, as the number of obese people requiring rose from 52,000 in 2006 to 520,000 patients in 2016 (Telegraph, 2017). Unfortunately, this trend shows no sign of slowing down.

This issue has serious implications for Governments, society and individuals worldwide, which is the reason why governments are introducing a wide range of measures to slow down this epidemic. One of the areas include a tax on sugar sweetened soft drinks, as some research indicates that this is a major contributor to the obesity crisis. Although this tax has been introduced in many countries worldwide, it was only introduced in Ireland in May 2018. Would this tax shift Irish consumers buying behaviour? Is a price increase enough to stop people buying sugar drinks? Do Irish consumers consider sugar when purchasing soft drinks? And finally, do Irish consumers have an accurate perception of sugar content regarding a wide range of beverages?

A quantitative method was used for this research project and involved open and closed questions through an online questionnaire. It questioned Irish consumers aged 18 – 65+ on a range of areas related to soft drinks, buying behaviour, and what influence sugar and price has on decision making. The data was collected from respondents using a snowball technique and resulted in 117 responses, which provided robust and reliable data to use for analysis.

In keeping with the main research question and the sub-objectives, the research concludes that Irish consumer behaviour has not shifted since the introduction of the sugar tax on sugar sweetened soft drinks, and no variables, including price and sugar content, have been identified as impacting buying behaviour. Thus, Irish consumers have a significant inaccurate perception of sugar content in beverages.

### **The research highlights:**

1. Irish consumers aged 18 – 65+ have not changed their buying behaviour when it comes to buying soft drinks.
2. The findings of the current study does not support much of the literature regarding the introduction of a sugar tax on sugar sweetened soft drinks, where it has been indicated that an increase in price impacts behaviour.
3. Price does not have an impact on Irish consumers when buying soft drinks.
4. Sugar does not influence buyer behaviour with regards to soft drinks.  
The importance of considering consumer perceptions of sugar content of food and drink products.
5. Important factors for governments to consider when implementing measures to improve health, including improved labelling on products, taxes impacting on unintended people.
6. Gaps in research regarding introducing taxes to shift behaviour (which this thesis attempts to fill).

## **Discussion**

This section will review each objective, draw conclusions from the results and link back to current literature.

### **Shift in consumer behaviour**

Research objective 1 looked to identify if consumer behaviour had shifted since the introduction of the sugar tax on sugar sweetened soft drinks. Literature in this area has

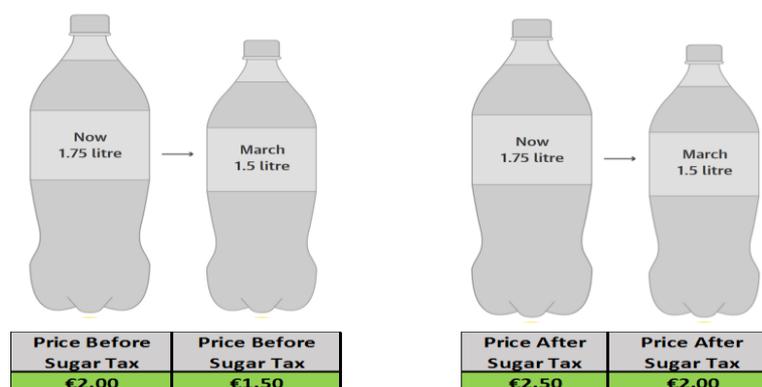
identified that introducing such taxes, results in price increases and effectively shifts consumer behaviour into alternative beverages. The findings were unexpected, and the results indicate that 93% of respondents did not change their behaviour. These findings contrast significantly with research in this area (Colchero, 2017; Falbe, 2015, Gustavsen, 2011).

To discuss the unexpected findings, the following will review the research methods for this objective. The number of respondents used for the study was classified as valid for an online questionnaire according to Saunders *et al.* (2012), although the researcher is of the view that this should be larger to gather a more national representation.

The age cohort of respondents ranged from 18-65+, however the 18-24 age group was small, this group should this have had more participants, this may have had an impact on the results. Also, as highlighted earlier, younger teens aged between 13-17 should have been used for research, as these disproportionately consume more SSBs than adults (Scully, Morely, Niven and Crawford, 2017; Couch, 2011). However, due to limited access to this age group, this group was not included in the research. A future study of this age group alone would be interesting.

Nakhimovsky (2017) concluded that if the primary goal of the tax is to reduce consumption, then the increase in price needs to be 20% or more. The sugar tax in Ireland was set at different levels, calculated at the percentage of sugar per 100mls, which may not shift a price point by 20%.

