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# **Is it easier than you think?**

## **A case of food waste sorting behaviour in Follo, Norway**

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Master of Science  
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**Declaration**

I, Malin Elizabeth Diskin Nilssen, declare that this thesis is a result of my research investigations and findings. Sources of information other than my own have been acknowledged and a reference list has been appended. This work has not been previously submitted to any other university for award of any type of academic degree.

Signature: 

Date: 14.05.2022

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## ABSTRACT

The global environmental crisis demands that we ensure the reuse and recycling of materials already in existence. Recycling requires separate waste sorting by individuals. In Norway, 50 percent of food waste ends up in the residual waste, contaminating other wastes and hindering their potential recycling. After introducing a recycling system, information is the most common policy instrument utilized to influence waste sorting behaviour. A municipal waste management company in Norway, Follo Ren, administered a food waste sorting campaign which targeted three groups of the population identified as being less efficient at food waste sorting. The main objectives of this thesis are (i) to examine the impact of this information campaign and (ii) to explore whether citizens experience any situational barriers which hinder efficient food waste sorting behaviour. 19 respondents representing the three groups targeted through the campaign were interviewed in-depth using semi-structured interviews. Using theories of human action, power, and policy instruments, the findings shed light on how respondents reacted to information and the campaign and on how the identified barriers influence respondents' motivations and willingness to participate in the sorting scheme. The findings suggest that although the system in Follo is good, citizens are hindered by various physical, motivational and situational barriers which ultimately enhance the perception of effort required to participate in the sorting scheme. While information is continuously requested, its tangible effects are questionable if not combined with other policy instruments. As such, Follo Ren is advised to continue providing information focusing on how to sort, as well as why sorting is beneficial, but to combine it with physical nudges addressing the various barriers experienced by citizens. Using nudging measures is likely to increase perceptions of convenience and accessibility by decreasing perceptions of personal cognitive, physical and time-related effort required.

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# 1. INTRODUCTION

## 1.1 THE PROBLEM

Energy cannot be created or destroyed; it can only be changed from one form to another. Converting radiant energy from the sun and geothermal energy from within the Earth is what drives the processes of Earth's climate and ecosystems. Humans are dependent on energy resources derived from these conversions, such as fossil fuels, renewable energy, food and oxygen. The unequivocally necessary element for life, energy is constantly on our minds. But as Earth's surface continues to warm to temperatures exceeding those of the past 2000-plus years, our sources of energy are becoming threatened (IPCC, 2021). In fact, agricultural productivity has slumped by 21 percent since 1961 compared to a scenario without human-induced global warming (Ortiz-Bobea et al., 2021). This is alarming when we also know that approximately one third of global food produced never reaches our stomachs (Kaza et al., 2018). All that food could, theoretically, end world hunger four times over (FAO, 2019). Further, the economic costs of food loss and waste equate to around US\$1 trillion. The environmental impacts of the food lost or wasted somewhere along the food chain are immense: 8-10 percent of global greenhouse gas (GHG) emissions emanate from food never consumed. If we imagined that food waste alone represented a country, it would be in third place on the list of countries emitting the most GHGs, right behind the USA and China (Principato, 2018, p. 8). GHGs increase the amount of thermal energy that is warming the planet and threatening food production. Thus, a vicious circle is created where a third of the food produced under worsening climactic conditions is never consumed but instead creates more GHGs which further worsen the conditions under which we produce food.

All this 'wasted energy' needs to be reduced to facilitate sustainable living conditions for everyone currently alive and the future generations. The World Bank's report on global waste management, "What a Waste 2.0", posits, like so many others, that food waste challenges "relate to consumer behaviour and government policies and regulation" (Kaza et al., 2018, p. 31). Similarly, the UN's 12<sup>th</sup> Sustainable Development Goal – *Ensure sustainable consumption and production patterns* – advocates for a halving of per capita global food waste by 2030 (UN, 2021). The EU has also recognized the issue and includes requirements of 65 percent materials recycling by 2035 in its waste framework directive (European Commission, 2008). While food loss refers to the decrease in food quality and quantity during production and storage, causing it to be unfit for human consumption, food waste is predominantly related to consumer

behaviour in industrialized, high-income countries. European households are recognised as the main culprits of food waste behaviour (Principato, 2018). Food waste is thus defined as food that has reached the consumer but is not consumed for various behavioural reasons. In this paper, the definition is narrowed down further to food waste behaviour at a household level, focusing on the behaviour of sorting food waste separately from other waste categories. Throughout the paper, household waste sorting for recycling purposes will simply be termed ‘sorting’.

Norway has a high per capita consumption rate where food waste stands for 5 percent of the national total emissions (SSB, 2019; Matvett, 2020). Yearly, an average of 385 000 tonnes of edible food is wasted, which correlates to more than 22 billion NOK and 1.3 million CO<sub>2</sub> equivalents emitted. Norway has set a goal of universal food waste collection by 2023 as required by the EU 2035 targets (Follo Ren, 2018; Miljødirektoratet, 2022). Currently, 70 percent of households have the option to sort food waste. Although the infrastructure is widely in place, 50 percent of food waste is sorted incorrectly. While reducing food waste is the main goal, separating food waste from other waste categories has some clear benefits for material recycling. For one, food waste contaminates other waste categories, causing ineffective recycling of other materials. When sorted and collected separately, food waste itself can be recycled into biofuel and biofertilizer. If Norway’s target of increased material recycling through separate sorting of food waste is to be met, investigating the underlying motivational and behavioural reasons for incorrect food waste sorting is necessary.

Creating an effective recycling system requires understanding of what motivates people to recycle and what policy instruments with their incentive mechanisms will have the desired effect (Finnveden et al., 2013; Principato, 2018). Policy instruments commonly utilized to persuade individuals to adopt pro-environmental behaviours are legal (e.g., bans, standards), economic (e.g. taxes subsidies), and informational (e.g. campaigns, labelling), as well as infrastructure development (Vatn, 2015). These instruments aim to, respectively, change the framework conditions, costs, preferences and habits of consumers, and facilitate behaviours. The predominant approach to behavioural change in the context of waste sorting is to focus on preferences and habits through educating citizens (Schultz, 2002). In other words, information is the preferred policy instrument as research tends to indicate that there is a lack of information surrounding sorting behaviour and a topical knowledge-deficit among citizens (Kaza et al., 2018; Schultz, 2002). Additionally, information is a cheap and easy way for waste management

companies, who acknowledge awareness raising as a prerequisite for behavioural change, to influence behaviours (Kaza et al., 2018).

While informational measures are implemented by municipal waste management companies to foster participation in various recycling schemes, evaluating the impact of information on actual behaviour is difficult (Finnveden et al., 2013). Whether information actually reaches the intended audience - the people who are not sorting sufficiently - is potentially the most significant problem faced. Depending on how the information is conveyed, it may not be noticed by consumers, especially if they are uninterested in the topic. Further, because paying attention to information is voluntary it may be deliberately ignored by uninterested consumers (Finnveden et al., 2013). Further, irrelevant information, information competing with the values of the audience, and unclear, ambiguous and sometimes contradictory information can have significant adverse effects on sorting rates (Andersson et al., 2011). Still, information is deemed a significant policy instrument for waste management for its proposed effectiveness in affecting behaviour, its purpose in delivering procedural information and the necessity of it in combination with other policy instruments. Even in Norway, where knowledge about climate change and environmental concern is high, citizens express a need for more information about why and how to sort their waste (Mikkelsen, 2017; Fagernæs, 2018). In response to the ambiguous effects of information and education, the problem has then been broadened to investigate how to provide information in a way that will reach specific target audiences, raise awareness, and cause citizens to act on that information (Fagernæs, 2018; Løseth & Viki, 2020). This is not a straightforward process (Linder et al., 2018), but it is necessary to test whether differentiating information for this behaviour is necessary if we are to reach the goal of 65 percent material recycling by 2035 (Miljødirektoratet, 2022).

So, we are becoming more aware of the consequences of our actions and are acting to try to alter our behaviours to reduce the negative impacts we could potentially cause (IPCC, 2021). While our everyday actions as consumers of food can undergo significant changes that can reduce the amount of food wasted, there is one way we can reduce the negative impacts of the food we waste – we can make energy from it. We can do exactly what Einstein’s law of thermodynamics has taught us: convert energy from one form to another. If Norwegians put the interesting biological experiments going on inside a jar of salsa at the back of the fridge or in their nine-year old’s lunch box forgotten in a gym bag at the back of a cupboard in the food waste bin provided by their local waste collection company, what was once meant to provide energy for humans can become energy once again. At the aptly named “Magical factory” in

south-eastern Norway, food waste is turned into biogas that fuels buses or bio-fertilizer which feeds our future food (Den Magiske Fabrikken, n.d.). In a very scientific way, that's magic. But it's magic that requires effort from all of us as individuals. If we don't put in the effort and sort our scraps and leftovers into the correct bin, if we use less energy while sorting our waste and put it all in the residual waste, the magic will not happen. While putting food in residual waste will result in the food being turned into energy through incineration, it's a less efficient form of energy conversion. The conclusion from this is that, while we need people to stop wasting edible food in the first place through a variety of changes to our consumption pattern, we want people to sort food waste into food waste bins so that we can create more food and reduce emissions. How we go about this when telling people why and how to sort food waste does not seem to have enough of the desired effect is what this thesis intends to investigate.

## 1.2 CONTEXT AND PURPOSE OF THE STUDY

In response to the issue of low sorting degrees in Norway, waste collection companies, researchers and master's students have investigated the motivational and behavioural reasons for participation and non-participation in recycling schemes (Mikkelborg, 2017; Fagernæs, 2018; Løseth & Viki, 2020; Heller, 2017; Refsgaard & Magnusson, 2009). A lack of information has unanimously been identified as a significant cause of inaction, reflecting a trend within recycling behaviour studies internationally (Miafodzyeva & Brandt, 2013). Specifically, findings suggest that it may be necessary to differentiate information for different groups of the population. Based on this knowledge, an intermunicipal waste management company in the south-east of Norway, Follo Ren, designed and implemented an information campaign that targeted three groups of the population which were identified as inefficient at sorting food waste into the appropriate, green bags. The target groups were (1) young males aged 20-29, (2) families with young children and (3) adults aged 55+ without children at home. The campaign, titled *'It's easier than you think'*, was implemented in the autumn of 2021 and will continue until May 2022. The campaign aimed to remove a physical barrier that has been brought up frequently in customer feedback to Follo Ren, namely a lack of food waste bags, as well as reminding people to use said bags for all their food waste (P. Jensen, personal communication, 2<sup>nd</sup> February 2022). Examining the effect of this campaign will be necessary if we are to know whether the knowledge concerning motivations and behaviours that substantiate the campaign is sufficient for addressing the issue of insufficient food waste sorting. Further, Follo Ren requested an exploration of potential experienced physical barriers

among respondents, as they have frequently received customer feedback indicating physical barriers to sorting.

An initial, common evaluation has been undertaken, wherein a small-scale weight-based evaluation of the amount of food waste bags compared to residual waste bags present in the collection bins was conducted in January 2022. The results from this residual waste analysis show that there has been a slight increase in the amount of food waste bags, from 21 percent (November 2019) to 24 percent. Although this could indicate a positive effect of the campaign, there may be other factors contributing to this increase. The purpose of this paper is to conduct an in-depth examination of the effects of the campaign on behalf of Follo Ren, as well as explore whether there are other approaches the company should utilize in future to increase food waste sorting. Specifically, an investigation of potential physical and contextual elements that may bar the effects of information will be undertaken. Also termed *situational* determinants of behaviour, as opposed to *personal*, we are here talking about the contextual situation in which an action occurs, e.g., the location of collection bins, types of materials collected, and the attributes of the collection system (colour, shape and labelling of bins) (Schultz, 2002). Physical barriers seem to be a significant issue for people and beg being paid attention to (Bernstad, 2014). Further, we do not perform our behaviours in a vacuum where we act solely based on our own knowledge, preferences and values. Humans are social beings, and consequently our behaviours are influenced by the social context we are acting in (Miafodzyeva & Brandt, 2013).

The aim of this study is then to examine the effects of the differentiated information campaign and explore the potential importance of situational barriers for food waste sorting. I will do this by examining the experiences of the campaign by individuals from each target group and by exploring the reasons for why food waste ends up in the residual waste bin. The findings from such an investigation could provide Follo Ren with valuable knowledge about what approaches may be necessary to reduce the amount of food waste that is sorted incorrectly in Follo. This will aid the municipal waste management company in reaching its goals.

### 1.3 OBJECTIVES AND RESEARCH QUESTIONS

The first objective of this study is to examine the effects of an information campaign issued by Follo Ren in the autumn of 2021. This campaign was created based on knowledge concerning the effectiveness of information for recycling behaviour, as well as on a target group analysis which identified the three target groups who received facilitated, targeted information aimed

at diverting food waste away from residual waste and into the designated green food waste bags. The second objective is to determine whether there are existing situational barriers which inhibit the effect of information on food waste sorting behaviour in Follo, as requested by Follo Ren (personal communication, 24<sup>th</sup> January 2022). The following research questions were formulated to facilitate an evaluation and discussion of the campaign's suitability and effects, as well as an exploration of potential experienced situational barriers:

- 1) What are perceived and experienced barriers to sorting among respondents from each target group?
- 2) In what way do the identified barriers influence respondents' food waste sorting motivations and behaviour?
- 3) Was the differentiated information campaign an appropriate approach to combating low food waste sorting degrees in Follo?
- 4) What future approach(es) could increase food waste sorting efficiency in Follo?

#### 1.4 STRUCTURE OF THE PAPER

To set the scene, the paper begins with an introduction to the topical background, focusing on the global issue that food waste constitutes, and the household waste system in Norway and Follo specifically. Following this comes a chapter on theory and existing empirical research on the topic in the form of a literature review. The next chapter details the methodology used before I introduce the information campaign that is examined. Next, the findings are presented, analysed and discussed in combination. The paper culminates in an advisory conclusion for Follo Ren, guiding the future work the company should pursue to increase food waste sorting rates.

## 2. TOPICAL BACKGROUND

Before moving on to the specific topic of food waste sorting behaviour, it is relevant to introduce the global issue of food loss and waste. The topic will narrow down to how food waste alone is an issue being addressed in high-income countries through the contribution of food waste recycling. Following this, I will describe the recycling scheme in Follo, the region studied in this thesis. This provides the overall topical background for this thesis. The theoretical foundation will be outlined in chapter 3.

### 2.1 GLOBAL FOOD WASTE

Human behaviour has caused most of the sustainability issues we currently face, including global warming, water and food shortages, pollution and biodiversity loss (Steg & Vlek, 2009). Greenhouse gas emissions from food production and distribution, environmental contamination from unsustainable agricultural practices, and conversion of land for agriculture all pose direct threats to the environment. Avoiding such potentially catastrophic global environmental change, as predicted by the IPCC (2021), requires the promotion and adoption of sustainable food waste handling and behaviour (Linder et al, 2018). Each year, the average global person wastes 270kg of food, contributing to the global food loss and waste issue (Kaza et al., 2018). Food loss and waste combined constitute a seriously non-productive use of natural resources which further have negative social and economic impacts – it is thus much more than an environmental issue (FAO, 2019). Based on the causes of food depletion and major geographic differences, we differentiate between food loss and food waste. The former is an issue mainly relevant in developing countries where a decrease in the mass of food occurs at various stages of the food chain prior to consumption (Principato, 2018). Causes of such losses overwhelmingly relate to inadequate technology and systems that require infrastructure investment, improved agricultural practices and competences, as well as changes to technological and financial regulations. Food waste, which is consumable food that is discarded for a number of reasons, occurs mainly at the consumer level in industrialised, high-income countries. While only constituting 16 percent of the world's population, these countries generate 34 percent of global waste, mainly as a function of consumer behaviour as well as government policies and regulations (Kaza et al., 2018). In Europe, 42 percent of food is wasted at the consumption level, of which two-thirds is food waste that could have been avoided through better planning (Principato, 2018). Although decreasing food loss along the food

supply chain is of importance, discarded food – food waste – has the potential of being more productively utilized through composting and energy recovery.

Food waste happens towards the end of the food chain when food is discarded due to excess, spoilage or other behaviours that cause unnecessary waste of food (Principato, 2018). Some food waste is unavoidable, such as peels, bones and other leftover products. Recycling these scraps into biogas or biofertilizer has clear environmental and societal benefits (Kaza et al., 2018; Miljødirektoratet, 2022). If all food waste, including avoidable food waste, is discarded of in a manner that redirects it towards biogas or biofertilizer production, it will at least provide a much more sustainable product that can help reduce emissions in both food production and transport sectors. If not disposed of in this way, food waste is either landfilled, leading to potential methane emissions, or incinerated, a less efficient use of the energy food contains. Both lead to a waste of resources, including the land, water, labour and energy used to produce food.

The production of food is resource-intensive, and the loss or waste of food is indirectly linked to several environmental impacts such as water and air pollution, as well as the GHG emissions emanating from production, storage, transportation and waste management (Schanes et al., 2018). Indeed, food loss and waste cause 8-10 percent of global greenhouse gas emissions and reducing this could lead to significant environmental gains (Kaza et al., 2018, p. 31). The one third of global food intended for human consumption that is lost somewhere along the food chain has a high carbon footprint, ecological footprint and water footprint (Principato, 2018). This not only contributes to global warming through the release of GHGs, it also constitutes a waste of water and land used for production. Approximately 1.4 billion hectares, or 30 percent of all available agricultural land, is used to produce food that ends up being wasted, clearly a wasteful and unsustainable practice. Fostering sustainable agriculture requires changes in resource management and production practices, while simultaneously minimizing the losses and waste of food produced. Socially, all this wasted food threatens food security in producing nations (Kaza et al., 2018). As referred to earlier, the amount of food wasted each year could feed the people suffering from hunger four times over – at least. While reducing food waste in high-income countries and urban contexts won't directly improve situations in middle- and low-income countries characterized by food insecurity, it can indirectly affect access to food by reducing the demand for large quantities of food. Another prevalent concern related to the excess use of land for agriculture, is the rate of biodiversity loss caused by human action, namely unsustainable agricultural practices (IPBES, 2019). The indirect environmental and



social benefits from reducing the impacts of food loss and waste are then reduced emissions and amelioration of issues such as water scarcity and biodiversity loss.

So, why is household food waste sorting important when the reduction of waste seems to be the most pressing issue? Although reducing the amount of food loss and waste is the overall long-term goal, recycling the high amount of food waste produced by households optimises the recycling process (ROAF, n.d.). When food waste is incorrectly sorted into residual waste, it contaminates the recyclable materials and reduces the effectiveness of the sorting facilities. The latter relates to how the sorting facilities that household waste is sent to can sort different fractions of dry waste like plastics but not organic wastes as these contaminate the other waste categories which then go unnoticed by the sorting robots. Correctly sorted food waste is recycled into biogas and biofertilizer through controlled decomposition. These substitute environmentally damaging fuel for transport and help create new food in a more sustainable fashion. To go back to the analogy about energy which introduced this thesis: while we need to reduce the amount of waste generated at a household level to limit the waste of resources, we can also turn our food waste into something useful, into new food or fuel through producing bio-fertilizer and biogas (Den Magiske Fabrikken, n.d.).

## 2.2 HOUSEHOLD WASTE MANAGEMENT IN FOLLO, NORWAY

Waste management is about collecting, taking care of and making use of our resources in the most efficient way, while at the same time still making sure we avoid contaminating the environment (Sortere, n.d.). How to make the most effective use of the resource that waste comprises is a continuous project where material recycling and incineration allow us to turn our resources into new products and energy. The way this management is organised is guided by governmental legislation and regulation. Norway follows EU legislation and has set targets for waste disposal and recycling in accordance with this (Sortere, n.d.). National legislation regulating waste management further are The Pollution Control Act (Forurensningsloven) and the Waste Directive (Avfallsforskriften) which aim to protect the environment against pollution, reduce waste, and promote sustainable waste management practices through recycling. As is common internationally, municipalities have responsibility for collecting household waste in compliance with the legislation (Kaza et al., 2018). This means that they also have the responsibility of ensuring appropriate management of the waste from the disposal phase, through collection, redistribution and final treatment. Waste disposal is mandatory, and each household pays a fee to their own municipality, which covers costs for collection and

treatment of household waste, as well as recycling stations. This type of fee relies on the voluntary act of source separation for recycling among citizens, which is generally considered a positive norm in Norway (Heller, 2017). There are different ways of organizing the waste sorting systems, depending on the recycling option available to the waste management company. Often, several municipalities in a region cooperate through establishing an inter-municipal waste management company, such as in the Follo region.

Follo Ren is an inter-municipal waste collection company owned by four municipalities in the south-east region of Norway, just south of Oslo: Frogn, Nesodden, Nordre Follo and Ås. The company is responsible for collection, transport and treatment of household waste as dictated by the Pollution Control Act (Follo Ren, 2018). Each year, Follo Ren collects approximately 57 000 tonnes of waste, constituting 500kg of waste per citizen, compared to 433kg of household waste per citizen in Norway in general (Follo Ren, 2018; Fagernæs, 2018). The four municipalities hold approx. 60 550 household waste containers which are emptied every 14 days.

