



An analysis of how persuasive communication cues can influence behavioural change to reduce food waste across the retail supply chain ecosystem

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Qualification: Postgraduate Diploma in Brand Contact Management

Module Name: Research Methodology

Module Code: RMET8419p

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Word count: 8893

August 2020

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Abstract

Food waste has been agreed by various literature that it is a global issue that needs to be solved. However, there has not been a universal agreement of how food waste can be defined. According to Nahman and Lange (2012) definitions of food waste differ widely – as such for the purpose of this research we will be using their definition as it seeks to address a multitude of food wastage that occurs in the supply chain and opens it up to include other stakeholders. We undertook research to understand whether a multidisciplinary approach is ideal and to ensure that communication is a driver to effect behavioural change. Thus, we define food waste broadly to include losses that arise before food reaches the end-user (pre-consumer food losses), as well as food that is discarded by consumers (post-consumer food waste) Nahman and Lange (2012). The purpose of using this definition is to set context to the post-consumer wastage that occurs. This is wastage that occurs in households due to over buying and cooking, and the incorrect understanding of food packaging and general consumer perceptions to food waste.

1. Introduction

1.1 Rational

Having chosen the critical realist worldview, we see the phenomenon as an issue that needs information to help people make better decisions which will ultimately change their behaviour for the greater good of the environment.

Food waste being such a prevalent global crisis, there are two theories that stand out for the purposes of this study, namely, theory of planned behaviour Brown, Ham and Hughes, (2010) and persuasive communication theory Ajzen, (1992). The reason for this that they form a strong basis to the research problem identified as well as the questions. Referring to the research topic, there has been a fair amount of research that has been done – however, it does not link directly to food waste. It links to the related phenomenon that may have similar impacts on the environment and health. In a study looking at A cross-cultural study of the persuasive effect of fear appeal messages in cigarette advertising: China and Canada It investigates the difference in persuasibility of fear appeal messages against smoking on two cultural groups differing on collectivism, namely Anglo-Canadians and PRC Chinese Laroche, Toffoli, Zhang and Pons, (2001). Parallels will be drawn during this study, based on similar literature.

1.2 Problem Statement

Having reviewed literature and other sources, we know that global food waste is a crisis, Nahman and Langa (2013) state that on a per capita basis, overall food waste throughout the supply chain is far higher in developed countries than in developing countries. However, this does not absolve developing nations from the problem. We have identified that there is a limited number of studies that consider the effects post-consumer food waste in the broader supply chain ecosystem.

Most of the studies look at food waste within the pre-consumer activity in the supply-chain ecosystem. How could these be possibly addressed? We found research that informs us that food waste is not a phenomenon that should be viewed from one stakeholder perspective, but it needs to be a multidisciplinary approach. Alamar, Falagán, Aktas, and Terry, (2018) agree that to tackle this global problem a multidisciplinary and collaborative research paradigm shift is required bringing together engineering and behavioural economics research that

provides robust data regarding horticultural produce losses. Further to this it also brings about how policies, broader stakeholder awareness and education is managed in context to food waste management.

The aspect of better awareness and education strategies to reduce food waste comes to light. In the earlier parts of the paper we had eluded that there needs to be a broader consideration of using all players in supply chain ecosystem, society, and government to communicate the benefits of reducing food waste. In a study done by Ramukhwatho et al., (2014) suggest that from a South African perspective when evaluating the cause of why households waste so much food, these were the reasons stated by respondents, preparing too much food, expiry date was sooner, and promotional marketing from retailers. Therefore, this has led us to identify that the problem starts from a lack of awareness and understanding as to what are the effects of food waste to the broader society and what strategies can be communicated in a ethical way to effect behavioural change.

Having stated the above, it is, thus important to consider the role of communication in effecting behavioural change through, awareness and education of how food waste can be reduced.

Should the issues of food waste continue there would be several societal downfalls that would be experienced. For instance, the issue of food security comes to the fore as the lack of awareness and education from a consumer perspective could potential increase this. (Nahman et al., 2012; Oelofse and Nahman, 2013) emphasize that a substantial proportion of discarded food is still edible, implying that it could have been used to feed those in need, if it had been better managed or distributed. In addition to inedible food waste this means that food that could have been used in compost and energy generation would be lost; (Nahman et al., 2012; Oelofse and Nahman, 2013) also further confirm that the decomposition of organic waste at landfill or by incineration leads to a range of environmental and social impacts.

Being able to solve this problem will then give rise to how communication can be used as an effective tool to influence behavioural change to issues relating to public health i.e. consumption of sugar, practices that destroy the environment i.e. littering, food waste etc.

Having mentioned the above potential issues or phenomenon that this research can solve, it is thus worthwhile to conduct this study as it will open up further studies to how persuasive communication cues could be used and studied for future research.

