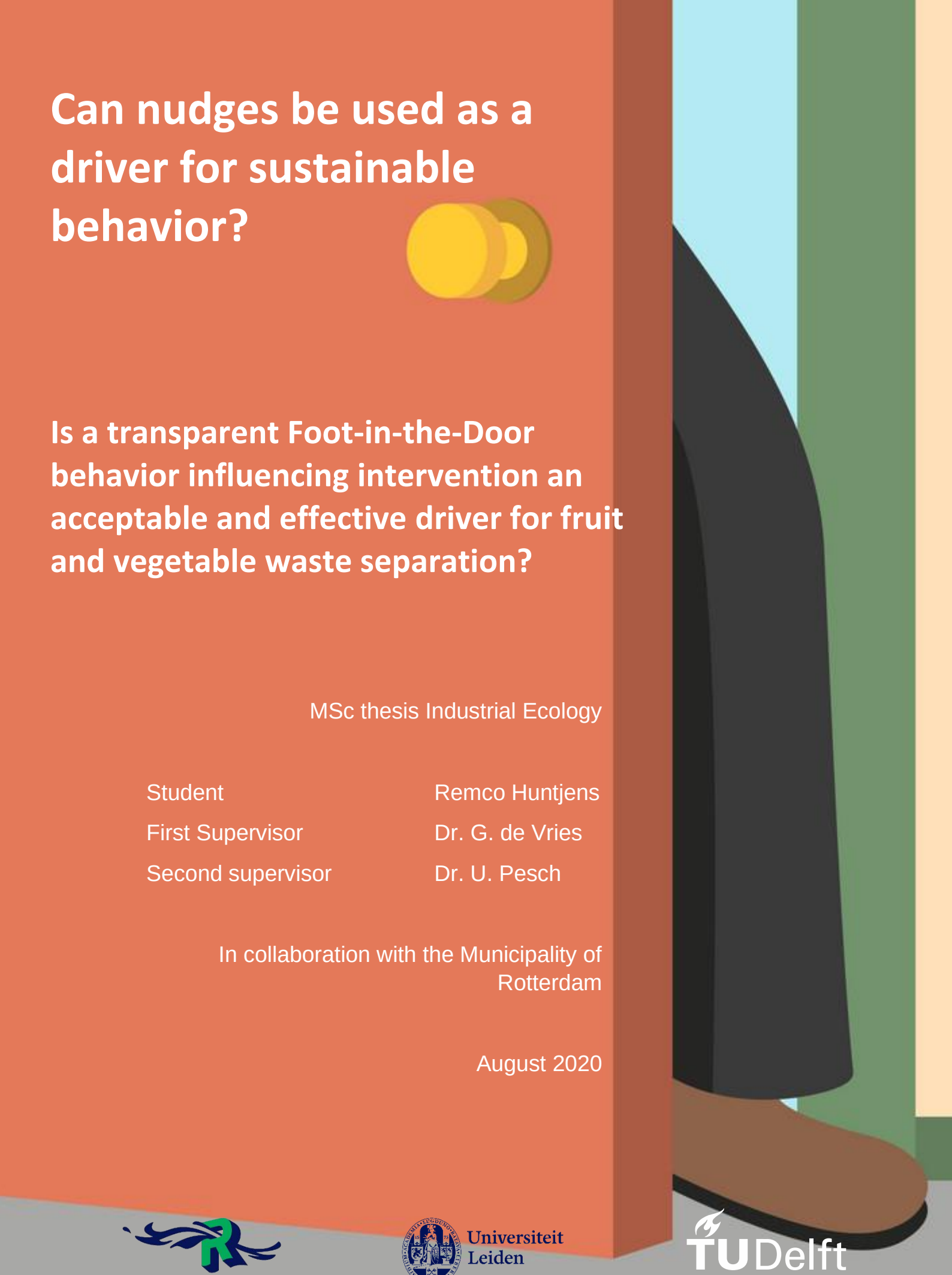
Can nudges be used as a driver for sustainable behavior?



Is a transparent Foot-in-the-Door behavior influencing intervention an acceptable and effective driver for fruit and vegetable waste separation?

MSc thesis Industrial Ecology

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Is a transparent Foot-in-the-Door behavior influencing intervention an acceptable and effective driver for fruit and vegetable waste separation?