The company has a main vision of improving household waste handling without putting pressure on the environment through focusing on citizens, sustainability and economy (Follo Ren, 2018). The aim is to facilitate intuitive and easy household waste sorting both physically and with the aid of good customer service. The sustainability goals relate to providing services that reduce primary resource extraction by facilitating recycling and reuse. Economically, the company aims to contribute to a circular economy by keeping resources in circulation through recycling, to provide services at a fair price balanced between environmental and economic considerations, and to be a sustainable role model through the environmental choices the company makes. Citizens are provided with information and guidance at all levels of waste handling. Finally, the company works to develop the current system further to benefit citizens.

Based on these principles, the sorting scheme is organized so that households can sort waste into four main categories: food waste, residual waste (also containing plastics), paper waste, and glass and metal waste, with the addition of three recycling stations where citizens can deliver bulkier waste, garden waste and dangerous wastes (Follo Ren, n.d.a). The first three are separated into two kerbside collection bins, one for paper waste and one for both food waste and residual waste. Detached houses usually have personal bins, while semi-detached housing and apartment blocks have larger, shared bins. Glass and metal waste is not collected at kerbside and needs to be brought to a collection point. Follo Ren redistributes the different

waste fractions and has agreements that ensure that environmental and economic considerations are taken. Of interest here is the journey food waste takes.

Based on these guiding principles and the national goal of 65 percent material recycling by 2035, Follo Ren created a system for food waste sorting in 2017. Food waste sorting was conveyed as an “easy, effective and environmentally friendly waste disposal solution” (Follo Ren, 2020). Citizens were, and still are, provided with food waste bins and specialized green plastic bags intended for food waste free of charge. Prior to the implementation of separate food waste sorting, citizens received information about why and how to sort food waste separately, as well as how to access new bags (Follo Ren, 2017). This information is still available on the company website as well as being frequently addressed in the information magazine distributed to all households in Follo three times a year. Follo Ren construct four-year plans that intend to guide the company towards the main goals to be reached in 2035. To reach these goals, they formulate plans and measures to implement during the four-year periods. The current ambition regarding food waste is to reduce the amount of food waste that ends up in residual waste from 56 percent in 2017, to 25 percent in 2024 (Follo Ren, 2021). In 2021, this had been reduced to 30 percent. Previous and current measures implemented to ensure the goal for 2024 is met have focused on increasing the availability of the food waste bags through provision of containers to housing cooperatives as well as monitoring and refilling these with new rolls of bags.

Food waste is sorted into green plastic food waste bags provided by the company. When full or for another reason removal is necessary, bags are transferred to the collection bin situated outside the household. Every two weeks, Follo Ren collect the waste from these bins, which also house residual waste bags, and transport it to a nearby sorting and processing facility. Here, the green food waste bags are separated from the residual waste bags and redistributed to the processing plant, ‘Den Magiske Fabrikken’, where the plastic bags are removed before the food waste is treated and converted into biogas or biofertilizer (Den Magiske Fabrikken, n.d.).

Municipalities thus have the responsibility of ensuring the collection and redistribution of waste for recycling. Accordingly, they are also responsible for making sure that their citizens participate in the recycling scheme to provide correctly sorted waste fractions in preparation for recycling. In Follo, citizens’ participation is promoted through the provision of the necessary equipment accompanied by descriptive and educational information. Food waste has

received special attention in their information magazine and leaflets, due to the unsatisfactory sorting degrees reported in biannual residual waste analyses. A specific campaign aimed at increasing citizens' awareness of the ease of sorting food waste was implemented in the autumn of 2021 and will be outlined in chapter 5.

### 3. LITERATURE REVIEW AND THEORETICAL BACKGROUND

The aim of this chapter is to summarize some relevant literature concerning predictors and determinants of food waste sorting behaviour, both personal and contextual, as well as outline the use of policy instruments to influence intention and behaviour. These topics are relevant for the discussions in chapter 6 concerning how barriers influence sorting motivations in Follo, as well as what future approaches can be beneficial considering these barriers.

#### 3.1 THEORIES OF HUMAN ACTION

Household food waste sorting behaviour needs to improve (van der Linden & Reichel, 2020; Miljødirektoratet, 2022). Exploring the reasons for lack of participation in developed waste sorting systems, researchers have focused on a variety of variables that could influence households' waste sorting participation and behaviour (Miafodzyeva & Brandt, 2013). While results are often ambiguous or non-significant, the common variables found to affect sorting intentions and behaviour once the necessary infrastructure has been provided are moral norms, convenience, environmental concerns and information. While diverse and complex, combined, these variables explain some of the variance in sorting behaviour between different groups of the population (e.g., Barr et al., 2013; von Borgstede & Andersson, 2010; Mikkelsen, 2017; Fageræs, 2018; Schultz, 2002; Schanes et al., 2018). Previous research has thus approached the topic of consumer food waste with the aim of identifying and measuring cognitive, motivational and structural factors that drive or impede waste sorting participation.

In two comprehensive reviews of food waste behaviour literature, Schanes et al. (2018) and Principato (2018) found that the use of Ajzen's Theory of Planned Behaviour predominates in research. This theory explains behaviour as determined by the intention to perform it, which reflects the motivation to act. It connects internal processes and determinants such as attitudes, norms and knowledge to socio-demographic variables as influences on intention. While the studies applying this theory have been able to predict intentions, these intentions rarely translate into action. This is known as the 'value-action' gap (Blake, 1999 in Schanes et al., 2018, p. 980). What this means is that cognitive aspects such as attitude, motivation and intention cannot be assumed to predict food waste sorting behaviour. One explanation for the lack of predictability is the neglect of the influence of contextual factors such as infrastructure (Principato, 2018; Steg & Vlek, 2009). In response to this, social practice theory has been applied to broaden the perspective on food waste related behaviour and explain the gap between intention and behaviour (Schanes et al., 2018). This broadening implies the

inclusion of social, economic and cultural as well as material contextual aspects as determinants of food waste related behaviour, connected to a broader set of food related behaviours and practices, refuting the idea that it is purely an individual's problem. A further contribution from social practice theory is the understanding of personal attitudes and motivations as dynamic, meaning that they can both predict a behaviour and be influenced by contextual aspects. Studying and understanding both psychological and contextual determinants of food waste related behaviour in relation to each other can provide more in-depth understanding of individual participation in food waste sorting. Before moving on, I comment on the use of the terms action and behaviour in this thesis. A more encompassing term, behaviour refers to the long-term habit or social norm of sorting. Action refers to the one-time performance of that behaviour.

### 3.2 EXPLANATORY VARIABLES FOR WASTE SORTING BEHAVIOUR

Research on household waste sorting behaviour has focused on a variety of variables. In a comprehensive literature review of studies on recycling behaviour between 1990 and 2010, Miafodzyeva and Brandt (2013) summarized and divided the trends into four theoretical groups: socio-demographic, technical-organisational, socio-psychological and study-specific (Miafodzyeva & Brandt, 2013). These categories encompass the various variables that have been used to try to explain sorting behaviour as well as drivers and barriers to participation. Figure 1 depicts the variables and how they can explain waste sorting intention and possibly behaviour. Socio-demographic and socio-psychological variables help explain which groups of the population are more or less likely to participate in sorting. These have been studied previously in Norway, providing a somewhat clearer picture of the trends in the population concerning what factors can predict whether an individual participates in separate waste sorting (Refsgaard & Magnussen, 2009; Mikkelsen, 2017; Fagernæs, 2018; Elstad, 2021). Studies focusing on technical-organizational variables have studied the importance of how the physical infrastructure is organized. The way the physical context may be influencing participation is also included in the category situational variables, an under-category of socio-psychological variables. This is because they explain how the physical infrastructure or wider context within which sorting occurs influence motivations and behaviours. In the following, a summary of the main findings within each of these categories internationally and in Norway is outlined.

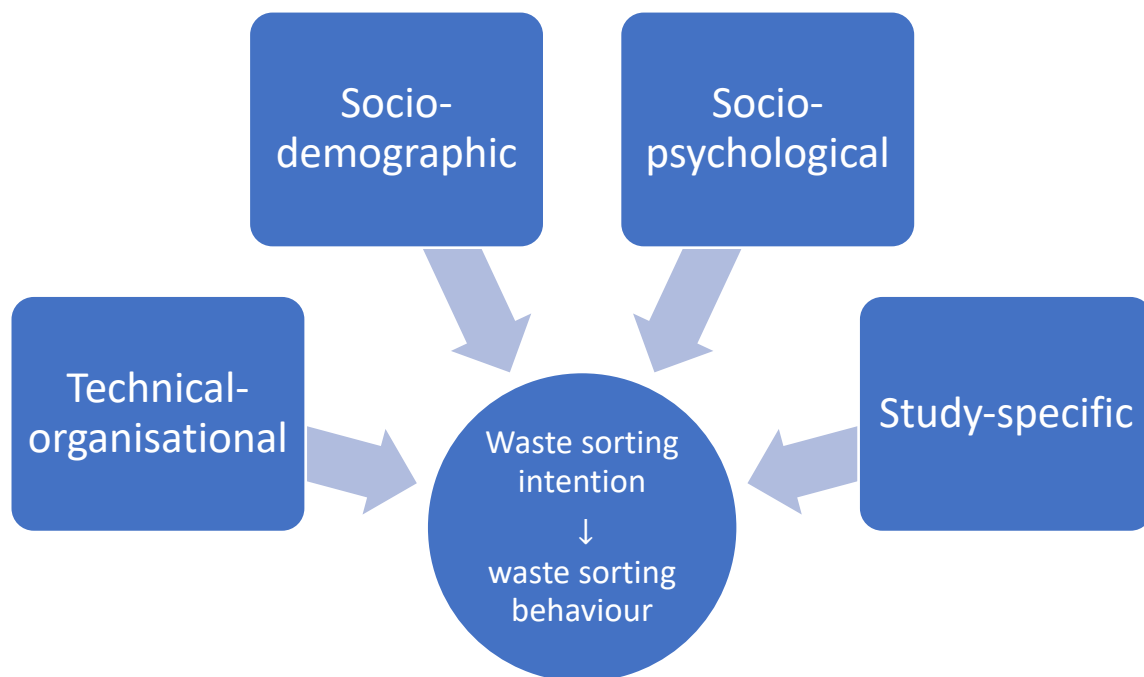


Figure 1: Conceptualization of variables explaining recycling behaviour. Adapted from Miafodzyeva and Brandt (2013, p. 222)

### 3.2.1 SOCIO-DEMOGRAPHIC VARIABLES

Socio-demographic variables, also referred to as socio-economic variables, refer to descriptive information about individuals and household characteristics, such as age, gender, income, education and type of dwelling (Miafodzyeva & Brandt, 2013). Of these five variables, only age and income were found to be significant predictors of waste sorting in the literature reviewed by Miafodzyeva and Brandt (2013). However, the few studies that include the variable ‘type of dwelling’ consistently found it to explain sorting degrees.

The majority of studies including gender as a variable have found it to be an unimportant variable, yet some studies indicate that females tend to engage more willingly in waste separation. Similarly, some studies on the influence of education on participation find that higher education somewhat predicts higher rates of participation, while at the other end of the scale, lower education levels cannot explain a specific level of participation (Miafodzyeva & Brandt, 2013; Mikkelsen, 2017). Results thus tend to be rather ambiguous for both gender and education level.

Income seems to predict participation in waste separation in most cases where higher income correlates with higher participation rates (Miafodzyeva & Brandt, 2013). However, in some studies looking at willingness to participate this does not hold. The suggested explanation for

this is that the opportunity cost of waste separation in terms of the time and effort it requires may reduce willingness to participate among those with high incomes.

Age as a variable has provided both significant and non-significant results in relation to sorting (Miafodzyeva & Brandt, 2013). A significant finding is that, over time, waste sorting becomes an integrated part of society, and concurrently age becomes a less significant factor. In Norway, Mikkelborg (2017) found that the age group 20-39 are least likely to participate in separate sorting of food waste and plastics. In the same study, he found that the higher the concentration of this age group in an area, the lower the sorting degree was in that area. In a follow-up study, Fagernæs (2018) found that members of this age group report high intentions of sorting their waste and perceived behavioural control, yet this does not necessarily translate into action.

The few studies that have included type of dwelling as a variable have provided unambiguous results indicating a significant correlation between dwelling type and sorting behaviour (Miafodzyeva & Brandt, 2013). In general, private, single-family detached housing correlates with higher sorting degrees, whereas apartment buildings or semi-detached housing have lower degrees of waste sorted. One explanation given for this is that there is more space available for sorting facilities and storage in detached housing. Earlier findings from Norway mirror these results, adding that the longer people have lived in the same place, the more they participate in the sorting scheme (Halvorsen, 2012). Mikkelborg's (2017) results also reflect these findings, specifying that apartment buildings have a significantly lower degree of food waste sorting. In Norway, semi-detached housing was more similar to detached housing than to apartment buildings in terms of sorting degrees, even though semi-detached and apartment buildings tend to have shared waste bins, whereas detached houses commonly have private collection bins.

### *3.2.2 TECHNICAL-ORGANIZATIONAL VARIABLES*

While individual psychological factors and motivations influence behaviour, these are not the sole determinants. There are many contextual factors that can facilitate or hinder behaviours as well as influence motivations (Steg & Vlek, 2009). Research on the influence of the physical attributes of a waste sorting scheme on behaviour has introduced various terms for this factor. In this thesis, I have chosen to use Miafodzyeva and Brandt's (2013) umbrella term 'technical-organizational variables' to encompass the physical attributes of a waste sorting scheme and its influence on behaviour.



Household waste sorting behaviour relates to the local collection scheme, which varies throughout the world, ranging from no organised collection to kerbside collection of multiple waste types (Miafodzyeva & Brandt, 2013). There is an inherent coordination conflict between collectors and households here in terms of convenience, or physical accessibility. The closer to the individual, e.g., kerbside collection, the more convenient it is for households, which further increases willingness to participate in the waste sorting scheme. This may imply a higher cost for the collector, both timewise and economically. However, as collection companies are bound to comply with regulations, kerbside collection is favoured due to the higher participation and sorting rates that follow.

As early as in 1999, Sterner and Bartelings (1999) recognised that providing the appropriate infrastructure that facilitates waste sorting had a significant effect on people's willingness to participate in a waste sorting programme, and more so than an economic incentive. Since then, several studies have argued for the necessity of an accessible and suitable waste sorting scheme (e.g., Barr et al., 2013; Lange et al., 2014; Principato, 2018; Schultz, 2002; Stoeva & Alriksson, 2017; Timlett & Williams, 2011). Without the necessary sorting facilities, environmental attitudes and awareness have little influence on waste sorting behaviour and other policy instruments will have little effect (Barr et al., 2013). In fact, merely providing simple and intuitive waste sorting facilities can increase sorting rates significantly. Similarly, the placement and accessibility of collection bins and temporary storage facilities for recyclable waste has been shown to be a contributing factor (Timlett & Williams, 2011). Convenience is significantly correlated to sorting behaviour and refers to “the transparency of the collection scheme: how easy it is to understand and ‘manage’ (use)” (Miafodzyeva & Brandt, 2013, p. 226). It relates to handling problems, ease of access, storage space, collection frequency, cleanliness of recycling stations, ease of use, etc.

In a Norwegian study by Refsgaard and Magnussen (2009), easy and friendly sorting systems were frequently mentioned as important for appropriate use by citizens. In general, the design of the collection scheme as well as the physical infrastructure heavily influences convenience as perceived by citizens, which then consequently influences and partly determines behaviour (Miafodzyeva & Brandt, 2013). Lange et al. (2014) found that the subjective perception of walking distance to a recycling station was easily influenced by competing goals and intentions, despite pro-environmental intentions. In an experimental study comparing the effects of an information campaign and the installation of source-separation facilities for food waste, Bernstad (2014) finds that information had no significant effect on sorting levels,

whereas the installation of sorting equipment provided long-term improvements. Stoeva and Ariksson (2017) confirmed such findings in a comparative study which showed that a lack of satisfactory sorting facilities, both real and perceived, correlated with low sorting rates. When facilities were in place and people were satisfied with the system, attitudes began to predict behaviour more heavily. A compelling contribution comes from De Young (1990) who reported that attitudes toward recycling are generally the same for both non-recyclers and recyclers, and that the determining factor is their perception of the convenience of waste sorting. It is therefore fruitful to focus on conveying 'how to sort' rather than 'why to sort'. While facilitating and optimizing household waste sorting infrastructure is an obvious prerequisite for participation in a waste sorting scheme, it should not be assumed that there is no room for improvement and maintenance of the system to ensure continued participation.

### *3.2.3 SOCIO-PSYCHOLOGICAL VARIABLES*

Socio-psychological variables are the most documented and encompass a broad range of cognitive and normative factors that can influence waste sorting behaviour (Miafodzyeva & Brandt, 2013). The conceptual framework includes motivational and situational factors under this category. I have broadened this by including the concepts of bounded rationality and habits as these recurrently appear in literature to explain environmental behaviour (e.g., Henriksson et al., 2010; Lange et al., 2014; Vatn, 2015).

#### **3.2.3.1 Motivational factors**

Motivational factors are summarized as general environmental concerns, moral norms, legal norms and social norms (Miafodzyeva & Brandt, 2013). Moral norm, or personal moral norm, is the most frequently studied variable and is generally important for explaining waste sorting behaviour; individuals are more likely to sort if they feel a personal responsibility to perform the action. Conversely, individuals holding a negative motivation towards recycling will experience greater barriers to performing the action.

A second, frequently studied motivational factor is general environmental concern, or pro-environmental attitude (Miafodzyeva & Brandt, 2013). Internationally, the results are ambivalent. In Norway, however, Bruvoll and Nyborg (2004) found environmental concern to be a significant predictor of waste sorting behaviour. An interesting point brought to light in more recent studies is how the influence of the attention to environmentalism in the media has raised awareness and concern, yet not caused a behavioural change (Miafodzyeva & Brandt, 2013).

While moral norms work from within and can govern an individual's intention to sort waste, social norms go beyond the individual and put pressure on individuals both with and without personal internal motivation (Miafodzyeva & Brandt, 2013). Social pressure or expectation comes from significant others, from partners and children to neighbours and friends. One study in Norway found that pro-environmental individuals experienced their social networks as echo-chambers, wherein the members of the network reinforced each other's opinions on climate change and food waste (Elstad, 2021). A reflection the author draws from this is whether individuals surround themselves with like-minded people, or whether they are affecting their social circle through conversation and behaviour. On a smaller scale, within families, the dynamic between children and parents is interesting. Children often receive environmental education at school and may influence behaviours at home, whilst environmentally aware parents may increase their waste sorting behaviour to influence a sense of responsibility to protect the environment through small, every-day actions in their children. The latter is grounded in how we are often affected by our upbringing, which relates to the variable 'past behaviour' which I will return to. While social norms have been documented to have an effect, some studies have concluded that they only operate in the early stages of a waste sorting scheme (Miafodzyeva & Brandt, 2013). When the scheme has become well established, social influence tends to diminish as individuals will have developed habits and attitudes and are less prone to external influence.

Research discussing the limited effects of information campaigns has identified infrastructure and convenience as factors necessary for increased waste sorting (Andersson et al., 2011; Bernstad, 2014; Park et al., 2020; Timlett & Williams, 2011). Bernstad (2014) found an increase in source-separation as well as an increase in the separation of food waste following the installation of sorting equipment in households. Further, the installation of food waste bins simultaneously introduced a social norm: that everybody in the area should separate food waste. An information campaign focusing on a behaviour strongly influenced by a social norm would, on the other hand, be less effective if the social norm was not in place prior to the campaign. What this suggests is that to introduce the social norm of food waste separation, installing the correct equipment in all households is the necessary first step. This is more so due to the significant influence social norms have on sorting behaviour (Barr et al., 2003; Nigbur et al., 2010, both in Bernstad, 2014, p. 1321). In sum, the installation of food waste bins in households increases convenience and normalizes the separation behaviour for everyone also by creating a social norm.

Last of the motivational factors is legal norms, a rarely investigated variable which has provided inconsistent results (Miafodzyeva & Brandt, 2013). On a household level, legal norms refer to the perception of duty to sort one's waste as instilled by governmental bodies (Hage et al., 2009). Although research has not shown a legal norm to strongly influence individual sorting behaviour, its role should not be neglected. Personal moral norms are not created in a vacuum but rather through social interactions and/or by legal interventions which over time become internalised (Hage et al., 2009). This can create analytical difficulties where the norm may be expressed as personal, and the impact of legal norms is discounted. Legal norms may therefore be mediated through personal moral norms.