A mixture of qualitative and quantitative methods will be used by identifying a sample that will undertake the study to ascertain whether persuasive communications cues can be effectively implemented in addressing the food waste. A survey along with interviews with key stakeholders will be undertaken to bring the study to life. From a qualitative methods perspective we will seek to understand what are the motivating factors that will enable pre- and post-consumer individuals to change the behaviour in reducing food waste. This will be followed by a statistical analysis of sample size determination to contextualise the study to a specific population size which could be potential used in order environments. For this study we will look to have a mixture of stakeholders from the supply chain and customers to take part in this research study.

Thus, the problem statement is to investigate how persuasive communications cues through awareness and education strategies can be integrated into effecting behavioural changes to reduce food waste in the supply chain ecosystem.

It would, therefore, be important to ask, how could persuasive communication cues be used in an ethical manner? What are the key outcomes that could be reached if awareness of the problem was brought to the consumers attention from a reduction of household waste; and finally what retail and societal policies can be in place to ensure there is a change without being abrasive in our approach.

1.3 Research Goal

With the various literature that we have gone through – we aim to use pragmatic research to find solutions to the problem identified. According to Plooy-Cilliers et al., (2014) Pragmatic research can be described as research which aims to find solutions to specific problems by utilising both qualitative and quantitative research methods. This can be linked to the research paradigm chosen being critical realism.

Looking at one of our research questions, how has the use of persuasive communication evolved over time? Noort, Antheunisb and Reijmersdal, (2012) state that the perceived persuasive intent proves to be an important intervening variable in explaining the relation between tie strength and campaign responses. This links back to the desired response based on the education and awareness strategies to stakeholders in the supply chain ecosystem. They further reiterate that theories on persuasion knowledge could, therefore, play an important role in studying campaigning within online social networks. We further state that this can be extended to other communication platforms outside of social media using methods such as nudging and social marketing.

It is therefore important to note that with this study we are looking to unpack a multitude of collaborations with stakeholders. Which will require various forms of communication to raise awareness and educate within the supply chain ecosystem. As such Warren, Becken and Coghlan, (2016) state that the process of persuasive communication and identifying thresholds leads to a better understanding of the two-way, interpersonal process of persuasive communication resulting from “spiralling engagement” through multiple and sequential steps of communication.

1.4 Research Questions

To formulate the relevant research questions we need to understand that the purpose of our study is an integrated approach that seeks to include parties both from a pre and post-consumer supply chain ecosystem – while also including external social groups and government.

Therefore it is important to note our research problem that we identified previously which is to investigate how persuasive communications cues through awareness and education strategies can be integrated into effecting behavioural changes to reduce food waste in the supply chain ecosystem. Based on this the below are the proposed research questions:

- How can multidisciplinary strategies be integrated to help in the reduction of food waste?
- What behaviours propelled the rapid increase of food waste at a post-consumer level?
- Is there a correlation between retail marketing promotions on food and food waste?

2. Literature Review

The issue of food wastage is a global phenomenon that has affected both developing and developed nations. Even though literature reveals that there is no one universal definition of food waste - definition of food waste is not universally agreed upon (Lebersorger and Schneider, 2011), which makes studying and quantifying food waste difficult (Buzby and Hyman, 2012). Different categorizations are generated based on what materials are included, means of production, and management approaches (Gjerris and Gaiani, 2013), Thyberg and Tonjes, (2016) – it remains a growing phenomenon, nonetheless.

With this study we look to analyse various contributing factors to this namely wastage in the supply chain, key behavioural and attitudinal drivers that contribute to food wastage, the use of social marketing nudges as means to prompt customers to reduce household waste and finally the inclusion of post customer wastage into the broader system as there has been little evidence that has taken active studies to investigating this.

As such this has led us to identify our research problem statement that which is to conduct an explorative study to investigate whether a multidisciplinary approach to food wastage can effect behavioural change through education and awareness to stakeholders in the broader pre-consumer and post-consumer supply chain eco-system.

The below literature review will discuss the food wastage trends from a developed and developing nation context, key behavioural and attitudes to food waste both from a consumer and supply chain perspective and the use of social marketing and nudges as means to raise awareness from a consumer perspective.