A replication of the classic Foot-In-The-Door experiment to acquire new insights related to the debate about the ethical use of governmental nudging

By

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Summary

The environmental concerns among policymakers and citizens are growing, but few individuals are willing to act. Governments have also observed this lack of action and have an increased interest in the application of social sciences to steer people towards sustainable behavior. Preliminary research revealed that these interventions could be vital for the implementation strategy for fruit and vegetable waste in highly urbanized areas within the Netherlands.

The Foot-in-the-Door (FITD) behavior influencing tool is one of them. This tool consists of a small preparatory request and a more significant target request. Since people tend to remain consistent, this method increases the probability that a subject complies with a request. Already, researchers used this method successfully as a driver for sustainable behavior in other fields, such as energy and water consumption, waste separation, and public transportation. However, scientists nor policymakers tested the tool as a driver for residential fruit and vegetable waste separation.

Furthermore, there is a public and scientific debate about how acceptable the use of behavior influencing tools by policymakers is because people might perceive the use of these tools to be manipulative. Increasing transparency can make citizens aware that the government uses tools that drive them towards a desired sustainable choice and might make it less manipulative. Therefore, scientists claim that the interventions should be as transparent as possible and used only if other measures are inefficient.

Hence, exploring the effectivity and legitimacy of the FITD as a driver for fruit and vegetable waste separation might result in valuable information required by the government before they can implement these tools on a large scale. Therefore, this thesis aims to provide new insights into the effectivity and legitimacy of the FITD behavior influencing tool, by replicating the original experiment, which has proven to be useful as a driver for sustainable behavior in numerous studies.

For this experiment, the researcher asked participants living in Rotterdam near community gardens, if they were willing to dispose of separated household fruit and vegetable waste at the community gardens for one month. Prior to this request, some participants received a FITD treatment, and some were made aware of nudging. The total number of participants was too low to draw any reliable conclusions. Nevertheless, some of these findings might inspire future studies and supply future public and political debates with new insights.

The results indicate that the FITD is a capable driver for fruit and vegetable waste separation and that most of the participants perceived the intervention as acceptable. Therefore, if policymakers wish to stimulate the inhabitants to take part in the fruit and vegetable waste management system, they should consider using the FITD. However, the acceptability rates for the use of governmental nudges were significantly lower for the informed participants, as compared to the uninformed participants.

Moreover, results indicate that providing transparency after a person is subjected to the FITD intervention, eliminated the effectiveness of the intervention. Therefore, increasing transparency should be considered carefully. This experiment indicates that informing participants about the nudge, directly after the nudge was used, should be avoided.

Preface

For me, this project started with many questions about fruit and vegetable waste separation. It was clear that the implementation of the fruit and vegetable waste separation system is challenging. I observed that both national and local governmental bodies tend to look for technical and information distributional based solutions. I started with two supervisors Ulf Hackauf and Ellen van Bueren from the faculty of architecture to structure this problem. The scoping process was valuable, resulting in my final project, for which I am grateful.

When I was diving into the literature about waste separation, I learned about the available interventions. Combining these aspects with everything I learned during the master's program of Industrial Ecology, there was more to this challenge than just a technological solution or people's limited knowledge about waste separation. I concluded that, with the complexity of the problem, there was more to this question than just a purely technical or informative solution.

While finishing this master thesis, I am delighted and proud to add knowledge about green nudging to the database of the Master of Industrial Ecology. I hope that more people will see the importance of addressing the subject of the ethical use of governmental nudges, and it might spark the debate for future research and public debate.

This project would not have been possible without the help and support of Sander Beumer and Rinske Gosliga from the municipality of Rotterdam. First, I am grateful that Rinske offered me a place at the municipality of Rotterdam and introduced me to Sander, one of the project leaders. Despite his busy schedule, he found the time to be my direct supervisor. During the early stage of our collaboration, his feedback was precious for me, not only thesis wise, but he also provided me with many insights in the day-to-day works of policymaking on a municipal level. They also helped me to keep seeing the value of my thesis and to enjoy working on it and facilitated materials and opportunities during my thesis.