### 3.2.3.2 Bounded rationality

Behavioural scientists investigate why humans act the way they do. In classical economic theory, humans were assumed to behave rationally and predictably based on egoistic motivations aimed at maximizing individual utility (Vatn, 2015). Individuals are assumed to have full information and will sort their waste according to the level of benefit it gives them (Principato, 2018). If sorting is more costly than not sorting, there will be no sorting. Behavioural scientists now accept that humans do not have the capacity to process all relevant information and thus cannot decide rationally in all given situations (Vatn, 2015). This acknowledgement of our limited capacity to reason and rationalise is known as bounded rationality. One of the most influential books in the field of decision-making behaviour is Herbert A. Simon's *Administrative Behaviour* (1966) (Grenness, 2012). In this book he introduces the concept bounded rationality, referring to how our decisions are not the result of fully rational choices. The concept of rationality concerns partly the goals of our actions, partly the relation between goals and action, and partly the relation between goals and means. Thus, there are at least two prerequisites for a behaviour to be formed: the goal must be rational, meaning it has been consciously set based on ambitions and ability, and the action, or the means to realise the goal, must be the most appropriate action for the relevant goal (Grenness, 2012). To put this into relevant perspective, when formulating goals that rely on individual participation, a company needs to be aware of bounded rationality. This implies setting a realistic goal and providing the means to reach that goal. A prerequisite for this is examining and understanding the potential barriers to the behaviour.

In a study of waste sorting behaviour in the UK, Lange et al. (2014) extended Ajzen's theory of planned behaviour by adding bounded rationality as a variable and found that the subjective perception of a barrier – distance to recycling facilities – is a better predictor of behaviour than

the actual distance. This means that simply changing a physical barrier might not increase sorting behaviour; it may be more fruitful to focus on changing biased perceptions of the costs of sorting. Although intentions may be strong, competing goals can render the intention to sort susceptible to contextual variables such as time or effort required. Identifying factors responsible for such biased perceptions of the costs of waste sorting can enable a more comprehensive understanding of what influences sorting behaviour. Targeting such obstacles to acting on pro-environmental intentions can help increase participation in a waste sorting scheme (Lange et al., 2014).

### 3.2.3.3 Habits

Bounded rationality thus refers to how humans make decisions that are not fully reasoned or reflected upon but are rather influenced by external factors and circumstances. Recurring actions often become automated as a result of social processes determining the way to act, resulting in habituation (Vatn, 2015). Habits can be individually as well as socially constructed patterns of action, in the latter case often existing in the form of conventions and norms. Some habits can be specifically constructed with the intention of creating a norm. Waste sorting is an example of a norm that is the result of decision makers intentionally promoting a specific behaviour which has then become an internalized routine, or habit (Thomas & Sharp, 2013 in Bernstad, 2014, p. 1321; Vatn, 2015).

A habit is then a behaviour that occurs automatically. Precluding the automation of waste sorting, we find the reflection by decision makers that recycling is a necessary part of waste management, and this requires individual participation. Altering the conditions within which this habit occurs, to improve recycling rates for instance, disrupts the automatic performance of a behaviour. Thus, creating new waste sorting habits can prove difficult if considerations about the disruption caused are not taken.

Bernstad (2014) suggests that fostering a continuation of waste sorting as a habit requires focusing on creating convenience. Convenience influences the behaviour, not the intention – that's where attitudes and motivations come in. Intentions are a less reliable predictor of an action than a habit. Thus, rather than attempting to influence attitudes and behavioural motivations, there should be an increased focus on creating a well-functioning infrastructure for the separation of household food waste. Bernstad (2014) suggests that this includes not only installing equipment, but also providing guidance on placement of that equipment to optimize the behaviour and minimize perceived inconvenience. This works to reduce the perceived

burden of waste sorting, surpassing our limited cognitive abilities to reason about every action. It is therefore beneficial to assume bounded rationality when creating new waste sorting systems as it demands the creation of convenience that will then foster the creation of habits.

#### 3.2.3.4 Situational factors

While the following situational variables can also be categorized as technical-organisational, and the following repeats some of what was discussed in chapter 3.1.2, Miafodzyeva and Brandt (2013) argue that they belong to the socio-psychological group due to their connection to individuals' perceptions and personal traits, more so than the physical design of the waste sorting scheme. A first large-scale situational variable worth mentioning is the influence that inefficient management practices on international, national and local levels can have on household waste sorting participation (Stoeva & Alriksson, 2017). Instead of motivating sorting behaviour, a recycling programme can thus function as a barrier by creating uncertainty about the effectiveness of recycling (Henriksson et al., 2010). Miafodzyeva and Brandt (2013) identify three further situational factors: information and knowledge, past behaviour and personal effort.

Information and education have a significant and positive correlation with waste sorting behaviour (Miafodzyeva & Brandt, 2013). At the base, awareness raising is a key requirement for waste sorting: if citizens do not know they are supposed to sort, they will not sort. The same applies if they do not know how, and further, for some, not knowing why constitutes a barrier. Information about the routine of source-separation is necessary at the implementation phase, and continued information of this sort has been requested by citizens (Mikkelborg, 2017; Fagernæs, 2018). Such additional information aimed at preserving necessary knowledge among citizens is often arranged as an information campaign. Refsgaard and Magnussen (2009), supported by Fagernæs (2018), argue that information should be specific and individual-oriented. Their study in Norway showed that even if participants received information, they did not necessarily understand it and perceived it as too vague, general and unhelpful. Overall though, knowledge is still a prerequisite for participating in sorting behaviour and providing information about how and why to sort is essential and effective (Principato, 2018; Schultz, 2002; von Borgstede & Andersson, 2010).

Waste sorting at a household level requires individual participation and effort. Integrating source separation into daily routines requires facilitating storage space in a way that suits the individual and the physical household, possibly washing and separating materials, transporting

the sorted waste to the collect bin or collection point, and dedicating time to these activities. This has been categorized as an external facilitator, often termed effort. Personal barriers may be so significant that the sheer effort required may hinder waste sorting behaviour. While several studies find support for the significant inhibitory influence of effort (Miafodzyeva & Brandt, 2013), Hornik et al. (1995) suggest that personal norms and convenience are more explanatory for lack of behaviour and function as the barrier that increases the perception of personal effort.

An interesting but understudied variable is that of past behaviour. The idea behind this factor is how an individual's experience in the past can significantly influence current intentions (Barr et al., 2013). In fact, previous experience can lower the perception of effort, suggesting that individuals who have sorted in the past are more likely to continue this behaviour in new settings and under new waste sorting schemes (Miafodzyeva & Brandt, 2013).

#### *3.2.4 STUDY-SPECIFIC VARIABLES*

The last group of variables identified by Miafodzyeva and Brandt (2013) encompasses a wide range of relatively unstudied and specific factors that relate to specific studies. There are some trends within this category of variables, where issues related to population density, political allegiance, religious identity, ethnicity, sense of community, immigration and waste amounts are mentioned. The Norwegian studies by Mikkelsen (2017) and Fagernæs (2018) both found that non-ethnic Norwegians participated less in waste sorting than ethnic Norwegians. Communication problems, language barriers and lack of knowledge explained the low sorting participation. While intention to participate in local waste sorting systems is strong among new immigrants, they are hindered by the language barrier and express a need for frequent and specific information (Fagernæs, 2018).

In sum, for waste sorting to occur, individuals need to have sufficient information to know that they are supposed to sort, how to sort, and to a certain degree why they need to sort. Creating conditions within which sorting can become habitual is the most optimal but requires assuming bounded rationality and facilitating the action in a simple and convenient manner (Linder et al., 2018). Implementors must explore and consider the various complex and interconnected factors that can inhibit participation. Understanding how perceptions of inconvenience and effort, as well as potential competing motivations and goals may intervene and hinder sorting behaviour among certain individuals is crucial (Park et al., 2020). Taking all these things into account is not an easy task. There have been various attempts to alter the conditions within

which sorting occurs to test what can increase sorting degrees, where informational and structural measures have proven the most effective, as is common for most environmental behaviours (Principato, 2018; Steg & Vlek, 2009; Timlett & Williams, 2011). The above has presented the many potential explanatory factors for waste sorting behaviour, and in the following, I will give a description of the various approaches to ensure participation.

### 3.3 APPROACHES TO INCREASE WASTE SORTING PARTICIPATION

#### *3.3.1 USING POLICY INSTRUMENTS TO PROMOTE ENVIRONMENTAL BEHAVIOUR*

This section introduces the rationale behind the use of different policy instruments. Reaching the defined goal of 65 percent material recycling by 2035 includes the implemented measure of separate food waste sorting. Ensuring compliance with the measure requires knowing what policy instrument or combination of instruments will work in practice. Evaluating what to do needs to include consideration of the perceptions, interests and values that are involved (Vatn, 2015). The choice of policy instrument includes evaluating its effectiveness and efficiency in attaining the goals of the measure by considering its legitimacy in the relevant context. This section will therefore begin with a description of the incentive mechanisms behind the different policy instruments to explain why certain instruments are more suitable in certain contexts. Following this will be a more detailed description of information as a policy instrument as that was the approach chosen by Follo Ren, and finally a section on nudging theory. These concepts comprise the relevant theories for a discussion of research questions 3 and 4.

A policy instrument is a publicly controlled instrument that is used to influence particular actors to carry out identified measures in order to reach formulated policy goals (Vatn, 2015). Policy instruments used to promote environmentally friendly behaviour are administrative, economic, legal or pedagogical. These instruments involve different dimensions of power, which further induce different responses in individuals (Vedeld et al., 2003). Power can be coercive, remunerative or normative (Vatn, 2015). Responses are viewed as having cognitive, normative or strategic dimensions. The cognitive dimension concerns how individuals perceive the problem and its legitimacy, as well as the perceived effectiveness of the means of achieving the goal (Vedeld et al., 2003). A prerequisite for such perceptions is knowledge of the problem and the reasoning by individuals concerning their belief in the effectiveness of measures intended to reach these goals. The normative dimension relates to whether individuals perceive the goals and means to reach these as legitimate in the sense that they are justifiable and fair goals. Strategically, affected actors may attempt to avoid the dictum of the instrument if they



do not view it as legitimate. Creating a policy mix that will increase individual waste sorting participation requires understanding of the incentive mechanism of the different measures (Park et al., 2020).

Policy instruments and measures require different types of power to ensure compliance (Vedeld et al., 2003). The state holds coercive power, which in modern society often refers to structural and rule-based forms of power, relating to legal instruments (Vatn, 2015). Further, organizations and firms have a similar coercive power to command but are themselves subject to rules defined by the state. Responses are typically normative as the behaviours that laws dictate tend to become societal norms, as well as strategic since individuals have a desire to avoid punishment. The legitimacy of legal instruments lies in the equality it incurs. However, normative responses concerning the fairness of a legal instrument can limit its legitimacy.

A second form of power is remunerative power, which relates to making people act in certain ways by imposing economic incentives. While economic power is most typically found in markets, it can be utilized by the state through instituting taxes or providing subsidies (Vatn, 2015). Through altering relative prices, actors are assumed to adapt in a way that is profitable to them. A tax, for instance, can then influence individuals to adopt a behaviour – the measure – that has been deemed desirable or optimal to reach the formulated goal. While this calculative, or cognitive, response may provide the desired impact on behaviour, the instrument must also be legitimate. Cognitively, this means that those affected by the instrument should experience it as rational. Further, it should be experienced as normatively reasonable and fair. In the case of waste sorting, introducing new policy incentives not only influences the monetary cost of sorting, but also the societal norm to sort for recycling purposes (Halvorsen, 2012). The new incentive can strengthen existing norms if it sends the message that recycling is a governmental priority or weaken norms by allowing households to feel that it is acceptable to purchase the recycling services instead of participating in sorting themselves.

Finally, we have normative power, which rests on the capacity to influence action through influencing perceptions, preferences, interests and values (Vatn, 2015). Normative power relies on the existence of societal conventions and norms that dictate the desired behaviour. Pedagogic instruments seek to alter individuals' attitudes, knowledge levels and actions through conveying information and knowledge. There are two dimensions to the incentive mechanism of this instrument. Cognitively, it aims to change individuals' level of knowledge

and competence so that they choose to act differently. Normatively, the instrument aims to influence attitudes, values and norms so that they prefer to act in the desired way.

Pedagogic instruments have a different power structure than economic and legal instruments (Vatn, 2015). They have a more sympathetic profile in that they rely on trying to alter behaviour through influencing attitudes, perceptions and interests, which is more legitimate for an action that is voluntary, such as household waste sorting. Pedagogic instruments allow us to design, explain and prescribe a behaviour cognitively while simultaneously normatively address what should be done and why (Vedeld et al., 2003). Individuals are free to determine whether they participate in the behaviour but are influenced so that their intentions to sort might increase.

An additional approach that rests on influencing behaviour in a more legitimate manner is nudging (Thaler & Sunstein, 2008). Nudging tools are frequently used to indirectly influence individuals to act in accordance with regulations or goals and can be a productive addition to information where they can nudge people to act on their intentions. They presume a cognitive understanding of a behaviour and therefore function well in combination with informational measures. I will return to nudging in section 3.3.4.

Deciding what type of instrument to use in a given situation then includes evaluating what instrument will be viewed as legitimate by those affected and deciding what response is the most desirable and effective in reaching the defined goal. Any policy instrument can be adapted to target particular socio-demographic groups of a population, as well as to target different behaviours and objectives. In relation to environmental problems and waste sorting specifically, some of these instruments become less optimal. Individuals cannot be assumed to act simply out of fear of apprehension or from what is calculatedly optimal to do from a self-interested point of view. Instead, assuming bounded rationality and accepting that emphasizing an environmental behaviour relates to promoting certain values and attitudes can be more fruitful. Then the most legitimate policy instrument is pedagogic (Halvorsen, 2012; Principato, 2018; Thaler & Sunstein, 2008; Vedeld et al., 2003).

### *3.3.2 INFORMATION*

As attention to food waste has increased at a policy level in Norway, the focus on raising awareness and providing information to influence attitudes, correct information deficiencies and reduce barriers on an individual level has increased (Schultz, 2002; Kaza et al., 2018; Principato, 2018). In Norway, research aimed at identifying the motivations and behaviours

connected to waste sorting has provided a somewhat clearer picture of the situation that municipal waste management companies are operating in (Elstad, 2021; Fagernæs, 2018; Mikkelborg, 2017; Saure, 2018; Heller, 2017). Sorting of household waste seems to be influenced by either a personal norm motivated by being good for the environment or a social norm of doing the right thing (Heller, 2017). Further, sorting participation is positively influenced by the belief that recycling can improve environmental quality. Attitudes towards waste sorting can then be affected by informational measures, mandatory sorting, social norms, and public debate about environmental issues (Halvorsen, 2012). Informational campaigns are heavily used in most countries as they can change norms and attitudes, thus increasing household waste sorting without the risk of the adverse effects economic incentives produce.

Information influences motivations and behaviours through increasing knowledge about a topic (Schultz, 2002; Vatn, 2015; Principato, 2018). The more knowledgeable people are about a topic, the more likely they are to be aware of and care about the consequences of their actions. Lack of waste sorting participation is commonly explained as being caused by a knowledge-deficit, which is then remedied with information (Schultz, 2002). This approach refers to the belief that a behaviour – low sorting participation – is the result of a lack of knowledge. The assumption is then that there is a need to educate people about the reasons for performing a specific action as well as how to perform said action. While this is in fact correct - knowledge is a major prerequisite for sorting behaviour (von Borgstede & Andersson, 2010; Hornik et al., 1995) and well-created information campaigns do increase knowledge about recycling - it rests on the assumption that the relationship is causal, i.e., that knowledge leads to behaviour change (Schultz, 2002). In reality, the increase in knowledge following information campaigns rarely leads to significant, long-term behavioural changes (Schultz, 2002).

Despite the limited documented effect, information campaigns have proven to be an important environmental policy tool as they raise awareness, can nudge the public and may lead to voluntary behavioural participation (Park et al., 2020). Therefore, campaigns are an especially important tool for recycling, which relies on the voluntary participation of citizens in sorting the household waste. The behaviour relies on a cognitive and normative understanding of individual household waste sorting as a legitimate measure (Vedeld et al., 2003). There are a few drawbacks to information campaigns: tangible effects can be difficult to measure; the effects can be reduced if messages are conveyed inappropriately for the situation; and other factors can inhibit the campaign's intended effects (Andersson et al., 2011; Bernstad, 2014; Bruvoll & Nyborg, 2004; Park et al., 2020; Timlett & Williams, 2011). In terms of motivation,

creating a feeling of responsibility among citizens to sort can have both positive and negative effects: it can increase sorting efforts and create a ‘warm glow’, a pleasant feeling that one is doing good, or in situations where they do not sort, create a ‘cold shiver of not giving enough’ (Bruvoll & Nyborg, 2004). Thus, creating a stricter norm for sorting that requires more from citizens could increase the cold shiver. While sorting efforts increase, the behaviour has provided a social cost where people do not feel good about their action, undermining the motivation of ‘doing good’.

The point is that, although knowledge alone isn’t an important motive for sorting waste, a lack of knowledge can be a significant barrier to waste sorting. Therefore, it is not surprising that information as a policy instrument has gained traction as a tool for increasing waste sorting (Schultz, 2002). The approach is common practice among municipal waste management companies as an effort to increase sorting among citizens because it is a cheap and easy policy instrument to implement that may produce instant, tangible results (Kaza et al., 2018; Linder et al., 2018). Recognising the short-lived nature of the effects of information, Linder et al. (2018) created an information leaflet based on insights from environmental psychology and behavioural economics to test whether the added insights had a significant effect on food waste sorting in a district in southern Stockholm (Sweden) over time. The results indicated a statistically significant increase in sorting over an 8-month period, exemplifying the need to incorporate insight from different disciplines that have identified psychological barriers to sorting behaviour.

### *3.3.3 DIFFERENTIATED INFORMATION*

While information is an important policy tool for waste sorting, it may not always reach the targeted individuals or groups whose behaviour is not optimal (von Borgstede & Andersson, 2010). Even though personal norms have been found to predict sorting behaviour, they can also dictate whether an individual seeks information about waste sorting when it is lacking. Halvorsen (2012) points out that information to improve sorting has been heavily used in most countries and with the unsatisfactory results so far, we can assume that the individuals that have not yet been convinced will be hard to reach. When investigating what factors could improve attention to information, von Borgstede and Andersson (2010, p. 2794) found that individuals with neutral or negative attitudes towards waste sorting “may not perceive that they lack knowledge – they may feel they are well-informed but suspicious about the necessity or effectiveness of recycling”. They recommend framing information in a different way than with

a focus on environmental issues to reach individuals whose attitudes do not align with environmental messages. Differentiating information to different target groups is recommended as this has a higher potential of influencing behaviour. Park et al. (2020) also emphasize the importance of considering the target population's interests, and advise policy makers to carefully tailor messages to the particular circumstances.

### *3.3.4 NUDGING*

When individuals have the information necessary for performing the action yet still do not participate, there is a non-regulatory and non-economic intervention that can promote behaviour change: nudging (Hohle & Nilsen, 2022). A nudge-intervention is altering an aspect of the context within which decisions are made to steer behaviour in a predictable direction (Thaler & Sunstein, 2008). Nudging theory is based on how we often act unconsciously, because the action is automated as a habit (Hohle & Nilsen, 2022). Decisions may also often be irrational, impulsive and inconsequential. They are influenced by factors that 'rationally' should not matter, e.g., the name of a meal on a menu, that the chocolate is placed by the checkout counter or what your neighbour is doing. In a similar manner, most people are aware that it is more beneficial for their personal health and the environment that they walk or bike, yet they still choose the car – because it is what they are used to, because it is raining, or because the bicycle is inconveniently placed at the back of the garage. Because environmental issues are typically complex and intractable, they often cause inaction among individuals who do not see how their personal behaviour changes can influence the global problem (Gifford, 2011; Vatn, 2015). Further, individuals may not pay direct attention to environmental issues because they are not personally affected (Gifford, 2011). Such lack of perceived behavioural control and environmental numbness can result in a 'tragedy of the commons', where each individual can opt out of performing an action, causing a knock-on effect when impacts of the behaviour falter due to lack of participation (Thaler & Sunstein, 2008). These examples relate to the cognitive shortcuts humans take which cause misinterpretation of information and misjudged decision-making. Nudging theory utilizes this knowledge of human action and decision-making to facilitate a decision-making context so that the action which is the most beneficial for the individual and/or the environment is the most simple and intuitive to perform.

Nudging is about retaining individuals' freedom of choice without utilizing financial incentives, providing additional information or influencing attitudes (Thaler & Sunstein, 2008). It is an instrument suitable for influencing habits and behaviour and can be important in

combination with other policy instruments such as infrastructure development, information, injunctions, prohibitions, taxes and economic incentives (Hohle & Nilsen, 2022). Nudging can be especially beneficial for promoting environmental behaviours as it can be utilized to change unsustainable habits. There are five main types of environmental nudges: (i) changing the physical environment, (ii) preselection, (iii) social norms, (iv) removal of barriers and (v) attractive names. (i) concerns making small or large changes to the physical environment in which decisions are made and includes using labels, painting the bicycle road in a specific colour, as well as how information is presented on a website. (ii) relates to how additional choices such as whether you pay for climate-compensation on a flight-ticket are automatically added and need to be actively removed instead of being actively added. (iii) concerns how behaviour is contagious, a fact which can be utilized to influence others to act in a certain way by displaying the action. (iv) is about understanding what obstructs people from acting in desired ways and addressing the relevant barriers instead of assuming other barriers. This can also be turned around, wherein one can create a barrier to decrease instances of unsustainable behaviour. Lastly, (v) concerns giving environmentally friendly options or products more attractive names than their counterparts. These nudging types can be combined and adapted for the specific behaviour in want of changing and are a flexible instrument on the rise in many municipalities in Norway (Hohle & Nilsen, 2022).