Review of Literature

Food Wastage Trends from A Developed and Developing Nation Context

Food waste affects various communities around the world. However, some of the trends that drive food waste differ depending on the development of a country. Nahman and Lange (2013) state that on a per capita basis, overall food waste throughout the supply chain is far higher in developed countries than in developing countries. However, this does not mean that food wastage is not an issue in developing countries. They further state that in developing countries, food waste

arises mainly due to financial, managerial, and technical limitations in harvesting techniques, storage and cooling facilities (exacerbated by difficult climatic conditions), infrastructure, packaging and marketing systems (Parfitt et al., 2010). This has been identified in Southern African Development Community (SADC) region; however South Africa has been found to exhibit developed nation food waste behaviour. In contrast globally Africa, contributes approximately 18% of global postharvest food losses, the research base is too low across the continent, with most of the research stemming from South Africa Alamar, Falagán, Aktas, Terry, (2018). Looking at developed nations the major causes of food waste is mainly related to the tendency of consumers and the catering industry to buy more food than they need, and of farmers to 'leave food in the field' in response to either market forces or weather/pest-related damage Gustavsson et al., (2011); Gunders, (2012); Institution of Mechanical Engineers, (2013), Nahman and Lange., (2013). What this comparison shows us is that in as much as food waste is a global phenomenon the causes are different and as such require different strategies to raise awareness.

The effects of food waste are not only limited to mere loss of food, but this phenomenon has far reaching consequences. Nahman and Lange (2013) state that the magnitude of food waste is problematic from a social and environmental for several reasons. Firstly, a substantial proportion of discarded food is still edible, implying that it could have been used to feed those in need, if it had been better managed or distributed (Nahman et al., 2012; Oelofse and Nahman, 2013). Secondly, even in the case of inedible food waste, disposal to landfill or by incineration implies the loss of a potentially valuable resource that could have been used in other processes (e.g. energy generation or composting). In addition, the decomposition of organic waste at landfill or by incineration leads to a range of environmental and social impacts. Finally, the production of food that ends up going to waste entails wasted resources and emissions in the food supply chain Nahman et al., (2012).

In part to what is stated above, food waste is accelerated by the impacts of food system modernization on food waste generation are examined, particularly impacts related to food system industrialization, urbanization, globalization, and economic growth. Socio-demographic, cultural, political, and economic drivers of food wastage are described with emphasis on how food waste perspectives may

vary globally Thyberg and Tonjes (2016). This raises questions whether the only stakeholders actively involved in the supply chain can address this issue without the broader involvement of players from other disciplines. It then qualifies our research problem that a multidisciplinary approach is needed to address food waste in general.

The question of broader policy development comes in as key consideration as we have identified above through the literature if some of the key drivers of food waste are beyond the supply chain and consumer education. This brings insight into the best policy approaches to sustainably manage food waste. Food waste prevention policies are placed in context of the waste generating behaviours and attitudes that they address as stated by Thyberg and Tonjes (2016).

Key Behavioural and Attitudes to Food Waste Both from A Consumer and Supply Chain Perspective

Most of the literature that has been reviewed shed some light on how the supply chain is contributing to the broader problem of food waste; Food loss occurs upstream in the supply chain and previous research extensively focussed on post-harvest losses Alamar et al., (2018).

However, we are of the view that the supply chain alone is not fully responsible of this as indicated by Kim et al., (2019) both the food supply chain and households contribute to the food waste problem (Miafodzyeva and Brandt, 2013). While the need for shared responsibility is acknowledged, individual households must bear some responsibility for organic food waste. Therefore, a key consideration of consumers and how they contribute to food waste at a household level needs to be further investigated. Although there is some literature that speaks to this we found that there was a considerable gap that had reliable data that could fully articulate the contribution of households to food waste. Nonetheless with the literature we found is that – according to Kim et al., (2019) research indicates that private households are significant food waste contributors (Bio Intelligence Service, 2011; Conrad et al., 2018). Food waste costs Australian households an estimated AU \$3,800 every year (RaboDirect Financial Health Barometer, 2017). This phenomenon is not only limited to the Australia but is also found in other high-income countries with estimates suggesting 47 million tons of food waste arise from households (FUSIONS, 2016).

With the above literature we made generalisations that countries that are developed potential would exhibit similar characteristics that is reflected on the above research – this is an overlap to the initial theme in this literature review that we discussed. In a different study however, Ramukhwatho et al., (2014) suggest that from a South African perspective when evaluating the cause of why households waste so much food, respondents answered the questions concerning their behaviour when it comes to food and a list of reasons was identified. Reasons such as preparing too much food, expiry date and promotional marketing were prevalent. The types of food that was wasted the most by households were identified as largely the staple food, maize porridge, followed closely by rice and bread.

Now this brings about pertinent issues that are relating to how consumer behaviours toward food wastage. For instance, retailers having promotional food items that often prompt customers to over buy, the lack of education to package labelling and lack of meal planning on the consumer end. These should be used as starting blocks to raise awareness to consumers about food waste. From Ramukhwatho et al., (2014) study conducted, the responses obtained showed that awareness about food waste and the quantities of food being wasted in Mamelodi (South Africa) is still largely lacking.