Another factor that may have had an impact on the results is that some manufactures including Coca-Cola reduced their pack sizes ahead of the introduction of the sugar tax, resulting in consumers buying a smaller pack with the tax added would in fact be closer to the 'framed' price of soft drinks (The Guardian, 2018).



**Figure 31 - Coke Pack Size Changes**

**Source. The Guardian (2018)**

There has been no research, to date, regarding different pack sizes affecting behaviour, thus further research needs to examine the links between pack size changes and behaviour change more closely.

Research objective 2 investigated the main factors that influenced the shift in consumer behaviour. The results revealed that the factors highlighted from the research did not have an impact on shifting behaviour. This objective came about through researching the literature and found the factors that influencing the consumer to shift from buying sugar soft drinks. Price was the main factor, as the literature states that a price increase on soft drinks leads to a shift in buying behaviour (Nakhimovsky, 2016; Colchero, 2016; Falbe, 2015, Finkelstein, 2011). This factor did not have an impact on behaviour, which contrasts with the literature. As explained earlier, the pack size change may have had an impact on larger pack formats, which possibly is a factor on the impact of price.

In relation to price and sugar, Research objectives 3 and 4 are included in this section, as these were factored into the objective, whereby respondents were asked did they notice the price, which also had no effect on behaviour. Johnson, Herrman and Bauer (1999) in their empirical results revealed that, when purchasing items in a bundle, mental accounting affects the decision. A possible explanation to consumers not being aware of price may be affected by the offers that are available in stores, such as a 2 for €x offer, or as part of a meal deal offering. When compiled with the factors, including thinking about sugar, awareness of sugar, and looking at the label, all these factors did not have an influence on shifting behaviour.

This study contrasted with the research shows that consumers are shift behaviour from SSD's into ASBs to reduce sugar intake (Borges, 2017, Finkelstein, 2016). A possible reason is the manufacturers' response to sugar tax by reformulating sugar drinks to either a non-sugar format or to a drink that would be under the grams per 100ml, to minimise the increase in price (Borges, 2017; Cobiac, 2017; Gornell, 2015). More research is needed to better understand Irish consumers shift into ASBs over the last 10 years since manufactures started to reformulate beverages.

The final objective was to determine if the perceptions of the total sugar content of beverages are accurate, to see if it can be determined that Irish consumers are aware of sugar intake when buying beverages. The reason for undertaking this different approach was due to the gap in the research and the researcher's interest in consumer behaviour. The major finding in this objective is that Irish consumers are significantly incorrect regarding sugar content in beverages. Nearly three quarters (68%) of perceptions of sugar content were incorrect, and only 28% of answers were correct. It is almost certain that Irish consumers purchase beverages with an incorrect presumed sugar content. This has major implications for substitutions in relation to the sugar tax. The sugar tax was introduced to shift consumers from SSD's into more healthier beverages, but if consumers do shift behaviour to a beverage that is not an ASB, they could be consuming more sugar from a non-taxed product content, thus, it is possible that the sugar tax is failing in its purpose. Detailed examination of substitutions by Hendrikesn *et al.* (2011) found that substituting to ASBs has beneficial effects on BMI and a reduction in health issues. There is a lack of research into substitution to other beverages. Further investigation and experimentation into perceptions of sugar content should be undertaken, as this may lead to a broadening of the sugar tax, or the introduction of traffic light labelling as mentioned earlier. This may help Irish consumers make a more informed decision as to their consumption of sugar.

### **Implications and recommendations for Governments**

The Government should consider that the tax is a regressive sin tax, with evidence provided to show that consumers are not making an informed decision about sugar content, thus the tax may in fact be inappropriate. When introducing a new tax to improve health, more information should be disseminated to consumers, as this might shift behaviour before the

tax is implemented. Should the Government decide to effectively challenge the obesity epidemic in Ireland, there are other areas to consider. There is sugar in cookies, ice cream, chocolate, sweetened iced tea, jams, jellies, and breakfast cereals and also in peanut butter, salad dressing, ketchup, barbecue sauces, canned soups, processed meats bacon, hot dogs, crisps, roasted peanuts, pasta sauces, tinned tomatoes and bread. These areas are not impacted by a sugar tax. The last item, 'Bread', has a high amount of sugar and is purchased by over 70% of Irish consumers each week (Bordbia, 2014). It is possible that bread has a higher calorific intake than soft drinks, which is only at 3%, therefore, it can be concluded that the taxation on sugar sweetened tax is a regressive tax on Irish consumers.