To sum up, there are several intertwined factors that can influence an individual's intention to sort their food waste. The literature reviewed here largely agrees that the provision of equipment that facilitates separate sorting is the main prerequisite. Several studies specify that there should be a focus on creating convenience as a means to overcome some of the inhibiting effects of other variables. The motivational, physical and psychological variables that explain the various rates of participation require municipal waste management companies to utilize a variety of measures to improve sorting degrees. Providing information to increase knowledge has been a common and somewhat effective approach, but newer research and experience suggests that it is important to recognize the diversity of motivations and barriers influencing sorting behaviour. Facilitating the adoption of sorting habits in a way that appeals to different groups of the population requires differentiating the information in a way that reaches the target group. Whether this approach is the key to improving sorting participation among individuals lacking impetus is a discussion I will turn to in chapter 6.

## 4. METHODOLOGY

This chapter describes methodological choices made throughout the research process, as well as the techniques for collecting and analyzing data. This includes the choice of research strategy, as well as the design of and decisions connected to the in-depth interviews, concerning sampling, data analysis, ethical considerations and limitations.

### 4.1 RESEARCH STRATEGY

Prior to the research process, the thesis objectives and their accompanying research questions were assessed to determine what data were required. The research questions were formulated as follows:

- 1) What are perceived and experienced barriers to sorting among respondents from each target group?
- 2) In what way do the identified barriers influence respondents' food waste sorting motivations and behaviour?
- 3) Was the differentiated information campaign an appropriate approach to combating low food waste sorting degrees in Follo?
- 4) What future approach(es) could increase food waste sorting efficiency in Follo?

These questions reflect the research purpose and the type of informational knowledge sought. In this case, I am seeking an understanding of the experiences of individuals. Choosing a qualitative approach is beneficial here due to its strengths in gathering in-depth data that can be compiled and used to understand the behaviour that is being studied (Grenness, 2012, p. 159). Qualitative in-depth interviews were therefore conducted to provide data that will help me answer the research questions.

Choosing qualitative interviews allowed me to delve more deeply into people's experiences, thoughts and ideas surrounding food waste sorting at home. Yearly, Follo Ren performs customer satisfaction surveys. These are structured as quantitative interviews conducted via telephone and include among other things questions concerning satisfaction with the local facilities and with the information distributed. It is through these surveys that the company has received the feedback that helped formulate the research objectives of this thesis. Further, the media analysis and residual waste analysis performed as the preliminary evaluation of the campaign were quantitative and gave a prior indication of what the overall effects of the

campaign were. We also sketched ideas of potential physical barriers beforehand, based on prior discussions within Follo Ren concerning such potential barriers (P. Jensen, personal communication, 24<sup>th</sup> January 2022). With prior knowledge of expressed issues, as well as information about the reach of the campaign and an indication of a positive change in food waste sorting behaviour, we were interested in asking respondents about their experience with the campaign. This would then help us understand what elements of the campaign were successful and can be repeated, and potential adjustments that need to be made both to the campaign and to the sorting system in general.

The choice of a qualitative approach to this project was deliberate due to its flexibility. Qualitative researchers prefer to describe phenomena as seen through the eyes of those being studied (Bryman, 2012). This entails structuring the research process as lightly as possible to allow for valuable new insights that the researcher might not have predicted. Such an approach was necessary for this thesis to allow for a true and thorough examination of respondents' experiences with both the campaign and the waste sorting system in Follo. This approach is called grounded theory, which stresses the importance of allowing theory to emerge from data. In grounded theory, the researcher continues collecting data until theoretical saturation is achieved (Bryman, 2012). This approach requires the researcher to go back and forth between the problem statement and the data collection as a consequence of how data often forces a revision of the original problem statement. Making presumptions about what the findings will be is desirable to avoid so as to avoid colouring the research prior to data collection. Instead, the flexible approach of grounded theory is chosen to allow for new insights and findings to emerge from the data collection.

## 4.2 DESIGN AND METHOD

Having decided on a qualitative strategy, the next step was to define the research design and choose methods for primary data collection and analysis. The research design was influenced by the research objective of examining the impact of the campaign conducted by Follo Ren. With this outset, the research is a case study of that particular differentiated information campaign in the Follo region. As Follo Ren had conducted initial evaluations following a predefined methodology (outlined in chapter 5), the formulation of the qualitative method was affected. Throughout the project, I had access to the quantitative data from the initial evaluations and used these to formulate the research questions. As a case study is an intensive examination of a particular situation, it is typically accompanied by more in-depth interviews



of members of the study setting (Bryman, 2012). Semi-structured in-depth interviews were thus chosen for this thesis with the objective of gaining more thorough accounts of experiences regarding food waste sorting and the information campaign to complement the initial campaign evaluations performed by Follo Ren. Semi-structured interviews are performed using an interview guide detailing specific topics and questions one should cover (Bryman, 2012). This allows the interviewer to gather the information needed to answer research questions, while also providing a more flexible framework to operate within. The benefit of a qualitative case study such as this is that it can test and challenge theoretical assumptions using real-life data, as well as uncover unanticipated findings worth exploring. In addition, it often has high empirical validity (Bryman, 2012).

The next step in the process was to define the units of study. With the campaign as the basis, the defined target groups provided a delineation of study objects based on a combination of age, gender and general life-situation. This meant that respondents were to be from one of the three target groups: young males aged 20-29, families with young children and adults aged 55+ without children living at home. I aimed to interview an equal number of respondents from each target group.

#### 4.3 SAMPLING

This section details the sampling approach and final sample. As already mentioned, the study objects were pre-defined as the groups targeted through the campaign, which influenced the sampling approach. The criteria for sampling were twofold: (i) the respondent must fit into one of the target groups; and (ii) the respondent must live in one of the four municipalities which Follo Ren operates in.

I began sampling respondents in February 2022 and continued until the beginning of April 2022. Respondents were recruited through convenience sampling whereby I used my personal network as a springboard to find relevant respondents. This entailed asking friends and family whose network coincided with one of the target groups to help me recruit participants. Additionally, employees at Follo Ren asked acquaintances to help me sample for the category ‘children with families’ as this was lacking in my personal network. Following recruitment, each respondent was sent an email with an information letter containing a short summary of the research project, details about privacy concerns, and a consent form (Appendix 2).

The final sample consists of 19 individuals. This number was determined as sufficient based on two factors: (i) the time constraints of performing in-depth interviews with accompanying transcription, coding and analysis; and (ii) after having performed approximately 11 interviews, I began to see recurring trends in respondents' answers both within and across target group borders, so by 19 responses sufficient theoretical saturations were deemed fulfilled. Although the aim was to interview an equal number of respondents from each target group, I landed on a total of 19 interviews as the recruitment process provided me with an extra participant in the group families with young children. Table 1 gives an overview of the characteristics of the respondents regarding target group affiliation, gender, municipality, housing type, number of people in the household and number of children living at home (where relevant). Target group affiliation is depicted through the first number in the respondent code: 1 corresponds to young males aged 20-29, 2 to families with young children and 3 to adults aged 55+ without children living at home.

TABLE 1. OVERVIEW OF RESPONDENTS' INDIVIDUAL CHARACTERISTICS (FOLLO, NORWAY, 2022)

Respondent code	Gender	Municipality	Housing type	Number of people in the household	Number of children living at home
1.1	Male	Nordre Follo	Apartment	1	-
1.2	Male	Ås	Student collective	6	-
1.3	Male	Nordre Follo	Apartment	1	-
1.4	Male	Nesodden	Semi-detached	1	-
1.5	Male	Nesodden	Detached	2	-
1.6	Male	Ås	Apartment	1	-
2.1	Female	Ås	Detached	4	2
2.2	Female	Ås	Detached	6	4
2.3	Female	Nesodden	Semi-detached	4	2
2.4	Female	Nesodden	Semi-detached	5	3
2.5	Female	Nordre Follo	Semi-detached	4	2
2.6	Female	Nesodden	Semi-detached	4	2
2.7	Male	Nordre Follo	Semi-detached	4	2
3.1	Female	Nesodden	Detached	2	-
3.2	Female	Nesodden	Detached	2	-
3.3	Male	Nesodden	Detached	1	-
3.4	Female	Ås	Semi-detached	2	-
3.5	Female	Frogn	Detached	2	-
3.6	Female	Frogn	Detached	1	-

#### 4.4 DATA COLLECTION

The semi-structured interviews followed an interview guide. The guide was structured in a theme-oriented manner that created a natural flow and flexibility of questions, as well as detailing possible follow up questions. It was formulated using pre-defined concepts and themes which would make coding and analysis more efficient. I received help with the formulation of the guide from a contact person at Follo Ren to ensure that the interview would provide useful answers for the purpose of guiding future work by the company. It was reviewed by my supervisor and the NSD before being tested on three people prior to the first interview. The complete interview guide is available in Appendix 1. Interviews were held continuously and simultaneously to sampling to reduce time constraints, beginning in March 2022 and ending with the last interview at the beginning of April 2022.

The 19 interviews had an average duration of 21 minutes. As they were meant to be semi-structured interviews, I followed the interview guide flexibly, allowing the conversation to flow naturally according to the responses I received. The structure of the interview guide began with a section regarding the individual characteristics of the respondent, where age, type of dwelling and household composition were of interest. I then moved on to asking for a description of their personal household waste system, as well as their food waste disposal and sorting behaviour, asking specifically about situations where they may sort food waste into the residual waste bin. This led on to questions about their experience with information from Follo Ren and whether they had noticed the campaign advertisement and green bag delivery. The interview guide included questions regarding social and personal norms for waste sorting, as well as their general environmental attitude, motivations and behaviours. At the end of the interview, I asked the respondent to summarize the most common situations and reasons for them sorting food waste into the residual waste bag. I tried to conduct the interviews in a manner that allowed respondents to reflect on the sorting scheme in Follo to prompt reflections about the potential barriers they face when sorting.

Due to the pandemic and the restrictions that were in place at the beginning of 2022, I planned to conduct interviews digitally. Interviews ought to be conducted in a place where the respondent is comfortable (Bryman, 2012). After almost two years of home office and restrictions, I assumed that most potential respondents would be familiar with a digital meeting platform, which additionally allows them to choose a comfortable location. To assure the most comfortable option was available for all respondents, I included the option of meeting

personally. Only two respondents opted for a physical meeting. Both these interviews were conducted at their workplace, a school on Nesodden. The other 17 respondents were comfortable with using a digital platform and were allowed to choose the one to their preference to remove any digital difficulties or discomfort on their end. Zoom and Microsoft Teams were used as for the digital interviews. Recordings were saved as audio file only, with permission from respondents, before being transcribed and coded, in line with guidelines by the Norwegian Centre for Research Data (NSD), which I will discuss in section 5.6.

The communications manager at Follo Ren, P. Jensen, was also interviewed as she holds the information on the construction, enforcement and evaluation of the information campaign, as well as knowledge about the sorting landscape in Follo in general and earlier information measures. Her knowledge of media evaluations was of essence as this is a field I am unfamiliar with. There were several occasions where we communicated, both more informative, semi-structured interviews where I had specific questions about the campaign, and more unstructured and clarifying conversations to ensure the information I had written in the chapter about the campaign was accurate.

#### 4.5 DATA ANALYSIS

After conducting the interviews, they were transcribed and analysed. To reduce the amount of effort spent transcribing, I utilized a transcription programme in Microsoft Word. Although this cut down the time needed for transcribing, I had to listen through and correct each transcript. This then became part of my reflection process around the answers respondents gave and began the initial coding and analysis of the answers. Answers were categorized and coded according to the type of explanatory variable they related to, as depicted in the conceptual framework, to prepare for the analysis.

Answering research questions 1 and 2 required delving into respondents' answers from the interviews. Answers were categorized according to the type of barrier they represented to facilitate a discussion of their effects on motivations and behaviour. Research question 3 required the evaluation performed by Follo Ren in combination with the expressed campaign effects brought forth in interviews. Finally, research question 4 demanded synthesizing the findings from the first three research questions to discuss future pathways. When analysing the interviews, answers were categorized according to the target group they belonged to and the behavioural explanations expressed. In the next section, I discuss some ethical considerations as well as some possible limitations and assessments.

#### 4.6 ETHICAL CONSIDERATIONS

Research often entails ethical concerns, so to protect respondents from any form of harm associated with the study, as well as to protect the integrity of the research itself, some considerations were made. Firstly, a data management plan including a summary of the intended research process and the interview guide were submitted to the NSD in the beginning of 2022 to help ensure ethical standards were met. The NSD approved the project without any need of alteration. Throughout the sampling process, respondents were informed of the confidential treatment and the potential extended utility of the data for Follo Ren. Each respondent received information regarding the purpose of the project and their rights as respondents (Appendix 2). Included in this was their right to withdrawal at any point during the research process and their right to access the data collected from their participation. When interviews began, I ensured that the respondents were familiar with their participation purpose and rights, checked if they had any questions, and asked whether they consented to being recorded. Each respondent also provided written consent, a method of receiving consent approved by the NSD.

As the responses were to be anonymous in this thesis, details that could identify the individual were exempt from the text. The interview recordings were performed either using the inbuilt recording function on Zoom or Microsoft Teams or using an approved transcription application and saved on a password-protected hard drive connected to the university which only I have access to. While correcting transcripts, I removed all personal information, and saved the documents on the same password-protected hard drive. To identify the respondents in the analysis, they were assigned a personal code coinciding with their target group.

#### 4.7 LIMITATIONS AND ASSESSMENT

Despite the justification of methodological choices, a few limitations and implications of the research should be considered. Limitations are commonly evaluated using validity and reliability by looking at the four criteria of credibility, transferability, dependability and confirmability (Bryman, 2012). Relevant to consider for this research are sample selection, data collection, analysis and possible research bias. Concerning the data provided by Follo Ren, these were created outside of my control and I had no interference with them other than using them for the analysis. Therefore, this section will refer solely to the qualitative data.

#### *4.7.1 DELIMITATIONS AND SCOPE – SAMPLING*

As this is a 30-credit thesis set within the time frame of one semester, some delimitations were made concerning the scope of the research. With the added time constraint chosen by delivering the proposal in January 2022, a choice made so that the thesis project could be formulated in collaboration with Follo Ren, sampling and data collection were conducted later in the research period than would have been favourable. This may have impacted the transferability of the research. The sample size is somewhat small considering the number of citizens who subscribe to Follo Ren's services. I had to pay attention to representing both all three target groups and preferably all four municipalities which the company operates in. With the limited sample size, these criteria were met as well as the time constraints allowed. Alongside the fact that the case study is a unique research setting due to the specific campaign that is under examination, the results of this limited sample can therefore not quite be generalised to the general population of Follo. Neither can they be applied to the general population of Norway, due to the different recycling schemes administered in different regions of the country. Nevertheless, the findings are relevant for Follo Ren and the company's future work on food waste sorting in the region. Further, the results can contribute to a broader understanding of the use of micro-targeting as a measure for distributing information aimed at altering food waste sorting behaviour.

#### *4.7.2 IMPLICATIONS OF THE DATA COLLECTION METHOD*

A few implications associated with the qualitative collection of data are worth noting. As this thesis had an overall objective of providing guidance for the future work of Follo Ren, I defined themes and a theoretical framework prior to the interviews, which guided the formulation of the interview guide and provided a sense of direction in the interviews. Such pre-defined aims can influence the credibility of the research by linking theory and findings from the outset. To avoid this, as little information as was possible was given to respondents regarding theory (as clarified with the NSD) and they were informed that there were no right or wrong answers or behaviours but that the truth as they saw it was the most interesting answer they could provide. As the purpose of the interviews was to attain accurate accounts of experiences, providing them with additional information was not a limiting factor as this helped respondents reflect upon their intentions, attitudes and behaviours. Using in-depth interviews as a method helped reduce the influence on credibility in this case as it allowed for an open conversation about actual behaviours.

#### *4.7.3 ISSUES REGARDING DATA ANALYSIS AND TRANSLATION OF DATA*

Analysing and translating the interviews can also impact results. All but one of the interviews were conducted and transcribed in Norwegian. Information and insight can be lost in translation, so to avoid this as well as to limit time spent on translation, I chose to only translate relevant quotes that were used in the thesis. Such quotes, accompanied by thick descriptions of the contexts referred to, helped ensure confirmability throughout the analysis of results. Using translated accounts could limit transferability and dependability. To ensure these criteria, I kept the transcripts in their original language and coded based on these.

#### *4.7.4 POSSIBLE BIASES*

Although research free of bias and the influence of values is preferable, it is difficult to ensure and it is a real concern relevant to this research. First of all, concerns regarding the validity of the qualitative data emerged due to my connection both to Follo Ren and to the case setting. Being from the area myself, the sampling process consisted of utilizing my personal network as well as the network of the employees at Follo Ren. With concerns of the influence a personal connection to me or other actors with connections to the waste collection company, I attempted to use personal networks as a springboard for respondent recruitment. This led to most of the respondents knowing ‘of me’ through their connection to a friend or family member. Experience from the interviews showed that this did not appear to affect the truthfulness of their responses. On the contrary, most respondents were forward about their ineffectiveness and other sorting behaviours, knowing that my intentions as an interviewer were to gather accurate accounts of the situation in order to help improve the system. Further, the connection between us made the interview setting more comfortable for both parties.

A further issue worth considering is confirmation bias, specifically the influence that my own passion surrounding waste sorting could have on my interpretation of the data. As the research topic and purpose were transparent for the interviewee, this was not much of a concern during interviews and in some cases rather brought forth valuable reflections from the interviewees. Prior to data collection, I tested the interview guide on three acquaintances, one representing each target group, whose academic objectivity and knowledge provided me with good feedback on how I conducted the interview.

## 5. THE INFORMATION CAMPAIGN: “SEPARATE SORTING OF FOOD WASTE”

### – TARGET GROUP ADAPTED

In this chapter I describe the information campaign administered by Follo Ren in the autumn of 2021, the impact of which I examine in this thesis. As I return to, Follo Ren has already performed some basic evaluations of the campaign. The examination performed through this thesis project will provide details concerning the experience of the target groups, and will discuss the use of increased, target-group-specific information. In other words, I will examine whether the campaign’s specific design, based on recent research and recommendation, is a productive approach to combating incorrect food waste sorting, or whether there are other concerns or barriers which ought to be prioritised. I will begin the chapter with a short introduction to the relevant framework conditions and previous research on the topic and how the campaign came to fruition. Then I will describe the campaign in detail, followed by a summary of the evaluations done by Follo Ren. I will end the chapter with a note on data and the possible effects of the COVID-19 pandemic on waste composition over the past two years.

#### 5.1 INTRODUCTION

The waste industry has recently been given the responsibility of contributing to ‘saving the world’ (Løseth & Viki, 2020). When asking people on the streets of Norway what they do for the environment you will be met with myriad answers about waste sorting. Despite the general awareness of the environmental importance of sorting, waste composition analyses show that there is large potential for improving sorting (Onstad, 2021). Although waste management companies have provided information about the importance of waste sorting for several years, this potential has not been met. The EU’s regulation that food waste is to be collected separately by 2023 and the resulting implementation in 70 percent of Norwegian municipalities has led to an increased informational focus on food waste sorting. Yet approximately half of food waste still ends up in residual waste bins even when separate food waste sorting is an available option. Informational approaches have been creative and varied as a response to this low effect. Websites, campaigns and social media are diligently used, as well as common information from industry organisations (e.g., Avfall Norge, n.d.). The increased focus on the need for waste sorting has resulted in the creation of companies dedicated to sharing information in an easy and accessible way, such as Sortere (n.d.) and the Instagram account *Kildesortering i Oslo* [Waste sorting in Oslo] (n.d.), as well as advertisement campaigns using famous actors to deliver the message in a noticeable way (e.g., Grønt Punkt Norge, 2016). Municipal waste



management companies have gained an upsurge of trust from citizens recently, largely as a result of the focus on sustainability and the importance of safely handling our waste. Their communication role has expanded from merely providing details of collection dates to becoming information banks about sustainability measures and the use of waste sorting and recycling. At the same time, it is worth mentioning that there are factors which limit the trust in the waste industry, such as the case about plastic recycling published by the newspaper *Aftenposten* in 2019 (Mathismoen, 2019). This case looked into recycling rates of plastic and found substantial room for improvement in the industry. One detail they pointed to was how a lot of the plastic waste collected in Norwegian households is transported to Germany, where it is incinerated due to being of low quality. The issue with such cases is how the simplified version removes the nuances and presents a black or white scenario that readers without knowledge of all the processes of the waste industry often take at face value. Such cases then sustain social myths about the waste industry, feeding the idea that sorting is pointless (Løseth & Viki, 2020). While national campaigns have addressed such myths through the use of famous people such as Atle Antonsen telling citizens to “pull yourself together”, the myths live on (Grønt Punkt Norge, 2016).