Use of Social Marketing and Nudges as Means to Raise Awareness from a Consumer Perspective

Food waste programmes are needed to reduce waste and educate customers – this would entail various strategies that could be used. For the purpose of this study we will focusing on social marketing and nudging. Literature shows that previous food waste programs delivered at a household level feature partnerships and/or funding from governments, commercial and/or not-for-profit organizations Dai et al., 2015, 2016; Waste and Resources Action Programme, 2007, 2010)., Kim et al.,(2019). It is evident that consumers are not aware of their role in increasing food wastage as a result creative and innovative strategies will need to be employed and this means having an understanding of the consumers motivations, perceptions, attitudes and behavioural triggers towards food waste. Kim et al., (2019) suggest that a wide range of behavioural change tools exist (e.g. education, behavioural science, and policy), most of which are involuntary

leading to community criticism. Application of social marketing in its fullest extent involves the delivery of alternatives that people value and are willing to pay for. Application of social marketing, a voluntary approach to behavioural change, lacking in the food waste context (Barr et al., 2011; Takahashi, 2009; Truong, 2014), suggests further research focus is warranted. Social marketing has been shown to be effective in health-focused studies such as healthy eating (Carins and Rundle-Thiele, 2014), problem alcohol use (Kubacki et al., 2015b) and many more (Almestahiri et al., 2017; Almosa et al., 2017; Fujihira et al., 2015).

Furthermore, another strategy that is deemed to be controversial but effecting is nudging – this can help in education consumers about various ways to mitigate food waste we did mention the various reasons to lack of education earlier in the literature review. Bolos et al., (2019) suggest that many factors can influence decision making, and nudging is one of them. A nudge is a change in the way in which choices are presented, altering behaviours in a predictable way without forbidding any options or significantly changing economic incentives. As such nudging could be a viable strategy to raise awareness on food waste and getting commitment from consumers willingly.

Food waste being such a prevalent global crisis, there are two theories that stand out for the purposes of this study, namely, theory of planned behaviour Brown, Ham and Hughes, (2010) and persuasive communication theory Ajzen, (1992). The reason for this that they form a strong basis to the research problem identified as well as the questions. Referring to the research topic, there has been a fair amount of research that has been done – however, it does not link directly to food waste. It links to the related phenomenon that may have similar impacts on the environment and health. In a study looking at A cross-cultural study of the persuasive effect of fear appeal messages in cigarette advertising: China and Canada It investigates the difference in persuasibility of fear appeal messages against smoking on two cultural groups differing on collectivism, namely Anglo-Canadians and PRC Chinese Laroche, Toffoli, Zhang and Pons, (2001). Parallels will be drawn during this study, based on similar literature.

3. Research Paradigm

To understand the phenomenon of global food wastage we will need to identify a research paradigm which will be our guide to how we address the research problem identified previously. As such based on the research problem we are looking to have the stakeholders identified to be able to think critically to do the right thing and identify the truth based on the information available to them. Du Plooy-Cilliers, Davis, and Bezuidenhout (2014) state that knowledge should be used to sharpen people's critical thinking skills in every aspect so that they can become self-actualised (reach their full potential) and autonomous (free and self-governing). The main aim is to inform people about the potential threats or dangers food wastage can pose.

However, our research problem poses a complex reality as the overall environment of the retailer is not only isolated between the consumer and retailer. There are other players in the system which makes it open to influences to solving the problem at hand. As Gerrits and Verweij, (2013) state that, complex reality consists of open systems that are emergently structured. Thus, when conducting this study, we would need to be mindful of the various interactions in the system as the components (all players in the supply chain) are not isolated.

Due to the idea of looking to educate people about the effects of food wastage not only from a food security point of view but also environmental issues that arise. For this study we would be taking a Critical Realist approach – thus our thinking is justified as Plooy-Cilliers et al., (2014) refer to critical realists maintain that researchers have a responsibility to transform social relations by exposing, critiquing and changing any unjust practices in society. Once the awareness and education of the effects of food waste are known the next step would be to effect behavioural change.

With this paradigm that we have chosen we are mindful that the outcomes of the research would be a body of knowledge that would be ever evolving and relevant for a specific time. To this point it would be used to prompt a change in behaviour and policy development towards food waste. This ideal is supported from an epistemological position that we will be addressing as stated by Plooy-Cilliers et al., (2014) that social issues (in this case food wastage) which stand in the way

of social change (value driven change) towards a society (for all stakeholders in the supply chain and consumers) without domination.