At his point, I want to thank my two supervisors from the TU Delft, who were of great support during the switch and the scoping of the final project. My first supervisor, Gerdien de Vries, for all her positive feedback and exciting ideas that helped to improve my research. My second supervisor Udo Pesch, for challenging me with his critical reflection of my thesis, and his input about the ethical aspect of governmental steering

1 INTRODUCTION

Even though there is a growing concern about the environment, few individuals are willing to follow-up this concern with behavioral actions in support of the environment, particularly when these actions require the individual to invest money or time (Gifford, 2007; Whitmarsh, 2010). Governments are trying to change people's attitudes to make more sustainable choices. A strategy is used that focuses on informing citizens about the benefits and by providing the facilities needed. However, this approach often fails to activate households due to perceived barriers (VANG, 2017). Hence, there is a growing awareness that policies and traditional interventions need to be complemented by behavior influencing interventions (Byerly et al., 2018).

Behavioral insights are being used more often in the design, implementation, and evaluation of policy instruments (Lehner et al., 2016). An example of using behavioral insights to influence individuals is nudging. A nudge is any factor that significantly adjusts human deeds by altering its selection landscape (Hansen & Jespersen, 2013). Nudges aim to steer people to make decisions that the nudger considers better or wiser. It does so without monetary incentives or significantly changing the options set itself (Sunstein, 2015).

Thaler and Sunstein first introduced the concept of nudging in 2009 (Thaler & Sunstein, 2009). This paper received much attention because of its appealing features. Over the years, it became apparent that various nudge based behavioral policies are often more cost-effective compared to traditional policies (Benartzi et al., 2017). Moreover, these tools use automated behavior interventions; individuals do not need to process nudges or make conscious choices, to make the desired choice more favorable compared to the original situation. Thus, they are easy to implement on a broad scale (Thaler & Sunstein, 2009).

Hence, governmental bodies started to show great interest in these tools. The United Kingdom, the United States, and the European Commission launched research programs to support research on behavioral economics and public policy in the form of Behavioral Insights Networks (BIN). This lead to multiple cases where international governments successfully implemented interventions based on these concepts; for example, to promote putting money into savings accounts to deal with potential healthcare costs within the United Kingdom (King et al., 2013). Moreover, for various public health campaigns in the United Kingdom, nudge based interventions have been used to stimulate children and their parents to adopt a healthier lifestyle (Mulderrig, 2018).

In the Netherlands, there are numerous examples of policymakers using nudges in real life. For example, the obligated graphic warnings on cigarette packaging, labels for energy- or fuel-efficiency, "nutrition facts" panels on food, and default rules in the form of standard registration as an organ donor. For one of these implementations, scientists measured the impact of a new default choice on student loans. Before 2014 the application form had a maximum loan as a default. When the DUO removed this option, and students had to fill in the desired amount, the number of students applying for a maximum loan halved (Vasterman, 2015).

These implementations of nudges by governments show that there is a potential for using behavioral sciences within policymaking. These insights might be useful because, due to the Paris act, governments need to direct citizens towards a more sustainable lifestyle (United Nations, 2015). As mentioned before, traditional policymaking seems insufficient to activate citizens. Hence, governments became increasingly interested in the use of this behavior influencing tools as a driver for sustainable behavior. Therefore, the next section will focus on the application of nudges that aim to stimulate behavior.

Green nudge

Because of the successes of prior research and implementations of nudges, governments consider nudging as a potential enhancement of the current interventions for policymakers and enforcement, as a driver for sustainable behavior. Recently Cass Sunstein (Sunstein, 2015) claimed that nudges could be promising tools for promoting a broad range of pro-environmental and sustainable consumption behavior. These interventions target the reduction of water in India (Economist, 2017), electricity consumption in Ireland (Cosmo & O'Hora, 2017), and the stimulation of traveling by public transit instead of a personal vehicle (Byerly et al., 2018).

Results revealed that people were willing to pay more for utilities, offering sustainable energy, when it was set as the default choice. Here, economic incentives are absent, and the opportunities have not changed; only the choice landscape changed. The experiment suggests that people do not like to consciously choose a cheaper unsustainable option, but instead stick to the default in general. These examples show that insights from the behavioral sciences are applicable for policymaking to stimulate sustainable behavior. The interventions are cost-effective and applicable on a broad scale to activate citizens. It seems logical that governments are going to use these tools to reach sustainability targets.