Such informational measures have often targeted single actions, such as rinsing plastic packaging in preparation for recycling in Oslo as in the “pull yourself together”-campaign. The idea is to convey a relatable situation to catch people’s attention before telling them how to perform the behaviour (P. Jensen, personal communication, 28<sup>th</sup> March 2022). It’s about pointing the finger at people’s behaviour without being condescending. Follo Ren had planned to design a campaign that addressed what was referred to as “the bag problem” [poseproblemet], which concerns the overall goal of decreasing the amount of food waste sorted incorrectly into residual waste bags. With the knowledge that the variety of information provided to consumers in Norway has provided ambiguous results, P. Jensen (previously Løseth) decided to utilize the utility of the planned campaign by expanding it using the campaign design from a research project by Løseth and Viki (2020). Based on two previous studies performed in collaboration with the waste management company in Oslo, Oslo Renovasjonsetaten, the campaign design focuses on micro-targeting (Mikkelborg, 2017; Fagernæs, 2018; Løseth & Viki, 2020). Micro-targeting is concerned with conveying information specifically to a target group in a relevant manner with the intention of grabbing their attention. From this, Follo Ren wished to design a campaign that targeted and reached

specific groups of the population identified as less efficient at sorting food waste into the designated green waste bags.

The studies performed by Mikkelborg (2017) and Fagernæs (2018) in collaboration with Oslo Renovasjonsetaten aimed at increasing knowledge about which demographic groups are less efficient at waste sorting, what their socio-psychological characteristics are, which measures are needed to increase their participation in the recycling scheme, and how to implement such measures. One conclusion was that differentiating the message about recycling to target groups who are poor recyclers was necessary. The paper by Løseth and Viki (2020) built upon the specific recommendation made by Fagernæs (2018) to develop a propositional information campaign that would increase food waste sorting among young men living in apartments with shared waste collection bins. This group was delineated from Mikkelborg's (2017) study where young males were identified as less efficient at sorting than other age groups and their female peers, and sub-districts with more block apartments produced lower sorting degrees than sub-districts characterised by detached and semi-detached housing. Løseth and Viki's (2020) research project takes these findings further and discusses how to convey information in a way that reaches the target group. The information that a waste sorting company distributes rarely reaches or is registered by specific target groups, including young men. Using micro-targeting as a strategy, their propositional information campaign thus focuses on conveying information through target group-relevant media channels in a relatable manner.

Through her position as communication manager for a waste sorting company, Follo Ren, P. Jensen was able to test the propositional information campaign empirically, resulting in the implementation of the information campaign in the autumn of 2021. The campaign is described in detail below. Using knowledge gained through yearly customer satisfaction surveys and other forms of feedback, P. Jensen discovered that the issues surrounding food waste sorting were rather universal in Follo, but that different groups of the population had different reasoning behind the experienced issues (P. Jensen, personal communication, 28<sup>th</sup> March 2022). The issues relate to time constraints, lack of information, low amounts of food waste and lack of equipment. Two further groups of the population were identified, which, together with young men aged 20-29, encompass a majority of the residents in Follo. These will also be detailed below.

## 5.2 THE CAMPAIGN

The information campaign was administered by Follo Ren in the period 01.09.21 to 31.10.21. It then continued in the spring of 2022 with increased frequency of messages as a nudging-campaign in order to extend the utility of the campaign (P. Jensen, personal communication, 28<sup>th</sup> March 2022). Overall, the campaign aimed at increasing the amount of food waste sorted into green bags, as opposed to residual waste bags. This aim is anchored in Follo Ren's main communication strategy target #2: "Change our citizens' habits by working with attitude-creating actions within waste reduction, and increased materials recycling through correct usage of the waste disposal system" (own translation). Adapted from the project paper by Løseth and Viki (2020), the campaign's design is based in the communication-oriented strategy of Follo Ren. The point is to tailor the information through relevant mediums, in a relatable manner, befitting the target group's 'modus'. A prerequisite for tailored information is knowledge about the target group's knowledge and susceptibility. A pre-campaign analysis performed by Mannheimer (2021) determined that each target group experienced barriers decreasing their perceived ability to prioritise sorting their food waste. They recommended shifting the focus away from the environmental benefits of food waste sorting and onto depicting the ease of sorting through relatable scenarios. Environment may not be the most important incentive for waste sorting. For most individuals, waste sorting needs to be a simple routine that requires minimal effort (Mannheimer, 2021). Simplifying and rendering the message harmless is the main priority as this will limit the amount of perceived barriers among individuals. The concept proposed is thus *"It's easier than you think"*.

### 5.2.1 CAMPAIGN DESIGN

With the aim of providing the target groups with the information they expressed a need for, the campaign was composed of several elements. Firstly, Follo Ren provides information to its customers continuously through a variety of mediums. This information was available while the campaign ran and consists of: information on the website; an advertisement video at the local cinema shown to approximately 100 000 viewers during the campaign period; and the information magazine 'InfoMagasinet' delivered to all post boxes in Follo.

The first element of the campaign addressed the initial purpose of the campaign, namely the lack of green bags as expressed by customers in the 2020 customer satisfaction survey (P. Jensen, personal communication, 28<sup>th</sup> March 2022). Targeting all citizens, it involved delivering two rolls of the green food waste bags to the doorstep of every household, followed

by an edition of the information magazine which included details of how and why to sort food waste as well as how to access new rolls. Prior to delivery, Follo Ren advertised the occurrence in the local newspapers and sent a text message to all households about the delivery.

The second and main element of the campaign is the target-group adapted advertisement videos. These were administered in two varieties, one short version that lasted 6 seconds, and one long version lasting 15 seconds. To illustrate their use, on YouTube you are exposed to advertisements both before and during videos (unless you pay for a subscription). Follo Ren's videos were played in such advertisement breaks. The clips lasting 6 second were placed so that you cannot skip them, whilst the 15 second clips were placed so that they could be skipped after 5 seconds. In this way, viewers were exposed to a minimum of 5 seconds of the advertisement.

In addition to these two main elements of the campaign, advertisements were placed in social media, local newspapers and on the webpages of several magazines, such as Hytteliv, Viivilla, KK, etc. The idea behind these advertisements is that every time someone with an IP address in Follo opens a newspaper, they will be exposed to the advertisement. If a reader clicks on the advertisement, they are brought to a designated page on Follo Ren's website. They are first met with the image they saw on the advertisement to sustain the relevance. The rest of the page is then target group adapted, with content based on what information the target group wishes and needs. For instance, young males aged 20-29 are first met with short and simple information, conveyed in a language appropriate to them, followed by more specific information about the importance of sorting, as well as practical information about sorting. By contrast, adults aged 55+ were first told how to get hold of new green bags, an issue they express, before they are educated on the importance of sorting and what to sort where.

In the spring, the campaign was extended as a nudging campaign using programmatic advertising. A continuation of the micro-targeting approach, readers were exposed to target-group-relevant advertisements based on their IP address. Now, the advertisement would be visible not only in local newspapers and some specific magazines online, but also in some large national newspapers, e.g., VG and Aftenposten. One idea behind this kind of exposure is that readers do not expect to see an advertisement from a local company in a national newspaper or magazine and will be intrigued by its placement and thus notice it more often. In combination with posts and advertisements on social media, the amount of exposure to the advertisement would increase. While the message – the videos – was conveyed in the autumn, citizens are

now being constantly reminded of the simplicity of sorting food waste whenever they visit an online magazine or newspaper (P. Jensen, personal communication, 28<sup>th</sup> March 2022).

### 5.3 THE TARGET GROUPS

While the general information available is aimed at all customers, the campaign micro-targeted three groups of the population identified as those in need of additional information concerning food waste sorting. A target group is a selection of actors segmented based on a set of criteria, often demographic characteristics, psychography or behaviour (Brønn et al., 2015 in Løseth and Viki, 2020, p. 20). The groups deemed relevant to target were initially identified by P. Jensen through trends in customer feedback and through the recommendations made by Mikkelborg (2017) and Fagernæs (2018). To gain a deeper understanding of the characteristics of the target groups, as well as their informational wants and needs, a pre-campaign analysis was performed by the strategic communication agency (Mannheimer, 2021) on behalf of Follo Ren. After some additional tweaking by P. Jensen (personal communication, 28<sup>th</sup> March 2022), the groups were defined as (1) young males aged 20-29, (2) families with young children and (3) adults aged 55+ without children at home.

Through the pre-campaign, Mannheimer (2021) examined what the different target groups believe is needed in order to incentivise increased sorting of food waste and they tested differentiated messages based on reasons given by each target group for why they do not sort their food waste. This was performed as a form of focus-group interview where respondents from each target group were shown a potential advertisement which they were then asked to deliberate on. Target-group relevant situations were delineated from these deliberations, forming the basis for the advertisement videos. These were delivered through media channels relevant to each target group, with accompanying advertisement sets. The main finding from this pre-campaign analysis was that although the citizens of Follo express a need and wish for information about the environmental benefits of waste sorting, what they in fact want to hear is how quick and easy it is to sort, knowing that Follo Ren will ensure environmentally friendly handling of the waste further down the line (P. Jensen, personal communication, 28<sup>th</sup> March 2022).

The information campaign's main message was:

*All food waste should always go in the green bag. Also on busy days when other things occupy your mind.*

This message was adapted to each target group. The differentiated messages are tailored to reach and be registered by the relevant target group by depicting a relatable situation. The messages follow communication strategies and are short and to the point. It is assumed that the target groups know what the green bags are for and how to use them, they just need reminding. In the following section a description of each target group and the message they received is outlined.

### 5.3.1 YOUNG MALES AGED 20-29

Adapted from the target group analysis which proposed targeting young adults who do not live with their parents, Follo Ren decided to target young males aged 20-29 (P. Jensen, personal communication, 28<sup>th</sup> March 2022). This group is categorised as often living in flat shares or in their own apartments. The target group analysis also described some waste practices common among this group, for instance that they tend to sort plastics and paper but are sloppy with food waste, and that they do not know where or how to get new green bags. The low sorting efforts for all waste types were described as being due to a lack of space in the apartment for the necessary waste bins. In terms of attitudes, they generally express concern about the environment but do not necessarily translate this into action.



Figure 2: Advertisement aimed at young adult males aged 20-29

*Situation:* The gamer – they can all relate to this, whether they are hardcore gamers or only play on rare occasions. This situation is also translatable to watching TV.

*Text:* Do you have full control of your food waste? Use the green bags instead!

*Channel Choice:* social media (SnapChat, YouTube, Instagram) – only film clips

### 5.3.2 FAMILIES WITH YOUNG CHILDREN

This group was described as producing the most waste (Mannheimer, 2021). Having children in the house is described as the deciding factor: children are described as not sorting waste, which results in a feeling of sorting being a ‘waste’ of time and effort for parents. Food, plastics, and even paper, pile up to create a large total amount. This group also expresses a lack of green food waste bags and not everyone knows where or how to get hold of them.



Figure 3: Advertisement aimed at families with young children

*Situation:* A mess after a kid’s birthday party, or a playdate that went overboard. A common situation in a family with children where one cannot be bothered with separating food waste – the aim is to clean up as fast as possible. Food waste could have ended up anywhere but on the plate.

*Text:* Has food waste ended up among the toys? Use green bags instead!

*Channel choice:* Social media (SnapChat, Instagram) + newspaper advertisements (‘native’ ad that shows film)

### 5.3.3 ADULTS AGED 55+ WITHOUT CHILDREN AT HOME

Also adapted somewhat from the target group analysis, which proposed focusing on older people aged 75+, Follo Ren targeted adults aged approximately 55+ without children living at home (from here on simply adults aged 55+). The reason for this delineation is based on the commonly expressed excuse from the older age group of not having ‘enough’ food waste for it to be worth separating. The idea behind moving the age barrier down to 55+ is that children are a factor in the household’s food waste production and sorting behaviour, and when they move out, the amount of food waste is reduced. Members of this group are generally dutiful and have a wish to sort, yet do not always know what to do, even though they are more prone to read the information they receive from Follo Ren than the younger target groups. In general, this target group is characterised by small households with low amounts of food waste who need reminding that they still produce some food waste that should be separately sorted.



Figure 4: Advertisement aimed at adults aged 55+ (first image)



Figure 5: Advertisement aimed at adults aged 55+ (second image)

*Situation:* When communicating with this group, a recurring excuse is that they don't have much food waste. To illustrate this, a fridge containing a single olive that needs to be thrown away is depicted. This is a hyperbolized situation, but most people will understand that they have more food waste than that, and that it thus needs sorting separately.

*Text:* Not much food waste? It still goes in the green bag!

*Channel choice:* Newspaper advertisement ('native' ad that shows film)

#### 5.4 EVALUATION DONE BY FOLLO REN

To evaluate the effect of the campaign, Follo Ren planned a media analysis and a small-scale residual waste analysis. The former consists of a view- and exposure-report from A-media (2021), specifically measuring exposure through the local newspapers digitally, as well as number of exposures in social media. These were utilized to measure the reach of the campaign. In other words, they wanted to know how many citizens were exposed to one of the digital advertisements and nudges during the campaign period. The residual waste analysis was utilized to measure whether there had been an increase in separately sorted food waste compared to two years before. The results from these are summarized below.



#### 5.4.1 MEDIA ANALYSIS

Throughout the period between 03.09.2021 and 25.10.202, the campaign was spread through three local newspapers, as well as through the social media platforms Facebook, Instagram, Snapchat and YouTube. As the nudging campaign is still running, we only have numbers from the campaign period in the autumn to analyse (A-Media, 2021). The campaign had a total reach that met the goals set by Follo (P. Jensen, personal communication, 28<sup>th</sup> March 2022). In terms of demographic reach, the age group accounting for the most views was 45-57, and the most avid clickers were aged 75 and above. The younger age groups were targeted more specifically in social media and with the help of a specialist working specifically on ensuring that each member of the two younger target groups was exposed to the advertisement three times, goals were met. Overall, P. Jensen (personal communication, 28<sup>th</sup> March 2022) is satisfied with the campaign. It was purely a campaign aimed at reminding people of a behaviour. Without any ‘calls to action’ or ‘click here for more information’ statements, the campaign reached a satisfactory number of viewers, according to national averages (P. Jensen, personal communication, 28<sup>th</sup> March 2022).

#### 5.4.2 RESIDUAL WASTE ANALYSIS

The second initial evaluation was conducted in January 2022 and was intended as a simple indicator. A small-scale residual waste analysis was performed, which entailed collecting five 660 litre residual waste bins from two locations. Two housing associations were chosen based on assumptions about the demographic characteristics of the residents, as well as on logistics – they have the same collection day. The first location was an apartment block, with expected residents being adults aged 55+ without children living at home. The second location was a housing association for semi-detached housing, with the common residents being families with young children. The reason why detached houses were exempt from this analysis is that they tend to be better at sorting than those who have shared collection bins (P. Jensen, personal communication, 28<sup>th</sup> March 2022; Mikkeltborg, 2017). Overall, the idea was to gather as broad information as possible on an as small as possible analysis.

The ten bins were separately collected and transported to a transshipment hall where they were to be analysed. Here, they were weighed in full before the waste bags were sorted into two categories: residual waste and food waste. These were then weighed separately to provide data on the amount of food waste in comparison to residual waste. This analysis was an exact replica

of one performed in November 2019, thus providing comparable data. The results show a slight increase of 3 percent in food waste in proportion to residual waste between November 2019 and January 2022. While this slight improvement is a positive indication, it is uncertain whether it is a result of the campaign, or whether there are other influences affecting food waste amounts currently. I will touch upon one such influence below.

#### *5.4.3 THE INFLUENCE OF THE COVID-19 PANDEMIC*

It is worth noting the effect the COVID-19 pandemic could have had on waste generation as people spent more time at home during the months of lock-down. During the first year of the pandemic, Norwegian households produced 6 percent more waste than the previous year, beating the record set in 2014 (Onstad, 2021). Comparatively, the increase in sorted food waste in Follo was 5.8 percent from 2019 to 2020 (Follo Ren, 2021). This is telling when compared to the more moderate 1.5 percent increase from 2018 to 2019 (Onstad, 2021). In terms of waste composition, food waste constituted less of the total amount of waste produced by households in 2020 compared to 2019. This trend turned sometime between 2020 and January 2022 according to the small-scale residual waste analysis, where the percentage of food waste had increased by 1 percent (Follo Ren, 2022). However, a positive trend was shown where slightly less food waste was incorrectly sorted into residual waste (Follo Ren, 2021). These numbers show that there are slight variations occurring in food waste sorting behaviour, but that they are rather minor so far. Although the numbers for 2021 are not yet available, it is safe to assume that the numbers do not differ too much from 2020, as the years resembled each other somewhat in terms of time spent at home with home office and periods of lock-down. What the effects of the COVID-19 pandemic have been on food waste sorting behaviour is unknown, but we can speculate based on the behavioural changes many people experienced following the outbreak of the pandemic in 2020 (Oslo REN, 2021). An increase in home office could cause an increase in waste produced in the household as opposed to at the workplace or in public places. This can also have led to an increase in the amount of non-edible food waste as more food is prepared at home, instead of being consumed already prepared by a restaurant or similar. A disadvantage I met upon with the deadline for this thesis being in May 2022, is that the national waste composition report for 2021 will not be published before June 2022 at the earliest. While these numbers would have been relevant and interesting to include, they do not limit the validity of this qualitative study.

## 5.5 SUMMARY

The target-group adapted campaign aimed to remind the citizens of Follo of the possibility to sort their food waste separately to prepare it for recycling. By identifying the groups of the population who tend to participate less in this behaviour, the campaign sought to not only remind them of the action, but also to depict how easy and effortless it can be in a relatable manner. With the aim of fostering a habit among the population, Follo Ren has created an information campaign that focuses on relating to the cognitive dimensions of individual responses through reminding them about how to easily sort their food waste, while simultaneously providing accessible knowledge about the hows and whys of food waste sorting on target-group adapted webpages.

The evaluations performed by Follo Ren provide a basis on which to examine the impact of the campaign, which is the intention of the first objective of this thesis. The residual waste analysis gives a positive indication of an increase in separately sorted food waste and the media analysis tells us that a significant amount of people in Follo were exposed to one of the advertisements more than once during the campaign period. However, exposure does not correlate to attention, so while these evaluations serve as an indication of the reach and behavioural effect of the campaign, a deeper examination is needed of whether the viewers noticed the advertisements, whether they were then affected by the message, and whether they then intended to alter their food waste sorting behaviour. In other words, to understand whether the message actually registered with viewers, and whether it then influenced their intentions and behaviour, a further study is necessary. This will be done through the analysis of the responses gathered through the qualitative interviews in chapter 6.2.

## 6. ANALYSIS AND DISCUSSION

This chapter presents the analysis of the qualitative data. It is organized according to the research questions and is divided into 3 parts: (i) a description of why food waste ends up in the residual waste bin in Follo; (ii) an examination of the experiences and impacts of the differentiated information campaign; and (iii) a discussion of future endeavours that could increase participation in separate food waste sorting in Follo.

### 6.1 WHY FOOD WASTE ENDS UP IN THE RESIDUAL WASTE BIN IN FOLLO

To understand why food waste ends up in residual waste, I needed to identify barriers that respondents perceive and experience (research question 1) and then establish how these barriers influence sorting motivation and behaviour (research question 2). This section includes the findings and analysis for both research questions 1 and 2 as they are interconnected. Understanding the context within which the campaign was run will help guide the examination of the campaign's impacts in section 6.2 (research question 3). Although Follo Ren requested an examination of physical barriers specifically, respondents were asked about barriers in general to provide a more comprehensive overview of the inhibiting situational factors in Follo. This is also because situational barriers are dependent on and influenced by individuals' perceptions, motivations and personal traits, most likely more so than the physical infrastructure (Miafodzyeva & Brandt, 2013). This section is divided into three categories relating to the explanatory variable they correspond to.

#### 6.1.1 TECHNICAL-ORGANIZATIONAL BARRIERS

Firstly, as predicted by Follo Ren, respondents brought up some issues that can be categorized as physical, or technical-organizational, barriers. These can be summarized as (i) lack of space for equipment, (ii) mixed wastes and packaging, and (iii) unsuitable size of food waste bag. In this section, I will begin by reflecting on the level of satisfaction with the food waste sorting scheme as expressed by respondents and discuss whether the system is designed and organized in such a way that it facilitates separate food waste sorting in a convenient manner. This will introduce the context within which further technical-organizational barriers are experienced.

The main prerequisite for sorting to occur is that the system facilitates it, and that people are aware that they should sort. Of the 19 respondents, all are aware of the possibility to sort food waste separately and generally express satisfaction with the various elements of the sorting scheme in Follo. In general, respondents report being satisfied with how the system is

physically designed and organized for food waste sorting: “It fits right under the sink just beside the residual waste bin. It’s very convenient”. Another respondent’s answer describes well that the system creates convenience: “I mean, when there’s a scheme for it [I sort]. When we got the green bags, I did it, and I still do, pretty consistently”. If the system had not facilitated the separation of food waste through the provision of bins and bags, people would not sort food waste separately, exemplifying how the system facilitates the desired behaviour when implemented.

A potential barrier was suggested by Follo Ren which is useful for testing whether there exists a biased perception of sorting-related disadvantages (Lange et al., 2014; P. Jensen, personal communication, 24<sup>th</sup> February 2022). This potential barrier has been a concern in other settings and was tested through the interviews. It concerns the perception of distance to the waste collection bin and its general convenience and relates to whether individuals experience an increased perception of effort from having to walk a certain distance to discard of their wastes as well as whether the waste collection bins themselves are a source of dissatisfaction. No respondents indicated that the distance to the waste collection bin was a barrier. In fact, when directly asked about this, respondents expressed that the waste collection bin was placed in a very convenient manner. Some respondents even went so far as to say that in situations when the perceived effort of taking out the food waste bag was high, they simply chose to store the bag in the hallway until it was convenient to take it to the bin. This indicates that the collection system is well adapted to account for accessibility and convenience.