Although the phenomenon of food wastage is a global one, at times it is found that some people may not be aware of the effects. This is evident in how little attention has been drawn to the managerial attitudes and approaches to food waste mitigation according to Gherbin and Adriano (2017). They further state that managerial research is critical to aid in understanding how the issue of food waste is tackled on the ground. Then from an ontological position – it is imperative that we address these limitations and realities of managerial attitudes towards food wastage by educating them to see how change is possible and thus enable them to have their independence, freedom and control based on the information available to them to be change agents. As Egbo (2005) states implicitly, researchers in the human sciences are morally compelled to use the findings of context-based inquiry to change the social world in such a way as to bridge the gap between “knowing” and “doing”, which should, in turn, lead to emancipation particularly. This is especially relevant from a store level as they are front facing with customers and can use this as an opportunity to educate consumers about food waste – as we stated upfront that household wastage is also an issue and the lack of consumers understanding packaging labels of food which will be explored further in the literature review.

The reviewing of food wastage policies from a retail level and governmental level is a critical component of this research and with this we seek to make it as a practical guide to how food wastage should be managed through the supply chain for all stakeholders. Then according to Egbo, (2005) under this arrangement, positive social transformation begins with policies that acknowledge the views, values, and intentions of social actors as presented in their own accounts. Thus, it is important for this study to provide an evidence based management approach in the form of policies from retailers and governmental structures that is based on a better appreciation of ‘what works’, as determined by the research evidence according to Tourish, (2012). Because of the critical realists’ emphasis on change, they maintain that theory should be practical and include a plan for change – thus the emphasis on the policies component of this study to equip the end user with information that is practical as stated by Plooy-Cilliers et al., (2014) when using a metatheoretical position.

The problem statement identified is not a linear approach to what kind of methodologies will be used i.e. qualitative and quantitative methods. With the study we look to balance both the qualitative and quantitative aspects of the study. As noted in the formative parts of this paper, we have made references to various stakeholders that play a part in addressing food wastage – with the methodological position we look to uncover the structural relationships between stakeholders i.e. retailers and government. This is supported by Plooy-Cilliers et al., (2014) who cement that critical realists further consider it important to look at structural relationships.

Although this study seeks to address a phenomenon that will potentially have devastating effects as the researcher we need to be mindful that this study will not be entirely value free and a level of bias will be included.

4. Research Methodology

4.1 Research Strategy

We conducted a study, where we proposed a number of methods that will assist in attempting to answer our research topic. Therefore, for this study we used a deductive approach, according Spens and Kovacs (2005) deductive research starts by scanning theory. Then, logical conclusions are derived from this theory in the form of general laws presented as ex ante hypothesis or findings. Because of the critical realists' paradigm that we are taking emphasis on change, this paradigm maintains that theory should be practical and include a plan for change – thus the emphasis on the policies component of this study to equip the end user with information that is practical as stated by Plooy-Cilliers et al., (2014) Keeping in mind that the this links with some of the theories identified in our literature review namely, theory of planned behaviour and persuasive communication theory which we tested. From then analysed these theories based on the data collected. Further Hyde (2000) states that deductive reasoning commences with an established theory or generalisation and seeks to see if the theory applies to specific instances. Which in this case is to uncover whether persuasive communication cues can influence behavioural change to reduce food waste?

4.2 Research Design

Thus, based on the critical realist paradigm, our research design took a mixed method design. This included both qualitative and quantitative research designs, for the purpose of this study we will use the definition by Johnson et al. 2007, p. 123): Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e. g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration. There, from a qualitative perspective we used cross-sectional study according to Levin (2006) the purpose of the study is to find the prevalence of the outcome of interest, for the population or subgroups within the population at a given timepoint. Therefore, with the purpose of the study we unpacked a multitude of collaborations with stakeholders. Which will require various forms of communication to raise awareness and educate these stakeholders within the supply chain ecosystem to ultimately reduce food waste. One of the advantages of using this type of study is that its according to Levin

(2006) relatively inexpensive and takes up little time to conduct, and with this study we are mindful of the budgetary limitations from a researcher perspective. We are also mindful of the possible limitations of this design approach for instance if the study were to be conducted in another timeframe there may have been developments on further awareness and education around food waste as Levin (2006) stated that the study only provides a snapshot: the situation may provide differing results if another time frame had been chosen.

4.3 Sampling Plan

For the study our sampling plan was based off non-probability sampling, the reason for this is because our sample is not easily accessible according to Vehovar, Toepoel and Steinmetz (2016) they define non-probability sampling as a deviation from probability sampling principles. This usually means that units are included with unknown probabilities, or, that some of these probabilities are known to be zero. Therefore, we will be taking using a convenience sampling approach, the reason for this is that we have time limitations to further go out and cast the net wider for our sampling. As such our sampling saw, according to Vehovar et al., 2016 the recruitment of our sample will include social ties (e.g. friends, colleagues, and other acquaintances).