Knowledge gap

An extensive literature study by VANG aimed to reveal potential interventions to stimulate fruit and vegetable waste separation (VANG, 2020). While searching for potential interventions to stimulate fruit and vegetable waste separation, they found the Foot-in-the-Door (FITD) to be a driver for sustainable behavior in multiple studies (Guéguen et al., 2010; Sébastien Meineri & Guéguen, 2008).

Even though the report suggested this tool as a potentially successful intervention, policymakers never followed up on this advice by running a pilot with the FITD in a real-life case. Thus, it remains unknown whether the FITD indeed could be a driver for fruit and vegetable waste separation, and it is useful to explore the potential use of the FITD within policymaking.

Besides the practical knowledge gap, there are some concerns related to how governments should use these tools to steer people. Within the available scientific literature on nudging, a concept that is often part of the discussion on legitimacy is the transparency or opacity of nudges (Nys & Engelen, 2017; Sunstein & Reisch, 2018b). By not being transparent about the intention to influence the individual choice, people might perceive them to limit them in the freedom of autonomous actions and decisions. Transparent nudges are a condition for ethical deployment, and people should be aware of the presence of nudges (Thaler, 2015). As for most nudges, they mainly target the automatic and subconscious cognitive process, and will probably not be transparent to the nudged individual (Hansen & Jespersen, 2013).

The absence of transparency would imply that the implementation of most nudges is not legitimate. The currently available FITD experiments confirm the suggested absence. Experiments used suspicion checks to identify individuals that understood the experiment and excluded them from all analyses (Arnold & Kaiser, 2018; Whatley et al., 2016). Nevertheless, scientists never attempted to make people aware that researchers or policymakers try to steer them towards sustainable decisions with the help of the FITD technique. Thus, besides the lack of knowledge about the effectivity of the FITD as a driver for fruit and vegetable waste separation, it remains unknown how transparency affects the nudge.

Therefore, this thesis aims to reveal if governments could use the FITD technique, transparently, as a driver for fruit and vegetable waste separation. The main research question of this thesis is:

"Is a transparent Foot-in-the-Door behavior influencing intervention an acceptable and effective driver for fruit and vegetable waste separation?"

To be able to acquire new insights related to the research question, this thesis addresses the following three sub-questions:

- **Is the FITD technique an effective driver for fruit and vegetable waste separation?** By exploring the features of behavior influencing tools, the existing (practical) knowledge, the potentials of implementing behavior influencing tools as a driver for fruit and vegetable waste separation will become apparent. Based on this information, it becomes clear if and how the FITD could stimulate fruit and vegetable waste separation. The experimental part will help to observe if the FITD indeed is a driver for fruit and vegetable waste separation.

- **Do citizens accept FITD as an intervention to stimulate waste separation?** After identifying the information and essential characteristics of the behavior influencing tools, this part reflects on the desirability of regulatory implementations. It will do so by reviewing the current knowledge about potential flaws, pitfalls, or concerns related to the implementation of these tools. These aspects are the basis of the experiment and to review the obtained results within this thesis.

- **Does transparency affect the effectiveness and acceptability of the FITD intervention?** Scientists and the inventors of nudging opted that transparent communication about the use of behavior influencing tools by governments deals with most of these ethical deployment concerns. Nevertheless, there is little scientific knowledge available about how transparency affects a nudge. Therefore, this part reflects on the current knowledge related to transparent behavior influencing tools and how transparency could increase the legitimacy of governmental nudges. Then for the first time, transparency is part of the FITD to observe how it affects the nudge.

A literature study and experiment will address these three sub-questions. Figure 1 displays the research flowchart.