In terms of negative aspects concerning the collection bin, a few respondents indicated that, in the summer, the smell from food waste bags in the collection bin could be an issue, either for them or for neighbours whose houses are situated closer to shared collection bins. Additionally, there was some expressed dissatisfaction with collection frequency during periods when there is an increase in waste, such as at Christmas time. However, this did not seem to influence sorting behaviour. One explanation for this is that food waste will end up in the collection bin regardless of it being in a green food waste bag or in a residual waste bag. What this suggests is that the organization of the food waste sorting scheme fulfils the prerequisite for sorting by facilitating the behaviour, but, as I will return to, there are other physical aspects and situational factors that influence or constrain behaviours.

Firstly, though, the overall general satisfaction with the sorting scheme in Follo indicates that Follo Ren is a competent municipal waste management company that understands its citizens well. It suggests that the company has moved beyond the assumption that persuading citizens to change their behaviour to fit the system is fruitful. Follo Ren now acknowledges the importance of situational variables and how they intertwine with motivational factors, subsequently influencing behaviour, and makes changes to services accordingly (Timlett & Williams, 2011). The increased focus on behavioural issues and the use of feedback to identify barriers to participation and increase satisfaction with the sorting scheme shows that the company has taken a turn toward a more fruitful approach. Follo Ren's aim to facilitate intuitive and easy household waste sorting both physically and with the aid of good customer service reflects the company's mission to accommodate for more sustainable household waste management behaviours (Follo Ren, 2018). Indeed, Follo Ren acts as an institution through which certain attitudes and values are promoted, and the system that has been implemented prescribes pro-environmental behaviour (Vatn, 2015). By opting to use pedagogic policy instruments, Follo Ren has ensured high potential legitimacy, which legitimizes such prescription of behaviour. The normative power they exert is normatively and cognitively legitimate through this choice, which is reflected in the overall general satisfaction and trust attributed to the company (Follo Ren, 2021). Through focusing on providing services that are the best for its citizens, the company identifies and removes barriers experienced by the citizens of Follo, continuously improving the system economically and sustainably, while retaining citizens' best interest (Follo Ren, 2018). In the yearly customer satisfaction surveys as well as in this thesis, respondents suggest that the sorting scheme is well organized and intuitive, suggesting high legitimacy. This is both a result of and proof of Follo Ren's understanding of its customers. Yet, as the following suggests, there is always room for improvement.

The most prominent physical barriers expressed by respondents concern lack of space for the food waste bin in the kitchen or lack of the food waste bin itself. The four respondents with this issue explained and responded to this barrier in different ways. For two, the lack of the food waste bin comprises the main barrier. Respondent 3.5 (see Table 1 for description of respondents) reports that it is a combination of lack of space and the effort required, whilst 1.1 explains that if they had the food waste bin and/or bags, they would be more likely to sort. This latter reasoning indicates an intention to sort that is barred by a physical barrier: "I sort if I have the food waste bags, but now that I don't, everything goes in the same bag". They explain that their small kitchen does not have room for actual bins to place the waste bags in and has opted

to hang their residual waste bag on a cupboard door as a solution. For this respondent, the lack of space in their kitchen cupboards and lack of installed equipment that facilitates sorting has caused them to down-prioritize waste sorting.

Respondent 3.5 explains that although they and their husband began sorting food waste when it was implemented in 2017, they quickly resorted back to sorting the ‘old’ way out of habit. The new system required too much effort, a perception that was exacerbated by the lack of space for the food waste bin in their kitchen: “We have all the washing equipment there [in the cupboards under the sink] and it takes up so much room. There is the food waste bag, but it’s so easy to just throw it [in the residual waste]”. This respondent only sorts out of convenience and reports only sorting two waste categories separately from residual waste: paper and bulky waste. Both are separated because they take up too much space in the residual waste and because the collection system explicitly suggests their separation. Further, separate waste sorting is experienced as time-consuming and somewhat of a nuisance in their busy everyday life: “I think it’s difficult to convert those who are used to just throwing everything [in the same bin]. That the days are so hectic. It’s, I mean, it’s just to open the bag and throw the food waste in there”. They reflect that if they had a kitchen that facilitates separation of wastes, they might be more likely to participate in the scheme as it would require much less effort from them as individuals:

In newer houses where they have a good system, it’s lined up. For those who have that it’s a given. We don’t have so much space, so I feel like I have to structure it so much. So I don’t prioritize that little thing.

What this experience suggests is that the physical barrier leads to the respondent experiencing several motivational and situational barriers, which exacerbate each other.

Respondent 1.5, a newcomer, was not aware that sorting food waste was an option that applied to them prior to the interview. Although they were aware of the option to sort food waste in Follo and had the green bags, they were under the impression that it was an alternative sorting option for those who had chosen to and who then had a separate collection bin for food waste. This impression may stem from two things. Firstly, they lack the food waste bin for their kitchen, and secondly, they used to sort food waste in a previous home in another municipality where food waste was disposed of in a separate collection bin: “I mean, I just assumed that the green bags go in their own collection bin since we have ones for paper and residual waste”. This assumption occurred because they did not personally receive information about the sorting

system when they moved to Follo, suggesting a situational barrier concerning knowledge and information (which will be discussed in section 6.1.2). The respondent does, however, reflect that the person they own the house with might have received the necessary information and forgotten to share with the respondent. During the interview, they expressed high intentions of beginning to sort food waste after their kitchen has been renovated and would include facilities that simplified sorting of several waste types, which indicates that convenience is desired and an experienced necessity. By contrast, another respondent sorts their food waste separately despite lack of a convenient space for the bin in their kitchen. They have placed the bin on a chair to make it accessible. The difference between this respondent and the other three who express a lack of space is that separate food waste sorting was already an established habit for them and they were thus not personally barred from acting on their intentions by lacking the food waste bin.

A recurring barrier expressed by most respondents concerns the packaging that food comes in. Even respondents who report a very high degree of correct sorting admit that they occasionally throw food waste into the residual waste bag when it is inside packaging. To a varying degree of frequency, respondents find out-of-date foods wrapped in packaging that they discard of due to hygienic reasons, as exemplified by respondent 2.1:

What potentially can happen is that if a packed lunch has been forgotten and left in a bag for a week, it might go in the residual waste bin. Or a half-full milk-carton after a school trip forgotten in the school bag. Those are probably the two things that cause food waste to end up in the residual waste. But having said that, it's rare. It only happens on those very rare occasions where we don't tidy out the school bags in due time.

Among the less punctilious sorters, unrinsed packaging is also reported as a reason for why food waste ends up in the residual waste. Some expressed examples are the plastic bags salad comes in, the metal tin from mackerel in tomato sauce, the bread bag with a mouldy or dry crust at the bottom, a jar of salsa that has gone mouldy, and an unopened but out-of-date meat package. One respondent highlights how difficult packaging that food for young children comes in is to rinse: "not everything, especially products for children, not all of that is especially easy to clean. Squeeze-bags and such". Similarly, forgotten packed lunches are reported to be a culprit, as the quote above suggests. Such issues result in mixed wastes ending up in the residual waste bin. In these situations, respondents experience needing to increase



their effort to sort correctly. This can create a barrier, especially if combined with being pressed for time:

It's about how it has to be clean, and you need to have rinsed and then dried it on the bench and all the instructions that follow. You can't just put it in [the bin]. Then it's more time-consuming. But then we're talking about, you know, if you have a crust and you've tied the bread bag. We're not talking large quantities.

Further, experiencing a physical barrier, such as how packaging does not facilitate easy sorting, repeatedly, can cause individuals to feel like they are unfairly obliged to exert effort to reduce a problem that they believe is someone else's responsibility. In other words, they find it demotivating that they as individuals are responsible for separating mixed packaging that should be avoided at the producing end, such as when paper and plastic are fused together. This is exacerbated when the packaging includes foods that are more difficult to remove through cleaning. A further reported happenstance is when, after meals, a plate contains both leftover food and paper napkins. These combinations of wastes are then discarded in the residual waste.

The last physical issue expressed concerns the size of the food waste bags and bins. While a few respondents reported dissatisfaction with the size of the bags, it did not constitute a barrier for more than two respondents. These two respondents both have little food waste and either opt out or used to opt out because they did not experience sorting their food waste into the bags provided as intuitive. Both respondents explain that it feels like a waste of plastic when they produce so little food waste and have to discard of a half-full bag due to the smell. While respondent 3.1 has opted to not sort their food waste separately, respondent 3.6 explains that they used to not sort their food waste but have begun participating in the scheme again now. They bring up how this is a topic between them and a friend in the same life-situation who chooses to opt out of sorting. What bars participation is the smell that food waste produces after a few days as well as the perceived effort required for such small quantities and the frequency with which they need to change the bag due to smell. These barriers are then enhanced by the feeling of dissonance when sorting into plastic bags which they dispose of half-full: "what I worry the most about is not filling the bags, and then there's so much plastic. And then it's like, is it worth it. No, it's not exactly environmentally friendly then".

Another concern raised regarding the size of the bags relates to the other end of the scale. For respondents from families with young children, the amount of food waste resulted in the need to discard of the food waste bag at least once a day. They requested a consideration of supplying

larger food waste bins and bags for families with this issue. However, they also reflected on how that would be in dissonance with the aim of reducing food waste. A further issue relates to the fit of the bags in other food waste bins than those provided by Follo Ren. A lot of newer kitchens have a waste sorting system integrated into the kitchen cabinets. These solutions vary, depending on the producer and tend to have compartments that are somewhat larger than the bins the food waste bags from Follo Ren are intended for. Although respondents expressed this concern, none experienced it as a barrier and all had found solutions to the problem.

In sum, the physical infrastructure does have an influence on food waste sorting participation. Those who have the facilities report that it is a good system that is fairly intuitive and convenient. The barriers experienced by respondents are: (i) lack of space for the food waste sorting equipment; (ii) food waste packaging and mixed wastes; and (iii) unsuitable sizes of food waste bags. A recurring theme when analysing these physical barriers was how they intertwine with motivational and situational barriers and become exacerbated issues, leading to a lack of willingness to separate sorting in certain situations. The higher the perception of inconvenience caused by lacking or ill-fitting equipment, the stronger the influence of other barriers is. The combinations of perceived barriers then lower intentions and willingness to exert individual effort, leading to situations where food waste ends up in the residual waste bin. I will return to how Follo Ren can approach these issues in section 6.3.

#### *6.1.2 SOCIO-PSYCHOLOGICAL BARRIERS*

The physical barriers were not experienced as occurring in a vacuum. Respondents reasoned about what caused them to sort food waste into the residual waste bin. These reasons can be categorized as either motivational or situational factors. The motivational variables that emerged relate to social influence and respondents' environmental concerns, while the situational variables present can be summarized as information and knowledge, effort, habit and hygiene. Habit here coincides with what Miafodzyeva and Brandt (2013) term 'past behaviour'.

Firstly, social influence emerged as an explanation for why some respondents do not sort. Two of the young adult males report that their roommates are bad at sorting their waste in general and this influences their own willingness to participate in the sorting scheme. This does not only apply to food waste but also to other waste types:

There's no point in me sorting paper if nobody else does it, you know. So you're like, oh this is paper but the others have put something else in the paper waste, so there's no point in me doing it.

This respondent goes on to reflect that he would probably be influenced in the other direction, towards sorting, if that was the social norm in the household. A recurring theme from respondents who live with other people was that they blamed other household members for sorting food waste incorrectly or for causing food waste to end up being sorted incorrectly. However, most do not report this influencing their own sorting efforts.

A second motivational factor concerns the influence of the global environmental issue on behaviour. Most respondents sort because they believe it to be an environmentally beneficial individual act, while others participate mostly due to a sense of duty. However, some respondents report that they are sceptical to the importance of household waste sorting and explain that they are more concerned with the waste from supermarkets, or on a larger scale, the problem of big industries polluting:

I don't think I can change the world by throwing eggshells in the correct bin when I know how things are in industry and in agriculture, and not least in China and the U.S. Then I see how insignificant Norway's population is.

Another respondent reflects this view: "On a worldwide basis, I feel like it's difficult to keep my motivation high because I feel like it's like peeing in the ocean when you look at what factories are spewing out in developing countries". For them, this becomes an excuse that justifies their sorting behaviour when they opt out of sorting their food waste separately. It instils a feeling of powerlessness when they observe the many issues that need to be dealt with and the amount of effort it requires from them as individuals.

Concerning situational variables, information and knowledge were important variables to study in this thesis based on the objective of examining the impacts of the information campaign. While I will go into more detail on the campaign in section 6.3, there are some responses worth noting here. One respondent experienced a lack of knowledge about what food waste is. This relates to how they find the barriers between waste categories somewhat unclear. One example is that they were unsure whether tobacco products belonged in the food waste or not. A more important issue concerns how the three respondents who recently moved to the region do not remember receiving information about how to use the sorting facilities when they first moved

there. One of these respondents sought out the knowledge on their own, one began sorting in the autumn of 2021 due to the delivery of food waste bags on their doorstep, and one did not learn about the option before being recruited for the interview. All of these three had an initial knowledge-deficit that hindered their participation in the scheme.

A second situational variable concerns habits and past behaviour. Past behaviour emerged as an important explanatory factor for current habits. Several respondents reflected on how the sorting system they grew up with created a habit they have brought with them into the new sorting system. This relates especially to how several respondents have composted their household food waste in the past or lived in a region where food waste sorting was implemented before 2017: “I come from a family which has always sorted food waste. We had a compost bin in the garden. So it was very weird for me to not sort food waste”. They explain that this experience with separately sorting food waste made it easier to adopt this behaviour when it was implemented in 2017. Two respondents currently compost, where one uses both their composting system and the food waste bags provided by Follo Ren. They explain that this is because there are some types of food waste they want to avoid ending up in the garden. The other composting respondent has used a compost for more than 30 years and has perfected this behaviour, reporting that they never discard of food waste in the residual waste. The benefit of composting is that it has a similar system indoors as the food waste sorting scheme from Follo Ren. Both composters explain that they have a smaller bucket in the kitchen which their daily food waste goes into. By contrast, respondent 3.5 explains that their previous sorting habits prior to the introduction of food waste was hard to break and led them to resorting to these old habits, meaning they do not sort food waste now.

Possibly the most prominent explanations for why food waste is sorted into the residual waste bin relate to perceptions of effort. Each respondent who reports either often or occasionally sorting food waste incorrectly explains it as an act of laziness. Some of these respondents express a feeling of guilt when being lazy but explain that occasionally they are short of time or have other, more pressing issues to deal with that lead them to minimizing the effort they spend sorting their waste. Among the most dutiful respondents, being pressed for time seems to be the most important factor: “It’s mainly if I am either pressed for time or have had a long, tiresome day. If there’s a little bit of salad left in the bag I won’t necessarily be bothered even though I should”. In general, their perception of effort is lower than for those who do not sort or are more influenced by barriers such as smell and packaging. In fact, some of the most

dutiful respondents react to how others perceive waste sorting as time-consuming and demanding:

I've got to say – as a citizen, it surprises me to hear that, like, people use an argument of it being difficult, or cumbersome. Because it isn't. No, it isn't. And it's just, I'm surprised at that. I'm surprised that it's a thing. Had it been plastic, I would have understood it. Well, because plastic is in everything.

Respondent 2.7 touches upon the effort other wastes require and how that can affect their sorting: "It's a bit more time-consuming. But then we're talking about, you know, a crust and you've tied the bread bag, so it all goes in the same bin".

Relating to this, some respondents are barred more heavily by the perceived effort required to sort. Respondent 3.5 explains that they do not sort simply because it requires too much effort. They refer to it as an added obligation and a burden and explain that it is simply easier to put it all in the same place. Respondents 1.1. and 1.5 agree on the perception of effort but reflect that it has much to do with laziness. In a similar manner, respondents 2.6 and 3.1 report that they have observed their spouses putting food waste in the residual waste bin. This tends to be in situations where they have several types of waste to discard of simultaneously. Both respondents reflect on this behaviour and deem it an act of laziness: "I think it's about taking the trouble. I think it's about: one shove into the bin – done". Several respondents report a similar behaviour: when either the food waste bag is full and tied up ready to be taken out or the residual waste bag is just about full, it is easy to just sort potential food waste into the residual waste. This is to avoid the effort of getting out a new food waste bag or to simply get food waste out of the way when the residual waste is about to be taken out anyway:

If I'm already going to take out the residual waste, you know, then that bag is almost full. And then I've eaten some fish or chicken for instance, then I've put it in [the residual waste], and then gone out with that bag so that I'm rid of it instantly without using a whole [food waste] bag.

In sum, effort is a recurring explanation of why respondents do not always sort their food waste correctly. It is very often related to packaging and mixed wastes, even for the most dutiful respondents.

A third situational factor concerns hygiene. This factor emerged as a recurring explanation of why food waste was sorted into residual waste. The first hygienic factor concerns the smell that

the food waste bin produces. Respondents 1.3, 1.6 and 3.6 explain that they have very little food waste and that filling a food waste bag can take several days, causing the discarded food to rot and begin to smell. This has led to 1.3 opting out of sorting. They explain that if they discard of everything in the same bag, less time occurs before they have to take out the residual waste bag. 3.6 used to abide by this logic but has taken up sorting again recently as not sorting did not resonate with her values. The second hygienic factor concerns out-of-date food. While this relates to packaging as discussed above, the action is heavily influenced by the hygienic aspects surrounding mould and unappealing foods. In terms of mould and out-of-date products, respondents report being concerned about their health and choose not to open packaging with mouldy products inside. Subsequently, the mixed waste ends up in the residual waste. This seems to happen regardless of type of packaging, resulting in plastic, glass and metal containing food waste ending up in the residual waste. Even the most dutiful respondents who report rinsing all their packaging admit that this is an action they occasionally perform. This behaviour reflects an attitude of “out of sight, out of mind” as respondent 3.1 expresses: “It’s the same with a bit of cucumber stuck in the plastic and I’ve been making a salad for instance so like, now I can’t throw it there [in the food waste] so...”.

### *6.1.3 STUDY-SPECIFIC VARIABLES*

While no study-specific trends emerged that are worth discussing, there is one instance I wish to reflect on. One respondent, a recent immigrant to Norway, expressed issues reflecting those found by Mikkelborg (2017) among non-ethnic Norwegians in Oslo. This respondent explained how the lack of information and the language barrier were a major hindrance to both them and their roommates when they first arrived in Norway:

The collective that I lived in, it’s an international collective, and you might have students that come from different countries where it might not be a very common practice to do or might have a different sorting system. I think then it would have been a little nice to have got a heads up about how to do it or what it is about. I think all the information that I had was just asking around.

While the respondent themselves had high intentions to sort and sought out information in order to act on those intentions, this may not be the case for everyone. As the respondent points out, some international students may have sorted differently in their home country or not be familiar with sorting wastes at all and will need educating about the system in Follo if they are to participate. The respondent suggests both having informational meetings at the beginning of

each term as well as providing each collective with posters that describe the system and what waste goes where. Past behaviour from different sorting systems may lead to feelings of uncertainty regarding what should go where and whether packaging needs to be rinsed or not. Such details need to be conveyed in a simple and accessible manner:

Maybe simple understanding, or maybe someone who could tell us that, ‘ok, this is how the systems is and this is what we do and this is how we expect it’. I think that would have been easy. Maybe it is accessible. Maybe it is, but I didn’t find it accessible when I moved here.

Further, to overcome the language barrier, this information ought to be conveyed in English so as to not exclude international students. The respondent’s experience was that other international students in the collective who were unaware of the system in Follo did not participate until the respondent decided to facilitate the sorting and tell their roommates about it: “people who don’t know, I think many of them don’t bother about it. They just put everything together and throw it away so”.

In sum, there are several motivational and situational factors that can explain waste sorting behaviour in Follo. Responses suggest that there is a lack of a social norm among certain groups of the population. The scale of environmental issues causes environmental numbness in some participants, acting as a barrier to participation in moments of uncertainty or laziness. These motivational issues intertwine with perceptions of effort, lack of knowledge, concerns about hygiene and old habits, creating a context in which individuals to varying degrees of frequency end up discarding of their food waste in the residual waste bin. How these barriers can be handled will be discussed in section 6.3, but first: an examination of whether the various elements of the information campaign were appropriate approaches to eliminating the identified barriers.

## 6.2 WAS THE DIFFERENTIATED INFORMATION CAMPAIGN AN APPROPRIATE APPROACH TO COMBATING LOW FOOD WASTE SORTING IN FOLLO?

In this section, I examine the impacts of the campaign using the data provided by Follo Ren and discuss it in comparison to the findings from the interviews which relate to the different aspects of the campaign. This will be done by first by discussing whether using differentiated information was an appropriate approach in the given context and then by considering the experiences of respondents and discussing whether the campaign fulfilled its goals. As

described in chapter 5.4, Follo Ren's preliminary evaluations of the campaign indicate a positive effect of the campaign. This section does not intend to either confirm or refute the validity of these evaluations. The substance of the examination performed here is minimal as the responses of 19 individuals cannot account for the experiences of the entire population of Follo. Instead, their responses are useful for discussing what Follo Ren can do to *increase* the effectiveness of their chosen policy instrument.