The sample included the public where the survey was shared with them and the interviews we conducted by two consumer or members of the public. The reason for the selection of these two interview participants will be random. Therefore, it was ideal for this study to get the various sides on persuasive communication being a potential influencer to behavioural change.

4.4 Data Collection Instrument

Our data collection instruments was, guided by our mixed method approach as we allude to some of the instruments in the justification of our research design. Thus, from a data collection point of view, qualitatively we used surveys that had open ended questions as to further get a deeper understanding of what we are investigating. Within the same survey a mix of quantitation question were included that were closed ended. Further extending the data collection instruments we selected two participants who took part semi- structured interviews with us. Although we will be using two respondents from an interview perspective we need

to place upfront that this may not be entirely representative of the population. The respondents may also have a certain level of bias which we will try to uncover and understand their reality so that is documented. Furthermore, data sequence that we will be collecting will be concurrent and weighted towards qualitative research methods.

4.5 Data Processing and Analysis

The data analysis process entailed the processing of the qualitative interview data to identify themes and survey strands of data although collected concurrently will be analysed independently. The analysis of the quantitative survey strands results will be analysed in descriptive form including the various numbers that will be obtained from the analysis. The results of the concurrent analysis of the quantitative and qualitative data will be compared in order to come up with a concise view of results and will be detailed as narrative descriptions.

4.6 Research Reliability and Validity

From a reliability and validity perspective, because we are using a mixed method research design we need to be able to take both quantitative and qualitative measure or strategies that will limit bias and ensure that the study is trustworthy.

Because we will be using interviews as a research instrument from a qualitative standpoint the following strategies will be employed to ensure validity. We are mindful that there are three bias/threats that may threaten the validity of our study from a measurement standpoint. So, to reduce measurement errors from respondent bias, researcher bias and reaction bias. We will implement three strategies. These are from a qualitative view, firstly we will reduce the prolonged exposure of the research to the research as to reduce the researcher's own knowledge affecting the outcomes. We will use triangulation of data since we are using a mixed method research design and finally member checking (person being interviewed) will be asked to clarify what they are saying in order to reduce any forms of personal interpretation by the researcher.

Then on the other hand when looking at the quantitative aspect of the study, we can test-retest the questions that will be asked to respondents. Kirk and Miller (1986) identify three types of reliability referred to in quantitative research, which relate to: (1) the degree to which a measurement, given repeatedly, remains the same (2) the stability of a measurement over time; and (3) the similarity of

measurements within a given time period (p. 41-42). However, there is a major limitation to this as respondents are dynamic and may change over time which may threaten the reliability of our instruments. Thus, as the researchers we would propose to have a criterion of a sliding scale that will place respondents' answers in that grouping to ensure reliability of the study for future testing.

5. Data Analysis and Presentation of Results

The following analysis of the results will present these in two forms; firstly we will look at the quantitative data then followed by the qualitative results which will include the interview findings.

Firstly, with the survey we reached 20 respondents. When asked how many people lived in their household. The results were as follows 75% had a household of between two to five people, 15% one person and 10% had six and above people living in a household. The reason we asked this question was to establish how many people live in a household so as to gain a deeper understanding of their consumption habits of food and general understanding of the effects of food waste.

Below figure 1 points out the results.

- How many people live in your household?
20 responses

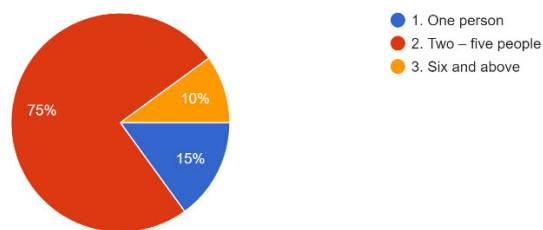


Figure 1

Therefore, the next question on Figure 2 looked to find out how these households prepared their meals for the members in the households. We found that 55% of them prepare their meals more than four times at home and 45% came in at less than three times a week.

- How often do you prepare a homecooked meal in a week?
20 responses

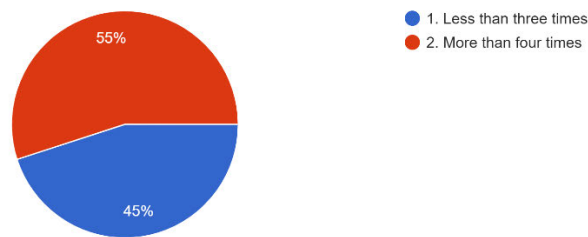


Figure 2

An interesting observation on Figure 3 was to see that a total of 80% of the participants confirmed that they order takeouts less than four times while 20% order 80% ordered less than three times. This in relation to the number of respondents who cooked meals at home was higher in relation to these findings.