## **Successes and Limitations**

### **Successes**

- (a)** Meeting all the research objectives and sub objectives.
- (b)** Establishing that 'price' is not a significant factor when buying soft drinks.
- (c)** Establishing that 'sugar content' of soft drinks does not affect buying behaviour.
- (d)** Has provided evidence that Irish consumers' perceptions on sugar content of beverages is extremely inaccurate.
- (e)** The research and findings has set out interesting questions for policy makers to consider when introducing regressive taxes or health measures to shift behaviour
- (f)** Has provided reliable and robust evidence on Irish consumer behaviour for the food and drink industry.

### **Limitations**

There were some limitations to the study that have been highlighted previously,

- (a)** The sample size was small. The 117 completed surveys did ensure robust and reliable data, but a larger sample size would be more nationally representative.
- (b)** Limited respondents in the 18 to 24 age group. This cohort consume a significant amount of soft drinks, thus, a study of this age group alone requires additional research.
- (c)** A more longitudinal study, gathered with scan track data from the leading supermarkets, could have enriched the findings further.

**(d)** Qualtrics software provided an excellent easy to manage online questionnaire platform, which allowed for easy access and completion by respondents. An issue occurred when gathering the data, as the account was a trial account, this meant the data could not be extracted to be analysed in SPSS. Only for the National College of Ireland having a subscription, the researcher would have been required to collect data again.

### **Recommendations for further study**

As a result of this study, there are a wide number of areas that can be further explored in order to increase the knowledge and theory related to consumer behaviour, price, implementation of taxes on sugar soft drinks, consumers' perceptions of sugar in beverages, and substitute products. It is also suggested that the area of substitution of beverages be considered for future study, as this impacts on how consumers behave if they are to shift to an alternative beverage, as they could shift to a perceived healthier drink and consume more calories than expected. It was not expected to get findings to indicate that Irish consumers had not shifted their buying behaviour regarding soft drinks. Therefore, further research should be carried out. The most important limitation lies in the fact that the study did not include 13 to 17-year olds in the study, and that the next age group of 25 to 34 only gathered a small number of respondents, which must be considered, as both age cohorts disproportionately consume more sugar sweetened beverages than other age groups. Therefore, further research is needed to account for these age groups and consumption behaviour. The current investigation was limited by time, thus it is recommended that further research be undertaken to include longitudinal and a scan track study of soft drinks to understand behaviour over a longer period, on a national scale, and with the scan track data from the market supporting the findings.

## **Conclusion**

In conclusion, a study into the introduction of a tax on sugar sweetened soft drinks is extensive, diverse, and extremely interesting when all variables are considered. The research has found that, since the introduction of a tax on sugar sweetened soft drinks, there has been no shift in behaviour for Irish consumers. Price and sugar content, among the many variables tested in the research did not have an impact on behaviour. A limitation to this study is that the tax is still relatively new, having only being introduced in May 2018. Therefore, it has been highlighted that a broader research project should be undertaken.

The findings from this study make several contributions to the current literature. Firstly, that Irish consumers are not affected by the tax on sugar sweetened soft drinks, secondly, that many factors such as and including price and sugar content do not have an influence on buying behaviour. Finally, Irish consumers are unable to make informed decisions based on their perceptions of sugar content when it comes to buying beverages. These findings are extremely important for governments and policy makers, as introductions of taxes to impact on behaviour need to be fully understood to be effective in their purpose. For the food and drink industry, these findings may assist as governments battle to overcome the obesity crisis with new product developments.

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# Appendices

## Appendix 1 - Online Questionnaire – Word

### Introduction of Sugar Tax

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Start of Block: Introduction Questions

Thank you in advance for taking the time to complete this survey. The purpose of this survey is to understand consumer behaviour since the introduction of a sugar tax on soft drinks in Ireland. This survey will take 6-8 minutes and is strictly confidential. Notes: The term 'soft drink' relates to carbonated (Fizzy Drinks) example (Coca-Cola). The term 'full sugar soft drink', refers to a soft drink with added sugars. The term 'buying' refers to when buying drinks in an Irish shop / supermarket (including coffee shops) and includes all pack sizes, cans and bottles.

-----

Q1 Are you Male or Female?

- Male (1)
  - Female (2)
- 

Q2 What is your age?

- 18-24 (1)
  - 25-34 (2)
  - 35-44 (3)
  - 45-54 (4)
  - 55-64 (5)
  - 65 or above (6)
- 

Q 3 What is your current salary?