### 6.2.1 INFORMATION AS A POLICY INSTRUMENT

The information campaign was based on some preliminary, experience- and feedback-based assumptions about why citizens of Follo sort food waste into the residual waste bin. Originally, Follo Ren intended to target a single physical barrier as expressed by citizens, namely that they lack the appropriate green food waste bags. The company assumed that citizens needed to be reminded of how to access these bags and additionally hoped that the provision of bags to each household would kickstart households who do not yet sort food waste separately to begin participating in the scheme. As such, Follo Ren assumed a knowledge deficit among the general population. In the pre-campaign target group analysis, three specific groups were categorized as lacking this knowledge about how to access new food waste bags. Using information to increase this knowledge was an appropriate choice. After all, without the necessary knowledge, individuals will not know how to participate. In other words, if individuals do not know how to access the food waste bags, they are barred from participation. Further, the company provided additional information concerning why food waste should be sorted on target-group adapted webpages. This relates to how information about *why* one should sort is also necessary for participation in a behaviour. However, none of the respondents report that they saw this information, which is a consequence of them not noticing the advertisements from Follo Ren. Several respondents express that they do in fact desire this information and that it would influence their behaviour. What this shows is that the manner in which this information was conveyed did not suffice for the respondents. A potential explanation for this is that information may be ignored if presented in social media or among other information, and leaflets can be regarded as junk mail (Andersson et al., 2011). In fact, some respondents report that they deliberately avoid and ignore advertisements. While the potentially most important factor of an information campaign is actually getting the attention of a target group, as I will discuss in the next section, this approach might not have been sufficient in the given context.



There are two main elements of the campaign which respondents were asked about: the delivery of two rolls of green food waste bags on the doorstep and the advertisements on social media. I will begin by discussing the impact of the media campaign based on the evaluations performed by Follo Ren presented in section 5.4.1 and the respondents' answers and reasoning.

### *6.2.2 THE MEDIA CAMPAIGN*

The media analysis of the campaign described in chapter 4.3.1 showed that the desired number of individuals were exposed to one or more elements of the campaign (P. Jensen, personal communication, 28<sup>th</sup> March 2022). This means that there is a high potential that many people were reminded to sort their food waste separately into the green food waste bags. Whether the individuals who were exposed to the advertisements were actually influenced is not something the media analysis can tell us. Of the 19 respondents in the qualitative interviews, only one person explicitly remembers seeing one of the advertisements that formed the campaign. While this could indicate that it was not an effective strategy, I take this with a grain of salt. I only interviewed 19 people and therefore cannot say much about whether the differentiated information campaign was successful or if this was an appropriate and necessary approach when the respondents did not report seeing it.

While my respondents' experiences could indicate that the campaign has simply been exposed to citizens but has not been registered by them, the positive indications from the media analysis suggest that there is a higher likelihood that my recruitment strategy provided me with an 'unlucky draw' of the population. Indeed, the selection of respondents may also consist of individuals who by (un)luck of the draw do not relate to the situations depicted for their target group. This was not un-anticipated. An example of this exists for the one respondent who reports that they noticed an advertisement that was part of the campaign. This respondent belongs to the target group 'families with young children'. They explain that the advert depicted a scenario they could not relate to and therefore it had no impact on the respondent. Furthermore, this respondent explains that they are friends with an employee at Follo Ren and only saw the advertisement because said friend shared it on Facebook. Alongside some of the other respondents, they state that they do not 'follow' Follo Ren on social media and explain that this may be the reason why they have not noticed the campaign. As mentioned above, a few respondents report that they deliberately avoid advertisements and actively try to not notice them. Advertisements are marked as such in social media and this clear designation can increase the act of deliberately ignoring advertisements. Whether my respondents' experiences,

or lack thereof, with the advertisements ring true for the entire population of Follo is not a conclusion I can draw. Despite this setback, it is still possible to examine certain aspects of the campaign. Firstly, was the delineation of target groups appropriate if we consider my respondents?

### *6.2.3 TARGET GROUP ADAPTATION*

Individuals belonging to the group ‘young males aged 20-29’ were presumed to be less stringent with sorting food waste than other waste categories as well as barred by lack of space for the necessary sorting facilities. Further, they were expected to be environmentally concerned but to not necessarily translate this into action. Of the six respondents from this group, three did not sort food waste, and the assumptions rang true for all three. These individuals reported sorting the other waste categories but were barred by lack of the necessary sorting facilities, space, and knowledge. Interestingly, the knowledge they express concerning how to sort the other waste categories is largely experience-based. For instance, two of them state that they have figured out where to discard of glass and metal simply by driving around until they found the relevant bins. This indicates that they have either not received or not noticed information concerning how to use the sorting scheme in Follo. All three were concerned about the environment but shared a more pessimistic view concerning the impact of individual level efforts which led them to not translate their intentions into action. In contrast to these respondents, the three who do sort their food waste reported being very stringent about their behaviour and were not barred by any situational factors. It seems, then, that the pre-campaign analysis was rather accurate when describing this group. The differences between those who sort and those who do not is that the former do not share the perception of barriers with the latter.

The target group ‘families with young children’ was described as being limited by the sorting efforts and eating habits of their young children as well as by time-constraints. Respondents from this group reflect this description well when they express that the situations where food waste ends up in the residual waste bin are often the result of their children being lazy or messy. Families with the youngest children express that food mixed with paper towels as well as hard-to-clean food packaging are the main reasons, while families with school-aged children explain that they often find forgotten packed lunches that they do not dare open which end up in the residual waste. The one respondent who noticed an advertisement belonged to this target group. They explained that the depicted situation of food waste ending up among toys did not resonate

with them as it was not a situation they could relate to. They did, however, remember the content of the image, indicating that it caught their attention enough to be registered.

The third target group, ‘adults aged 55+ without children at home’, were assumed not to sort under the excuse of not having enough food waste. While the assumption of low amounts rang true, only one of the six respondents explained that they had at one point opted out of sorting because of little food waste. In general, this group was found to be dutiful, as was also assumed by the pre-campaign analysis (Mannheimer, 2021).

In sum, the target group analysis and the subsequent delineation of target groups were reasonably accurate. Whether the situations depicted in the advertisements were relatable is not possible to say due to only one respondent having registered one, so the content of these will not be discussed. While my respondents did not report noticing any of the target-adapted advertisements, the accuracy of the target group delineations in combination with the positive reach of the media analysis suggest that the campaign could have been noticed by other individuals in the larger population.

#### *6.2.4 THE DELIVERY OF FOOD WASTE BAGS TO EACH HOUSEHOLD*

Most respondents remember receiving the rolls of green bags on their doorstep in September 2021. The respondents who did not remember mainly belonged to target group 1: young males aged 20-29. An explanation for why they did not notice this is that they all rent an apartment and are therefore not personally connected to Follo Ren. This disconnectedness is also true for the other respondents who neither remember receiving the bags nor the text message sent prior to delivery. These respondents report that their roommates or spouses are registered as customers of Follo Ren and will have received this information. As respondent 2.2 says, they have divided responsibilities in the household where their spouse is responsible for anything to do with Follo Ren and waste collection, leading to the respondent not paying attention to or receiving any information.

While the majority of respondents remember receiving the rolls of green bags, only four respondents remember receiving information about the delivery. All but one respondent reacted positively to this reminder. The one respondent who reacted negatively composts their food waste and expressed annoyance at the gesture. As they have no personal use for the bags, they viewed the delivery as unnecessary and tried to return them to no avail. In a less negative

manner, some respondents report that the gesture was nice but that they have such good access to new rolls that it did not seem necessary. This relates to respondents with shared collection bins who then have continuous access to new bags and who do not hold responsibility for restocking. However, they valued the reminder and understood the rationale behind the delivery, even when they had not registered information about the delivery and the reason behind it. As respondent 2.7 reasons: “I thought that ‘well, then we’re too bad at this. Yes, that’s the incentive here: These are the bags you should use’”.

Especially respondents from target group 2, families with young children, report positive experience with this extra delivery of food waste bags. They reason that this is due to the large amounts of food waste produced by several people in the household and the subsequent necessity for changing the food waste bag more frequently. Specifically, the younger the children, the more positive they were about the delivery, as it created accessibility and convenience. As respondent 2.3 says: “We’ve received a lot of them, but I think it’s really nice to have them so readily available”.

The delivery was not always credited for its intentions. Two respondents explain that they remember finding the rolls on their doorstep and believed it to be their neighbour’s doing. Another respondent explains that they thought it was a pre-emptive move in the run up to Christmas and the expected increase in amount of food waste. These responses, alongside the fact that only four respondents remember receiving information about the delivery, suggest that the accompanying information was not conveyed in a suitable manner. The manner in which this information is conveyed may then need to be reconsidered and take into consideration that not everyone will pay attention to a text message that is not experienced to apply to them.

Two respondents who do not sort food waste remember receiving the bags but were not prompted to begin participating in the scheme. Respondent 3.5 explains that it resulted in a feeling of guilt about not participating in the scheme, while respondent 1.5 explains that they thought it was a generic delivery to all households but that it didn’t apply to them as they were not aware of the possibility for them to participate in the scheme. This respondent lacked the necessary knowledge and equipment to begin sorting, but reasons that this may be because their roommate is registered with Follo Ren and may have received the information without passing it on. Still, the delivery of the rolls may have benefited from having information about

the prompt attached directly to the bags to provide information in a more convenient and efficient manner.

By contrast, another respondent reports that their household began sorting food waste in the autumn specifically as a result of this element of the campaign: “It’s only this past year where we received some form of ‘here come the green bags’ message. Yeah, something made us think, OK now we’ve got to start doing that”. They explicitly remember their spouse telling them they had received a reminder to use the green food waste bags and thinking they needed to improve. The reminder worked specifically as intended in this situation. The respondent explains that they had had intentions of sorting food waste previously but had needed the reminder to begin.

One respondent provides a description of a situation that can explain the experience of several respondents. Prompted by my question about the delivery during the interview, they are reminded of the delivery and pick up their phone to go through their received messages, quickly happening upon the message from Follo Ren. They explain that because they know how to get hold of new bags, they probably did not view the message as relevant to them and therefore did not register it or the content. This is a typical reaction to such messages that are perceived as irrelevant to the personal situation of the receiver (Bernstad, 2014). Additionally, respondents from all target groups express that they do not prioritise reading information from Follo Ren in their busy everyday lives. Thus, they may have received and read or skimmed the message and immediately forgotten about it due to its perceived irrelevance.

In sum, the delivery of the food waste bags on the doorstep of every household in Follo had an overall positive effect. Most respondents appreciated the gesture even though they did not need the extra bags and were not influenced in any particular way. Although only one respondent reports being explicitly influenced to take up the act of separating their food waste, the prompt functioned as it was intended: it raised awareness, increased accessibility and reminded citizens of the possibility and necessity of sorting food waste correctly. Not all respondents experienced the delivery as relevant to their life-situation as they know how to access new bags. Taking this into consideration, it may be beneficial to tailor the way this information is conveyed to be more obvious and convenient. For instance, in addition to the text message, attaching a small leaflet to the delivered bags would ensure that the receiver explicitly understands the intention behind the delivery. Furthermore, to relate those who do not yet sort due to lack of facilities,

attaching simple instructions on how to receive the equipment could have potential. With such considerations, the overall positive effect of this campaign element begs repetition.

### 6.3 WHAT FUTURE APPROACH(ES) COULD INCREASE FOOD WASTE SORTING EFFICIENCY IN FOLLO?

Compiling the experiences of respondents shows that there are three main barriers that could be beneficial to address: (i) lacking sorting equipment and/or space for it; (ii) packaging; and (iii) rumours. I will now discuss if, why and how Follo Ren should approach these barriers in order to reduce food waste sorted into residual waste in the region.

#### 6.3.1 ENSURE ACCESS TO NECESSARY EQUIPMENT

As previous literature suggests, the main pre-requisite for participating in a sorting scheme is having the necessary sorting equipment, and this should be appropriate and convenient (e.g., Principato, 2018). Facilitating convenience requires creating a sorting scheme that is easy to understand and use. As described in section 6.1, there is a general satisfaction with the food sorting scheme in Follo. However, some respondents still express that they lack the food waste bin or the space for it in the kitchen. The former issue is something that Follo Ren could focus on. By looking at the positive responses to the delivery of food waste bags to each household, it is safe to assume that performing a small campaign focused on ensuring that everyone has a food waste bin would not produce negative responses. This would, as with the provision of bags, increase the perception of convenience. Of course, as each household only needs one food waste bin, the provision would have to occur somewhat differently. The issue concerning lack of storage space is trickier. One respondent expressed that as long as they had the necessary bin, they would be more likely to sort, despite lacking a convenient space for it in their kitchen. This may confirm the fact that ensuring convenience can reduce perceived barriers. The respondent could then place the bin somewhere that made sense to them, as exemplified by the respondent who has placed the food waste bin on a chair in the kitchen, and subsequently act on their intentions to participate in the sorting scheme. Providing examples of how other households with lack of space have solved the issue can nudge individuals who experience this issue to change their behaviour (Hohle & Nilsen, 2022). Another suggestion comes from a respondent:

I mean, it's almost like one should collaborate with IKEA. That there was a bag that fit their system because a lot of people have that drawer with waste bins, many have IKEA kitchens so of course that would make it more practical.

Behind this thought lies the idea of creating convenience to reduce the possible perception of a barrier. While this respondent was not hindered by the bad fit, there may be others who experience it as an issue. Approaching this could entail collaborating with kitchen designers, working with trade organizations or using a similar nudge as suggested above where examples of how others deal with badly fitting bags are presented.

The benefit of focusing on ensuring that sorting equipment is accessible and conveniently designed is that it has previously been found to lead to long-term improvements (e.g., Bernstad, 2014; Refsgaard & Magnussen, 2009) and it is more likely to influence both those with strong intentions to sort and the less concerned (De Young, 1990). This can be seen in how several respondents report that they sort out of a sense of duty; they sort because they are expected to and because the system suggests, and somewhat prescribes, it. As respondent 1.6 says, “As long as it isn’t inconvenient for me to sort food waste, I’ll do it”. Providing sorting equipment also holds potential of minimizing perception of inconvenience (Stoeva & Alriksson, 2017). It decreases perceptions of effort and the degree of influence from various situational variables. Continuously ensuring that citizens experience the sorting system as convenient and intuitive as well as reminding them that they should use the equipment should be a perpetual priority.

There is one specific instance that is worth returning to that relates to accessing the sorting equipment. It regards how one respondent, a student at the university, experienced a lack of information when he moved to the region. While Follo Ren provides information to new citizens, this respondent did not receive such information, possibly as a consequence of renting an apartment from the university and therefore not being directly connected to the waste company. Still, when trying to gather the necessary information in order to participate in the sorting scheme, the respondent faced a language barrier. They suggest a more thorough collaboration with the university wherein information about the sorting system is conveyed to international students at the beginning of each term. Further, they suggest, alongside other respondents, that providing information on or near the sorting equipment would likely help decrease uncertainties about how and what to sort where.

The positive impact of the delivery of food waste bags to each household illustrates that it is beneficial to continue conveying messages of ‘how to sort’ rather than ‘why to sort’. Although citizens continue to request information about why they should sort their wastes, they are aware of the benefits despite some uncertainties. What they are more in need of is an intuitive, convenient and accessible sorting system that allows them to act on their intentions. In sum,

while facilitating and optimizing household waste sorting infrastructure is an obvious prerequisite for participation in a waste sorting scheme, it should not be assumed that there is no room for improvement and maintenance of the system to ensure continued participation.

### *6.3.2 REMOVE UNCERTAINTY ABOUT PLASTIC PACKAGING*

The second and probably most prominent barrier concerns how plastic packaging influences sorting efforts. All respondents report that the main reason food waste ends up in the general waste in their household is because they do not rinse packaging or discard of out-of-date food without separating it from its original packaging. This has previously been found to be a national issue in Norway (Hanssen et al., 2016). Related to this is the barrier of mixed wastes, especially the combination of food and napkins or paper towels left over on a plate after a meal. Respondents express uncertainty about whether they should rinse packaging and the necessity of it. Further, they lack the knowledge that paper towels mixed with food can be discarded of in the food waste. These uncertainties lead to mixed wastes ending up in the residual waste bin and contaminating other wastes. This barrier also relates to the effort that is required to rinse packaging. The uncertainty regarding the necessity to rinse plastics enhances the perception of effort, reducing willingness to participate.

These uncertainties illustrate situations that Follo Ren could utilize to relate to citizens. We know that information tends to be more effective if it targets specific behavioural barriers (Vlek & Steg, 2009). Thus, creating a campaign that focuses on the necessity of rinsing packaging before discarding it would probably be a productive approach. The uncertainty about whether one should rinse plastic in Follo stems from a specific ‘past behaviour’. Plastic used to be sorted and collected separately in Follo before Follo Ren began utilizing a new waste sorting facility at ROAF. Further, plastic is sorted separately in Oslo, the neighbouring region, and several respondents are familiar with this through having lived there or knowing someone who does. They explain that having to now sort plastic into the residual waste bin has made them uncertain about whether they need to rinse the plastic because they do not know whether or trust that the plastic then gets recycled. As respondents 1.1 and 3.1 say, they are heavily affected by the rumour that everything goes to the same incinerator. Further, respondent 2.6 points out that they were demotivated by a TV programme about how ineffective the waste sorting facilities in Oslo were. It gave them an excuse to opt out. Focusing on removing these uncertainties by conveying information about the actual current processes in an appropriate manner should be considered.



It is worth mentioning that Follo Ren performed a campaign on the topic of plastic somewhat simultaneously to the food waste campaign. The plastic campaign conveyed information about what happens to plastic when sorted into the residual waste bin under the current system (Follo Ren, n.d.b). It aimed at reducing the uncertainties about whether plastic is still recycled in Follo now that it is not collected separately. The webpage containing this information does not, however, describe the necessity of rinsing plastic packaging or the level to which this should be done. Plastic should be rinsed, because as P. Jensen (personal communication, 26<sup>th</sup> April 2022) said: “You can’t make plastic from ketchup”. What she means by this is that it is necessary to rinse plastic packaging to remove the larger quantities of food remains. But there is no need to scrub packaging and remove every morsel of food, as the rumour that respondent 3.3 had heard assumes: “You often heard that if there were some spots or a little bit of leftover food, it was all a waste”. While none of the respondents mention seeing the plastic campaign either, one could recommend creating a campaign that focuses on reducing this uncertainty and eliminating these rumours. The food waste campaign intended to convey that food waste sorting is easier than people experience it to be, and a campaign on plastic should have a similar main message because rinsing plastic packaging is easier than what respondents think. I will return to how such information may be conveyed in section 6.3.4. Meanwhile, when thinking about whether they had seen any adverts about waste recently, a few respondents think explicitly about whether they might have seen anything on the buses recently. Maybe this could be a beneficial advertisement placement for conveying that people should rinse their plastic?

### *6.3.3 ELIMINATE RUMOURS*

A continuation of this issue, the third barrier relates to the cognitive response that individual sorting efforts are superfluous when it is uncertain whether plastics are actually recycled when sorted into the residual waste bin. Several respondents mention that they are influenced by the rumour that all waste goes in the same incinerator and that it is therefore not necessary to rinse packaging or even to sort waste. It relates mostly to plastic packaging, and somewhat ties into the influence of past behaviour and the change to the sorting system. Respondents, and their social circle, do not seem to have received the information about why they aren’t sorting plastic anymore and have assumed that now it all goes to the same incinerator and is not recycled. This could be influencing the willingness to rinse plastic. Sorting then isn’t cognitively legitimate. Why should they spend effort sorting and rinsing if it’s all incinerated anyway? This is something that the company could address through information, as it is caused by a knowledge deficit. With what respondents say about not noticing information or adverts, it

might be fruitful to do something like the Atle Antonsen campaign. The catchy element of such an advert, the humour and the fact that they can relate to it because it has been shown before and is a situation they can relate to, might just work.

#### 6.3.4 NUDGING

The Norwegian climate psychologist Per Espen Stoknes once said: “We need to make environmentally friendly choices so simple that we cannot refuse them” (Hohle & Nilsen, 2022). This quote captures the essence of nudging and reflects what the respondents interviewed for this thesis express. As respondent 1.6 stated: “If it’s as much of a hassle doing the environmentally friendly thing as doing the non-environmental thing, I rather choose the environmentally friendly option”. While the information campaign was not designed to include a physical nudge, the responses that the delivery of food waste bags to each household produced cause it to resemble a nudging-intervention. Delivering food waste bags to all households aimed to remove a barrier, which is one of the main nudging types (Hohle & Nilsen, 2022). Instead of assuming that citizens were not consistently sorting their food waste into the intended food waste bags, Follo Ren identified a barrier that several citizens experience. Sorting food waste separately is an easy action to perform as long as the necessary equipment is in place. Thus, providing citizens with the necessary food waste bags reminded them of how accessible and convenient the design of the system is. As one case illustrated perfectly, it prompted reflections about their sorting behaviours, nudging them to be more conscious of their waste separation actions, and subsequently made them realise that doing the environmentally friendly thing did not require that much more of them.