- How many times in a week do you order take-outs?
20 responses

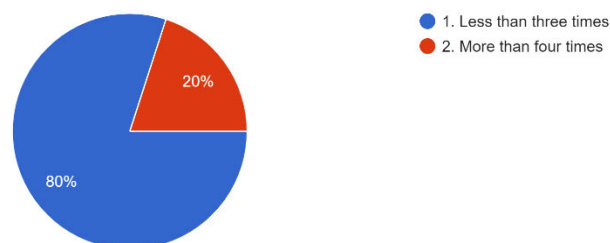


Figure 3

Therefore, considering the above-mentioned results it was also alarming the number of respondents that sometimes-consumed leftovers from take outs or homecooked meals. This painted a picture that often, the participants would be keen on consuming leftovers. Which means that we can deduce that at some point a large amount of food went to waste.

- Do you eat leftover food homecooked or takeout the next day?
20 responses

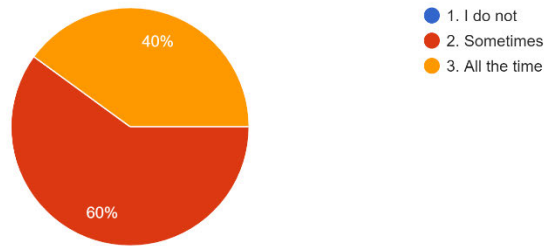


Figure 4

Having analysed the above data we can make inferences that in these households hold the potential to increase food waste. This was further corroborated by the results below when we asked whether they know about food waste? An alarming 45% indicated that they don't know much about it. 30% of the respondents informed us that they have the knowledge but do not pay attention to it. Could this be because that they are not well informed about the effects of food waste? These are questions that could lead us to further investigate why participants with knowledge would not pay attention to it. There an overwhelming 75% of respondents need more education and awareness about foodwaste.

- On a scale of 1 to 5, how much do you know about food waste management?
20 responses

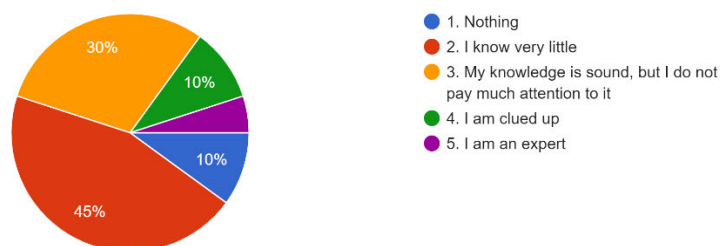


Figure 5

The next question was a build up to the previous question that saw 47.6% of respondents that they throw out very little food on a weekly basis. Even though this this the case it still begs the question that what can be done to reduce this

number along with the 33.3% that state they throw out an average amount of food. This in relation to the findings of the number of people in household is a concerning number.

- How much food do you throw out on a weekly basis i.e spoiled, expired or leftovers?

21 responses

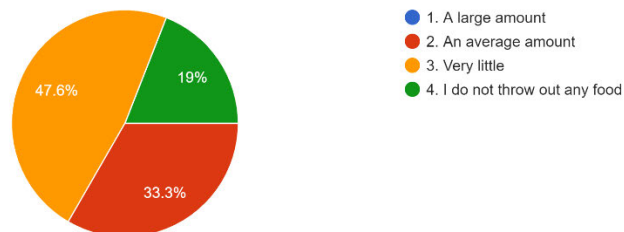


Figure 6

Further to this, even though we saw 52.4% of respondents indicating that they only purchase food only when the need arises even though the retailers may promotions. This was an indication that even though retailers may seek to prompt people to purchase based on food consumer patterns not many were swayed.

- How often do you purchase food because of retailers marking down food items?

21 responses

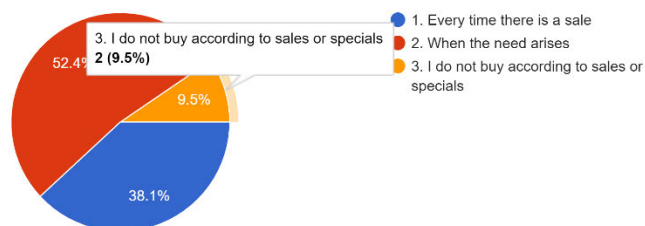


Figure 7

The results on labelling shown on Figure 8 were interesting that an astounding 63.6% of respondents indicated that check the expiration date of the label. This in turn begs the question as to why is then there were higher respondents that that threw out food based on expiration or other reason as indicated in Figure 5.

- Do you read the labelling on your food items when you purchase them to check the expiration date?