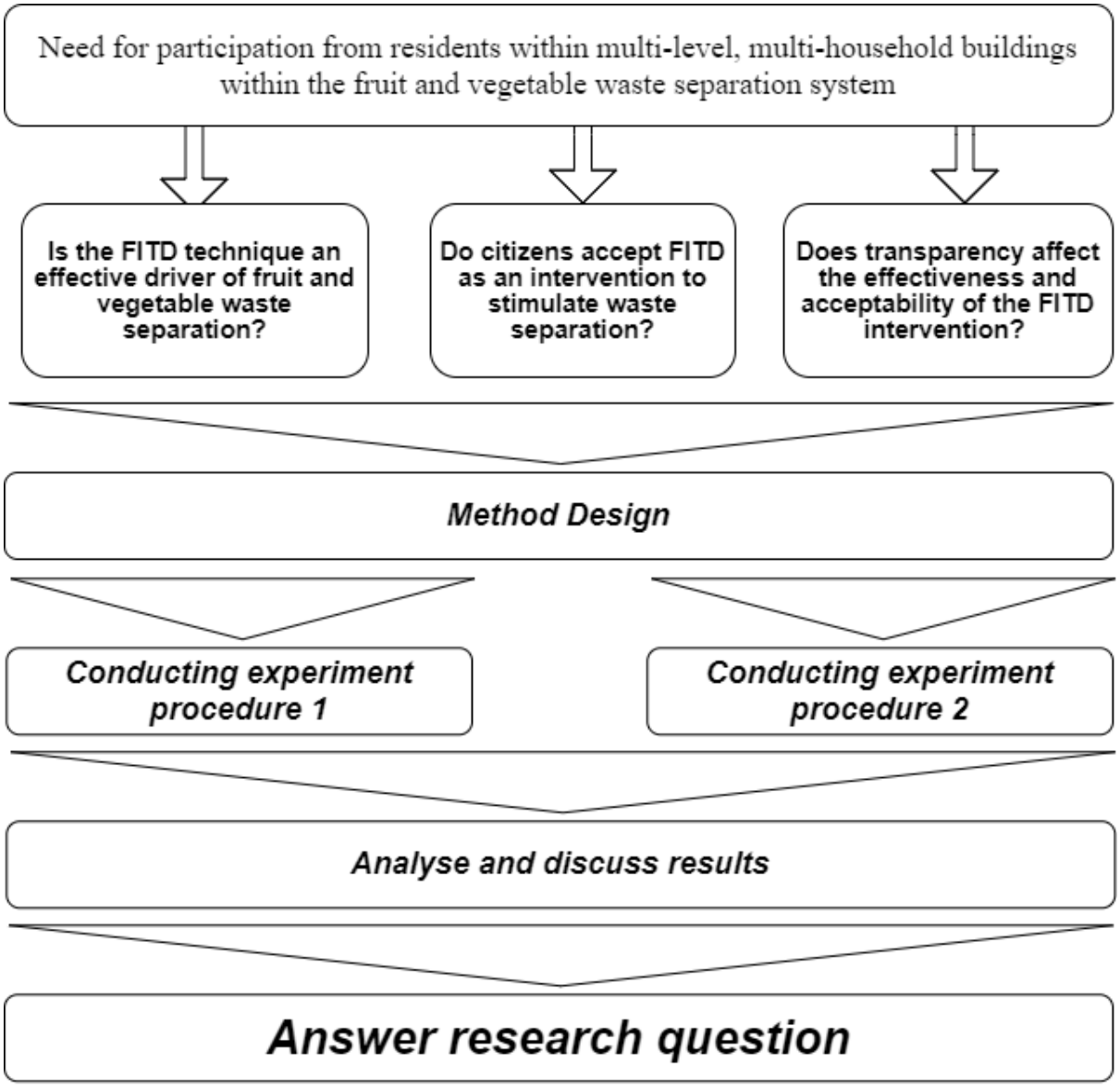

Figure 1: Research flowchart

1.1.1 Societal relevance

The benefit of a successful implementation of fruit and vegetable waste collection systems would be the reduction of citizen's environmental impact. The agricultural sector uses water to grow crops and emits greenhouse gasses during the production and transportation of the vegetables. If we use the materials more efficiently, the lifetime becomes longer. Increasing the amount of separated fruit and vegetable waste reduces the overall impact of this industry. Considering our current water and climate change problems, improving the fruit and vegetable waste management system could have a significant positive impact on future generations.

Furthermore, using the compost originating from food and garden waste is beneficial for agriculture. It improves the natural water management of the land, biodiversity, and fewer nitrates and phosphates pollute the groundwater surrounding the (Ye et al., 2016). Using compost, allows the soil to soak up more water. As a result, crops need less artificial watering. The reduced sweet water usage is becoming increasingly vital since we face an increasing number of droughts.

Besides the reduced environmental impact of food consumption, the implementation of a successful waste management system reduces the costs of the waste management system. The average cost for residual waste incineration is over 140 euros per ton. Some of these collected materials are even worth money; paper, cardboard, and glass have a positive value.