- Less than €15,000 (1)
- €15,001 – €24,999 (2)
- €25,000 – €34,999 (3)
- €35,000 – €44,999 (4)
- Over €45,000 (5)

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End of Block: Introduction Questions

Start of Block: The next section will look at your buying pattern of drinks in the last 6 months

**The next section will look at your buying pattern of drinks in the last 6 months.**

**Q 4 Which, if any, of the following drinks have you PURCHASED in the last 6 months?  
MARK ALL THAT APPLY.**

- Soft Drinks (1)
  - Hot Drinks (Tea, Coffee) (2)
  - Bottled Water (3)
  - Energy / Sports Drinks (4)
  - Dilutes / Squash (5)
  - Smoothie (6)
  - Dairy Drinks (Milk) (7)
  - None of these (8)
-

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**Q 5 Which, if any, of the following drinks have you CONSUMED in the last 6 months?  
MARK ALL THAT APPLY.**

- Soft Drinks (1)
  - Hot Drinks (Tea, Coffee) (2)
  - Bottled Water (3)
  - Energy / Sports Drinks (4)
  - Dilutes / Squash (5)
  - Smoothies (6)
  - Dairy Drinks (Milk) (7)
  - None of these (8)
- 

**Q 6 When you are buying a soft drink, is your preference for a full sugar or non-sugar soft drink?**

- Full Sugar (1)
- Non-Sugar (2)
- No Preference (3)

End of Block: The next section will look at your buying pattern of drinks in the last 6 months

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Start of Block: The next section will look at the introduction of sugar tax on soft drinks.

**The next section will look at the introduction of sugar tax on soft drinks in Ireland**

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Q 7 Are you aware that a sugar tax was placed on sugar sweetened soft drinks?

Yes (1)

No (2)

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Display This Question:

*If Are you aware that a sugar tax was placed on sugar sweetened soft drinks? = Yes*

Q8 Please state how you were made aware of the sugar tax. MARK ALL THAT APPLY.

TV (1)

National Newspaper (2)

Magazine (3)

Internet (4)

Social Media (5)

Radio (6)

At the point of purchase (7)

From a friend / Colleague / Family (8)

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**Q 9** As you were NOT aware of a sugar tax on soft drinks, do you think you will **still continue** to buy sugar taxed soft drinks?

Yes (1)

No (2)

---

Display This Question:

*If As you were NOT aware of a sugar tax on soft drinks, do you think you will still continue to buy... = Yes*

**Q 10** Please give a reason why you will **still continue** to buy sugar taxed drinks.

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Display This Question:

*If As you were NOT aware of a sugar tax on soft drinks, do you think you will still continue to buy... = No*

**Q 11** Please give a reason why you will **NOT** continue to buy sugar taxed soft drinks.

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**Q 12** Do you feel there was sufficient information provided by Government in relation to the introduction of the sugar tax?

Yes (1)

No (2)

End of Block: The next section will look at the introduction of sugar tax on soft drinks.

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Start of Block: Purchasing behaviour of soft drinks in the last 6 months

**Q 13** The next section will look at your buying behaviour of soft drinks in the last 6 months.

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Q 14 Have you changed the amount of sugar soft drinks you have bought since the introduction of the sugar tax?

Yes (1)

No (2)

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*Display This Question:*

*If Have you changed the amount of sugar soft ~~drinks~~ you have bought since the introduction of the sugar tax. = Yes*

Q 15 Why have you changed the amount of sugar soft drinks you have bought?

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*Display This Question:*

*If Have you changed the amount of sugar soft ~~drinks~~ you have bought since the introduction of the sugar tax... = No*

Q 16 Why have you NOT changed the amount of sugar soft drinks you have bought?

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Q 17 Since the introduction of the sugar tax, how much full sugar soft drinks have you bought?

- Less (1)
- Same (2)
- More (3)
- I don't buy full sugar drinks (4)

---

*Display This Question:*

*If Since the introduction of the sugar tax, how much full sugar soft drinks have you bought? = Less*

Q 18 Please select the reasons why you are buying LESS sugar soft drinks. MARK ALL THAT APPLY.