While the food waste bag ‘nudge’ worked for a respondent with intentions to sort and the necessary equipment placed in an accessible manner, what can be done for individuals who have deliberately chosen to remove the food waste bin from their kitchen because they lack room? As discussed in section 6.3.1, providing examples of how other households with lack of space have solved the issue can nudge individuals who experience this issue to change their behaviour (Hohle & Nilsen, 2022). This nudge utilizes social norms to influence intentions and decreases the perception of a physical barrier by showcasing how others have overcome that barrier. Similar nudging techniques can be used for other issues concerning the incompatibility of the sorting equipment Follo Ren supplies, such as the fit of the food waste bags or how to eliminate smell.

As discussed above, the food waste bag nudge was somewhat successful, but under further examination through this thesis, other barriers emerged that also beg attention. While most respondents find separate food waste sorting easy, they are constrained by the extra effort required for rinsing packaging and separating mixed wastes that contain food. As discussed in section 6.3.3, this barrier requires informational measures as it concerns a knowledge-deficit. However, because of the drawbacks and low impact of information, combining it with other instruments can be productive (Schultz, 2002). When asked about what could improve waste sorting behaviour, respondents suggested utilizing elements that resemble nudges. One suggestion expressed by several respondents is to create sorting guides that are placed on or near the sorting equipment and collection bins. Placing information or other forms of reminders that demand reflection or consciousness around the act of sorting has proven to be effective in several experiments (e.g., Xu et al., n.d.). Creating a nudging-intervention that provides simple information about why and how to rinse packaging based on these insights has potential to eliminate this widely experienced barrier among the population of Follo and subsequently eliminate rumours that inhibit ideal participation in the waste sorting scheme.

In sum, the three main barriers, (i) lacking sorting equipment and/or space for it; (ii) packaging; and (iii) rumours, ought to be approached using a combination of information and nudges. Ensuring that equipment is accessible, convenient and intuitive can reduce the perceived effort of sorting wastes separately. Further, reducing uncertainties about the necessity of sorting separately can help eliminate the rumour that it is not necessary to rinse and sort wastes. This would reduce the amount of food waste left over in packaging that may be contaminating other wastes in the residual waste bin. The latter requires providing information which refutes rumours. However, as the qualitative findings suggest, this information may need to be presented in a more obvious manner to be registered. Removing cognitive barriers like uncertainty and rumours will sow the seeds for increased intentions to sort. These intentions are a prerequisite for performing the behaviour. Yet nudges that alter the physical context so that the desired action is the most intuitive to perform seem to be of necessity as they are more likely to influence those with low or no intentions to sort. Assuming bounded rationality, or that individuals are likely to be more concerned about other things than sorting, especially when they are pressed for time, and the subsequent acknowledgement that the most convenient and intuitive action will be performed, implies that it is necessary to nudge people to make the better choice. Not everyone will change their actions of their own volition. For such individuals, nudging has a larger potential to influence behaviour than information. Thus,

combining information and nudging is a recommended approach as they can influence intentions and subsequently behaviour.

#### 6.4 LIMITATIONS

While some general limitations were described in chapter 4, it is relevant to return to constraints that the COVID-19 pandemic has inflicted on the topic of this thesis as discussed in section 5.4.3. The extensive periods of restrictions which meant that Norwegians spent a large amount of time at home may have influenced food waste sorting behaviour. For one, more food was prepared and eaten at home, likely leading to larger amounts of inedible food wastes from food preparation. Whether spending time at home during the pandemic influenced food waste sorting behaviour is not something this thesis was able to address. A larger residual waste audit by Follo Ren was planned to be performed in the spring of 2022 but was postponed due to a staff changeover. Whatever Follo Ren decides to do in the future to reduce the amount of food waste that ends up in residual waste, they should take into consideration what the next large residual waste audit indicates. Ideally, a future study would combine the results from the planned residual waste audit with a large-scale quantitative survey examining food waste sorting behaviour and the campaign experiences of the wider population of Follo. This would allow for an evaluation of the impact of the campaign by comparing stated food waste sorting behaviour with actual behaviour (based on what the audit says). While this thesis has provided some insight into what the citizens of Follo might experience as a barrier to fully sorting their waste, it has been limited by a) being a qualitative study with subsequently few participants and b) not having access to data on the actual, large-scale impacts of the campaign. Again, the pandemic may have changed food waste related behaviours. Whether people will resort to old habits once life returns to something that resembles pre-pandemic times or not is unknown. However, while we do not know the actual, tangible effects of the information campaign, this thesis has provided some interesting cognitive findings which can hopefully help Follo Ren facilitate its sorting system even more conveniently.

## 7. CONCLUSION

The aim of this thesis was to examine the effects of a differentiated information campaign performed in Follo, Norway and explore the potential importance of situational barriers for food waste sorting on behalf of the municipal waste management company Follo Ren. To answer these objectives, four research questions were formulated: (i) *what are perceived and experienced barriers to sorting among respondents from each target group*; (ii) *in what way do the identified barriers influence respondents' food waste sorting motivations and behaviour*; (iii) *was the differentiated information campaign an appropriate approach to combating low food waste sorting degrees in Follo*; and (iv) *what future approach(es) could increase food waste sorting efficiency in Follo?*

To answer the research questions, a qualitative approach was employed. 19 semi-structured interviews with individuals from each target group were conducted. The research was based on theoretical knowledge of the prerequisites for individual participation in a household recycling scheme, the use of information and nudging as policy instruments for influencing waste sorting behaviours, as well as knowledge concerning the importance of barriers to participation.

Starting with research questions 1 and 2, the qualitative findings reveal that respondents do experience some barriers that can explain why food waste ends up in the residual waste bin. Lacking the necessary sorting equipment, lacking space for said equipment and plastic packaging constitute the main physical barriers. These barriers are related to and interconnected with social influences, environmental numbness, lack of knowledge, perceptions of effort and habits. The identified physical, situational and motivational barriers seem to limit willingness to sort food waste by increasing the perception of effort and inconvenience required. They cause uncertainty and provide excuses which subsequently lead to lower amounts of effort granted to sorting separately, subsequently leading to food waste ending up in the residual waste bin even among the more exemplary individuals.

Examining whether the differentiated information campaign was an appropriate approach to influencing food waste sorting behaviour in Follo provided ambiguous results. The two preliminary evaluations performed by Follo Ren gave a positive indication of the effects, where the media campaign had a satisfactory reach, and the residual waste audit suggested a slight increase in separate food waste sorting. At the same time, the interview respondents' answers

suggest low registration of the campaign. Thus, to what extent the increase in separately sorted food waste is a result of the campaign is difficult to determine. Indeed, there may be other causes of the changes in separately sorted food waste. Further, while the delineation of target groups was reasonably accurate, it seems that the information did not have the desired reach and impact it was designed for. On the other hand, the indicatory success of the delivery of food waste bags suggests that reminding citizens to sort is possible but may need to be conveyed in a more obvious and convenient manner. As such, the information campaign had one element which marks success and appropriateness in the given context, based on the answers from the interviews. Whether the media campaign had an impact on the general public of Follo is difficult to say given the limited scope of this qualitative study. Therefore, it may be necessary to conduct a large-scale survey in combination with a large, in-depth residual waste audit before dismissing differentiated information as a useful approach.

Lastly, leading on from the findings from the first three research questions, a recommended approach was formulated. A productive pathway for Follo Ren to follow includes removing perceptions of effort and inconvenience by addressing the identified barriers through the use of information and nudging interventions. Continuing to provide information will be necessary, but the manner in which it is conveyed may need adjusting for it to be registered by citizens. Transferring knowledge and experience from how to facilitate the physical sorting system, it seems that providing information in a more convenient and direct manner is necessary. Information will be a necessary element going forward because it can increase knowledge, remove uncertainty and eliminate rumours about the sorting system. It can thus influence intentions to sort. For these intentions to be translated into action, I recommend using nudging interventions. Nudging interventions work because several of the choices we make need to be taken quickly and without much consideration (Hohle & Nilsen, 2022). In a decision-making situation, the simplest option is chosen. Therefore, the more barriers we experience, the less likely we are to perform a certain action, even when intentions are high. As we have seen, ensuring convenience is key. Exploring the use of nudging to increase food waste sorting can potentially provide good results, as indicated by the provision of food waste bags during the campaign period. Most citizens of Follo are aware that they should sort their wastes yet perceive and experience a variety of barriers which limit their intentions to separate all their food waste consistently. Therefore, combining the provision of information in a convenient manner with tailored nudges might be the necessary next step for Follo Ren.

Overall, this thesis should be considered as a guidance for Follo Ren in its future endeavours where food waste sorting is concerned. It pays to understand one's target audience, and Follo Ren seems to have a good sense of its citizens' wants and needs. Combining this understanding with the appropriate informational measures and facilitating convenience is what is needed to achieve the relevant political goals. Thus, I highly recommend considering the use of nudging-interventions in combination with convenient and simple information as this combination is likely to have a larger impact than information and equipment provision alone. In conclusion, in order to reduce the amount of food waste that ends up in the residual waste bin individuals need to be aware of the necessity of the action and need to be continuously reminded to perform it. Still, it is necessary to assume bounded rationality and accept that people are not going to prioritise sorting their waste perfectly if it requires a perceived unreasonable amount of effort from them as individuals. Creating convenience and fashioning nudges that influence actions subconsciously will be necessary. The more convenient the action is experienced to be and the more frequently it is performed by an individual, the more likely it is to become a habit driven by social and moral norms. Testing the recommended nudges will be the most important next step for Follo Ren in order to assess the validity of the findings made in this thesis. To go back to the analogy on energy that introduced this thesis: by lowering the perception of effort, or energy, needed to sort all food waste separately, the more energy we can productively convert into new foods and fuels.

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# APPENDIX 1 - INTERVIEW GUIDE

## INFORMASJON TIL RESPONDENTEN:

Jeg er masterstudent på NMBU og skriver masteroppgave i samarbeid med Follo Ren om matavfall.

Formålet med oppgaven er å innhente kunnskap om hva innbyggerne opplever av problemer rundt å kildesortere matavfall. I Norge havner 50% av matavfallet i restavfallet i dag. Det er altså slik at halvparten av matavfallet ikke kildesorteres i grønn pose, men kastes i restavfallsposen. Det kan være mange årsaker til at innbyggerne ikke kildesorterer matavfall. Vi ønsker å undersøke disse slik at flere kan kildesortere.

## PRAKTISKE OPPLYSNINGER

- Det vil ta ca. 30. Som skrevet i informasjonsskrivet blir det tatt opp – er dette fortsatt ok?  
Trykk ta opp, be formelt om at opptak er ok

Har du noen spørsmål før jeg begynner?

## BAKGRUNNSINFORMASJON

Vil du kanskje begynne med å introdusere deg selv?

1. Hvor gammel er du?
2. Kjønn?
3. Hva er ditt yrke? Jobber du fulltid?
4. Hvilken utdanning har du?
5. Hva slags nabolag og hus bor du i?
6. Har du/dere bodd her lenge?
7. Hvor mange bor i din husholdning? Hvor mange av disse er under 18?

Er det noe du vil legge til om deg selv som du føler er relevant?

Som sagt undersøker jeg kildesortering og kommer nå til å stille noen spørsmål om dette

## INFRASTRUKTUR OG RUTINER

1. Hvilke typer avfall sorterer du hjemme?
  - a. Synes du det er enkelt å sortere? Er du fornøyd med kildesorteringssystemet i Follo?
  - b. Har du matavfallsbeholder og poser?
  - c. Hvor står matavfallsbeholderen din?

- d. Hvor lenge har du sortert matavfall separat?
  - e. Har du sortert matavfall før innføringen av systemet i 2017? F. eks. Kompost.
2. Sorterer du alt matavfall?
    - a. Hva gjør at du evt. ikke sorterer matavfall?
    - b. Tror du du kunne kastet mer matavfall i grønn pose?
    - c. Hva slags mat er det du sorterer? Rester? Skrotter o.l.?
    - d. Er det noen typer matavfall du sorterer i restavfallet? Hvorfor?
    - e. Er det noen situasjoner hvor du ikke sorterer matavfall? Hvorfor?
    - f. Blir du forhindret av ting som lukt og mugg?
  3. Hvor mange poser kaster du hver uke?
  4. Har det blitt en vane for deg å kildesortere?
    - a. Hvor lenge vil du si det har vært en vane?
    - b. Hva var viktig for at det ble en vane/rutine for deg å sortere forskjellige typer avfall?
    - c. Er det forskjeller mellom ulike medlemmer i husstanden når det gjelder sorteringsrutiner? Hvorfor?
  5. Hvordan har du organisert avfallsløsningen i boligen?
    - a. Bruker du kurven Follo Ren deler ut gratis? Har du et integrert system som fulgte med kjøkkenet?
    - b. Kunne du organisert det på en annen måte?
  6. Hvordan får du tak i grønne poser?
    - a. Er det en enkel måte? Kunne det vært bedre?
  7. Har du felles avfallsbeholder eller enkeltbeholder?
  8. Hvor langt må du gå til beholderen?
    - a. Syns du det er en grei måte å gjøre det på?
    - b. Hvis langt – hva opplever de som langt? Er det en naturlig vei for deg å gå?

## INFORMASJON

1. Er du kjent med Follo Ren? Hvilket forhold har du til selskapet og kildesorteringsordningen?
2. Kan du huske da matavfallssortering ble innført?
  - a. Husker du om du begynte å sortere matavfall med en gang? Hvorfor (ikke)?
3. Har du fått nok informasjon om hvordan sortere matavfallet?
  - a. Om du mangler informasjon, oppsøker du det? Isåfall, hvor?
4. Har du fått utstyret du føler du trenger?
  - a. Hvis nei, hva mangler?
5. Kunne Follo Ren gjort noe mer for å tilrettelegge?



## KAMPANJE-EVALUERING

1. Kan du huske å ha sett reklame for Follo Ren de siste månedene?
  - a. Husker du hva den handlet om?
  - b. Husker du hvor du så den?
  - c. Har den påvirket deg/ har du bevisst sortert mer etter at du så reklamen?
2. Mottok du grønne poser i høst på dørstokken?
  - a. Follo Ren brukte dette som en slags kickstarter for innbyggere som ikke har begynt med sortering av matavfall enda eller som ikke har klart å komme i gang – opplevde du at det fungerte som en kickstarter for deg? Om enn bare en påminnelse?
3. Vet du hvor og hvordan du får tak i nye grønne poser? (som resultat av rullene på dørstokken)

## ATFERD OG MOTIVASJON

1. Hva motiverer deg til å sortere matavfall?
  - a. Syns du det er verdt tiden din? Er du motivert for å gjøre det av miljømessig hensyn eller fordi det er det systemet krever av deg og du følger «regler»?
  - b. Synes du det tar for mye tid å sortere?
  - c. Opplever du det som en plikt å sortere avfall? Hvordan oppleves det? Er det en plikt fra kommunen eller et personlig ansvar?
  - d. Blir du påvirket av andres sorteringsatferd og meninger? Naboer, venner, kollegaer.
  - e. Er avfall noe du prater med andre om? Hvem? Hva prater dere om?
2. Vet du hva matavfallet blir brukt til?
3. Reagerer du hvis andre ikke sorterer matavfall?
  - a. Reagerer andre hvis du ikke sorterer?
4. Sorterer du andre typer avfall?
  - a. Hva motiverer deg til å sortere generelt?
5. Er du opptatt av miljø og bærekraft?
  - a. Tror du det er viktig for miljøet at vi sorterer avfallet vårt? Hvorfor (ikke)?
  - b. Tror du at ditt syn på miljø generelt påvirker om du sorterer?
6. Hvilke andre handlinger utfører du med bakgrunn i at det er bærekraftig? Eks. Kjøre mindre/ ta kollektivt, spise mindre kjøtt, dusje kortere etc.
7. Har du intensjoner om å sortere matavfall mer i fremtiden?
  - a. Hvis ja, hva må til for at du skal gjøre det?
  - b. Hvis nei, hvorfor ikke? Og er det noe som ville fått deg til å gjøre det?

## TIL SLUTT

1. Vi har nå snakket om noen sider ved sortering av matavfall. Kan du til slutt oppsummere de viktigste grunnene til at du ikke sorterer matavfall?
2. Er det noe du ønsker å legge til?

Tusen takk for at du tok deg tid til å bli intervjuet av meg! Ha en fin dag.

## APPENDIX 2 – INFORMATION LETTER AND CONSENT FORM

### VIL DU DELTA I FORSKNINGSPROSJEKTET

#### Matavfallssortering i Follo

– en studie om effektene av en informasjonskampanje og barrierer til sortering?

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å undersøke hva innbyggerne i Follo opplever av problemer knyttet til sortering av matavfall. I dette skrevet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

#### **Formål**

Denne undersøkelsen er en del av en masteroppgave jeg skriver i samarbeid med Follo Ren IKS. Prosjektet har som formål å undersøke folks vaner og atferd rundt matavfallssortering, slik at Follo Ren i fremtiden kan forbedre sorteringssystemet og tilrettelegge for at innbyggerne kan sortere matavfallet sitt på en enkel måte.

#### **Hvem er ansvarlig for forskningsprosjektet?**

Institutt for internasjonale miljø- og utviklingsstudier ved NMBU er ansvarlig for prosjektet. Det er et samarbeid med Follo Ren IKS som bistår med data samt veiledning og assistanse for studenten.

#### **Hvorfor får du spørsmål om å delta?**

Denne undersøkelsen baserer seg på en informasjonskampanje utført av Follo Ren høsten 2021 rettet mot tre målgrupper av befolkningen som tidligere har uttrykt at det er vanskelig å alltid sortere matavfallet i grønn pose. For å undersøke om kampanjen hadde en effekt, og for å finne ut hva som gjør det vanskelig å sortere, ønsker jeg å intervju representanter fra hver av disse målgruppene. Du har blitt kontaktet fordi du faller innenfor en av disse målgruppene.

#### **Hva innebærer det for deg å delta?**

Hvis du velger å delta i prosjektet, innebærer det at du deltar i et intervju. Det vil ta ca. 30 minutter. Intervjuet inneholder spørsmål om din opplevelse med kildesortering og matavfall i Follo. Intervjuet vil bli tatt opp på båndopptaker på mobil.

#### **Det er frivillig å delta**

Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykket tilbake uten å oppgi noen grunn. Alle dine personopplysninger vil da bli slettet. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

#### **Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger**

Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrevet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

Det er kun veileder ved instituttet og kontaktperson hos Follo Ren i tillegg til studenten som vil ha tilgang til intervjudetaljene.

Intervjuene vil bli transkribert av studenten, og alle personlige opplysninger vil fjernes og erstattes med en kode.

I den ferdige oppgaven vil du være anonymisert, men kategorisert innenfor målgruppen du representerer. Dette er en vag personopplysning som ikke vil være mulig å koble opp til deg som enkeltindivid.

Datamaterialet vil bli lagret med anonymiserte data på en egen forskningsserver.

### **Hva skjer med personopplysningene dine når forskningsprosjektet avsluttes?**

Prosjektet vil etter planen avsluttes når oppgaven blir godkjent, som forventes å være innen august 2022. Etter prosjektslutt vil datamaterialet med dine personopplysninger anonymiseres. Dette vil bli gjort gjennom koder som ikke er koblet til navn eller kontaktopplysninger.

### **Hva gir oss rett til å behandle personopplysninger om deg?**

Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Institutt for miljø- og utviklingsstudier, NMBU har Personverntjenester vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

### **Dine rettigheter**

Så lenge du kan identifiseres i datamaterialet, har du rett til:

innsyn i hvilke opplysninger jeg behandler om deg, og å få utlevert en kopi av opplysningene

å få rettet opplysninger om deg som er feil eller misvisende

å få slettet personopplysninger om deg

å sende klage til Datatilsynet om behandlingen av dine personopplysninger

Hvis du har spørsmål til studien, eller ønsker å vite mer om eller benytte deg av dine rettigheter, ta kontakt med:

Kontaktperson NMBU: Jan Olav Aarflot ([jan.olav.aarflot@nmbu.no](mailto:jan.olav.aarflot@nmbu.no))

Prosjektets veileder Pål Olav Vedeld ([pål.vedeld@nmbu.no](mailto:pål.vedeld@nmbu.no)) og student Malin Elizabeth Diskin Nilssen ([malin.elizabeth.diskin.nilssen@nmbu.no](mailto:malin.elizabeth.diskin.nilssen@nmbu.no)).

Hvis du har spørsmål knyttet til Personverntjenester sin vurdering av prosjektet, kan du ta kontakt med:

Personverntjenester på epost ([personverntjenester@sikt.no](mailto:personverntjenester@sikt.no)) eller på telefon: 53 21 15 00.

Med vennlig hilsen

Pål Olav Vedeld

Malin Elizabeth Diskin Nilssen

(Forsker/veileder)

(Student)

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## Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet «Matavfallssortering i Follo», og har fått anledning til å stille spørsmål. Jeg samtykker til:

å delta i intervju

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet

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(Signert av prosjektdeltaker, dato)



**Norges miljø- og biovitenskapelige universitet**  
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