22 responses

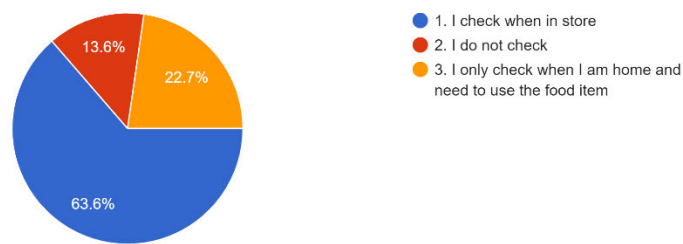


Figure 8

Having reviewed the results from the qualitative portion of the reason design we now look at the key themes that come out strong both from long form questions and interviews conducted.

Having analysed these finds we found that the from the first question asked which was *What would encourage you to minimise food waste in your household?* We picked three overarching themes being the cost of food being a key motivator to ensure that food waste is minimised within their households. The second was that respondents wanted to plan better for their meals this would help encourage them in reducing their household waste. Even though this was articulate in different forms other responding by saying that they would by what was need for a specific period, cooking enough to be consumed on the day. Ultimately this related to planning of meals within the household.

The second question asked *What would you do to help raise awareness to reduce food waste to your friends and family?* With this question we found one theme that stood out; this was education and awareness. The respondents further indicated that if they were better educated and had access to information they would be able to share that information with family and friends and educate them about the effects of food waste.

Based on the interviews we conducted a key theme that stood out from the two respondents that we interviewed is that there needs to be more education at a retail level to educate consumers about food waste. Further to this one of the respondents indicated that there needs to be an incentive-based system that looks to reward all players within the supply chain ecosystem. However, further to an incentive-based system, they indicated that a penalty-based system is also needed in order to keep retailers honest about their role in food waste. The respondents indicated that it would be ideal if the government partnered with retailers and put laws in place that will help reduce food waste. Another interesting observation from the interviews conducted was that retail brands should not use the corporate social investment as tickbox exercise to helping reducing food waste. They need to be fully involved and include social groups as well as this is not only a retail nor government issue but a societal issue. Further to this the discussion around communication channels found that our interview respondents saw social media as a impactful tool to advocate for the reduction of food waste.

6. Conclusions and Recommendations

6.1 Ethical Considerations

The following ethical consideration will be considered for the participants that will be taking part in the research. The study will not be causing harm to the participants. The reason for this is that the questions that they will be answering will be objective and will steer clear of any suggestions that may be offensive to them in terms of their beliefs, cultural and societal background.

This study will ensure the participants' anonymity and will provide the participants with a upfront disclaimer ensuring that they have the option to withdraw at anytime they feel uncomfortable during the study. Furthermore, the data that will be gathered from them will remain anonymous and that they do not have to pay to partake in the study.

The researchers will also ensure to inform the participants that their personal information will not be shared, in the event that raw data needs to be included in the appendix their names and contact details will be blacked out.

6.2 Limitations and Trustworthiness

In the section below we will consider the following limitations to the study:

- The sample size is small considering the topic that the study is looking to tackle. As various people respond differently to different communication cues thus outcomes may be specific to that sample.
- Because the study looks to address the food waste phenomenon, from a behavioural perspective participants may not reflect their true behaviour as they may think that admitting to any form of food waste is socially unacceptable especially in the context of South Africa where food security is an issue.
- The time factor is a major limitation as researchers we had a very limited time to run our data collection.
- The fact the study is looking at whether persuasive communication can effect behavioural change. Readers may associate this with the negative aspects of propaganda communication and be resistant towards the findings.

6.3 Recommendations

Therefore, based on the research conducted these are our findings:

- There needs to be a more integrated approach to dealing with food waste as a phenomenon and should not be left to one stakeholder the retailer; but should be something that involves different stakeholders in the community such as the government and social groups to come up with socials that will ultimately benefit the environment.
- Communication remains a strong form to ensure that people are aware and are educated about the effects of food waste. There if people know about this they are able to do better by ensuring they reduce their food waste footprint.
- Planning of food buying, and consumption seemed to be quite relevant thus it would important to use that as a starting point in trying to educate people the importance of planning meals for their households in order to reduce food waste. This can translate into a communications campaign that can be rolled out using various communication platforms such as social media, traditional media as well as other tactical below the line communication. This also speaks back to our theory of planned behaviour and persuasive communication theory.

6.4 Conclusions

In conclusion, it is evident that if people are informed they can make better decisions based on the information provided to them. This in a form liberate people from their current position of ignorance to knowing. Which is in line with our research paradigm being critical realism where the aim is to use information as a key driver to set free people.

Communication is an important part of the community engagement and based on this research there is room for the usage of persuasive communication as a diver to influencer behavioural change.

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Appendix A

Recordings

Research questions and answers

Appendix B