- Too much sugar in soft drinks (1)
- New price is too high (2)
- I now drink diet soft drinks (3)
- I have moved away from consuming sugar soft drinks (4)
- I now consume something else (Water / Squash / Tea) (5)
- Media attention around sugar tax (6)
- Risk of impact on my overall health (7)
- Other (10)

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*Display This Question:*

*If Since the introduction of the sugar tax, how much full sugar soft drinks have you bought? = Same  
And Since the introduction of the sugar tax, how much full sugar soft drinks have you bought? = More*

**Q 19** If you are still buying the **SAME OR MORE** sugar soft drinks since the introduction of the sugar tax, please select the reasons why. **MARK ALL THAT APPLY.**

- Sugar content is not a concern to me (1)
- I crave a sugar soft drink (2)
- The increase in price is not high enough to make me buy less (3)
- I feel I drink sugar soft drinks in moderation (4)
- I have reduced my sugar in my diet in other ways (5)
- I feel I may be slightly addicted to sugar soft drinks (8)
- I enjoy the energy / rush from a sugar soft drink (7)
- I feel I sometimes deserve a sugar soft drink (8)
- None of these (10)

End of Block: Purchasing behaviour of soft drinks in the last 6 months

---

Start of Block: The next section will look at the price of soft drinks.

*Display This Question:*

*If Since the introduction of the sugar tax, how much full sugar soft drinks have you bought? = I don't buy full sugar drinks*

**The next section will look at the price of all soft drinks.**

-----

**Q20** Do you think about the price when buying a soft drink?

- Yes (1)
  - No (2)
-

Display This Question:

*If Do you think about the price when buying a soft drink? = No*

Q21 Why do you not think about price?

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Q22 Since the introduction of a sugar tax on soft drinks, have you noticed the increase in the price of a sugar soft drink?

Yes (1)

No (2)

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Display This Question:

*If Since the introduction of a sugar tax on soft drinks, have you noticed the increase in the price... = Yes*

Q23 Do you now make a conscious decision to buy a non-sugar taxed drink due to the price increase?

Yes (1)

No (2)

End of Block: The next section will look at the price of soft drinks.

---

Start of Block: The next section will look at sugar content in drinks.

Q24 When buying any soft drink, do you think about the amount of sugar in the drink?

Yes (1)

No (2)

-----

Display This Question:

*If When buying any soft drink, do you think about the amount of sugar in the drink? = Yes*

Q25 Why does the the level of sugar content effect your decision?

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Q26 Since the introduction of a sugar tax on sugar soft drinks, are you now MORE aware of the amount of sugar in a soft drink than before the introduction of the sugar tax?

Yes (1)

No (2)

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Q27 Do you look at the sugar content on the label of a soft drink?

Yes (1)

No (2)

Sometimes (3)

Q28 Based on a half glass of each of the 7 drinks below, rate how many spoonful's of sugar you think are in each drink.

		Number of Spoons of Sugar										
		0	1	2	3	4	5	6	7	8	9	10 or more
Pepsi Max		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coca-Cola		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ocean Spray Cranberry Juice		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Naked Tropical Smoothie		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Orange Juice		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Costa Latte		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

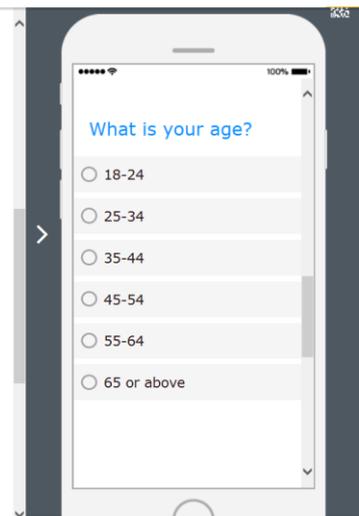
## Appendix 2 - Online Questionnaire - Qualtrics

What is your age?

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 or above

What is your current salary?

- Less than €15,000
- €15,001 - €24,999



National College of Ireland  
Research Students Declaration Form  
(Thesis/Author Declaration Form)

**Name: Simon O'Connor**

**Student Number: 16121732**

**Degree for which thesis is submitted: MSc in Management**

**Material submitted for award**

- (a) I declare that the work has been composed by myself.
- (b) I declare that all verbatim extracts contained in the thesis have been distinguished by quotation marks and the sources of information specifically acknowledged.
- (c) My thesis will be included in electronic format in the College Institutional Repository TRAP (thesis reports and projects)
- (d) ***Either*** \*I declare that no material contained in the thesis has been used in any other submission for an academic award.

***Or*** \*I declare that the following material contained in the thesis formed part of a submission for the award of

Master of Science in Management

**Signature of research student:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Submission of Thesis to Norma Smurfit Library, National College of Ireland**

Student name: \_\_\_\_\_

Student number: \_\_\_\_\_

School: \_\_\_\_\_

Course: \_\_\_\_\_

Degree to be awarded: MSc. in Management

Title of Thesis: 'An Investigation into the introduction of a tax on sugar sweetened soft drinks in Ireland and its impact on consumers buying behaviour.'