The government could sell these fractions to the processor to reduce the costs of the waste management system. Used paper is worth 60 euro per ton for municipalities (prijslijsten.eu, 2019). Moreover, the cost of food and garden waste treatment is 50 euros per ton and significantly lower than the residual waste treatment. Hence, separating waste and therefore reducing the total amount of residual waste will lower waste treatment costs. The inhabitants pay these costs, and therefore, a reduction of the expenses related to fruit and vegetable waste management system will benefit society.

Moreover, the potential effect of collecting more and higher quality household organic materials, the field of nudging is not unconditionally harmless for inhabitants. Governments are just becoming better informed by insights from behavioral sciences. New insights about the transparent use of the FITD might lead to higher approval rates from citizens towards steering by governments. Also, it appeared that policymaking that uses behavior-changing interventions are often more cost-effective compared to traditional policies (Benartzi et al., 2017). The high effectivity, broad application, and low costs result in a reduced need for tax money to pay for the implementation of these new policies.

1.1.2 IE relevance

Industrial Ecology is a scientific field that takes a systemic approach to sustainability problems, integrating a technical, environmental, and social perspective. The IE program at the TU Delft and Leiden University tries to deal with complex challenges related to sustainability. Nevertheless, it has a stronger focus on the technical and engineering side. Industrial ecologists should recognize the significant importance of social sciences within this field of study since social sciences are at least as vital as the engineering side to tackle climate change issues. Moreover, it becomes clear that although governments often recognize the technical and ecological significance, within these large implementation projects, they seem to fail to activate people on a large scale.

2 THEORETICAL FRAMEWORK

The first part of this theoretical framework aims to show why advisors and policymakers suggested the FITD as a potential driver for fruit and vegetable waste separation. It does so by evaluating the mechanism behind compliance-based tools. Next, there is a presentation of examples of successful experimental FITD setups and experiments as a promotor of sustainable behavior. The second part of the theoretical framework aims to further elaborate on why the acceptability of policies is essential. Moreover, it will present, based on earlier studies, how citizens perceive nudges. Moreover, this part will reflect on the potential effect of perceived manipulation and potential harm in unaccepted policy measures.

The final part will reflect on the current lack of knowledge about the effect of increasing the transparency of nudges. The first section will elaborate on the desire for transparency. Next, this part interpreted the limited amount of scientific research. This information is useful for the design of the experimental setup and allows the forming of expectations. Moreover, it provides some context, useful for the evaluation of the results, and to place them into perspective.

2.1.1 Is the FITD a driver for fruit and vegetable waste separation?

Compliance

Scientists suggested the FITD, a compliance-based nudge during preliminary research as a potential driver for fruit and vegetable waste management within stacked buildings (VANG, 2017). These tools aim to let a participant deliberately comply with a small prior request or deny a significantly larger prior request before confronting a person with the target request. Compliance refers to accepting a request. When people face a prior request, their choice landscapes for the final request changes, making it more likely they will accept the final request. The preliminary request might either be explicit or implicit. However, the targets should recognize that for the preliminary request, they should respond in the desired way (Cialdini & Goldstein, 2004).

Scientists observed the effectivity of the behavior influencing tools in the past few decades. Multiple meta-analyses of numerous compliance-based intervention studies have shown the effect on compliance rates related to large requests (Beaman et al., 1983; Burger, 1999; Dillard et al., 2006; Fern et al., 1986; Pascual & Guégen, 2005). Burger's meta-analysis summarized six processes that potentially change an individual's attitude towards the target request after complying with an earlier request (Burger, 1999).

The psychological mechanisms identified in this research on compliance based nudges are self-perception (Bem, 1972), reciprocity rules and reactance (Fogarty, 1997), norm conformity (Cialdini et al., 1991; Schultz et al., 2018), attribution (Weiner, 1985), and consistency-commitment theory (Vaidyanathan & Aggarwal, 2005). Table 1 shows the mechanisms and how they affect compliance. These psychological effects can either be positive or negative.

Table 1: Psychological mechanisms affecting compliance rates

Psychological process	**How it affects the effect of compliance**
Self-perception	Enhances the effect
Reciprocity Rules and Reactance	Reduces the effect
Conformity to the norm	Reduces or enhances the effect
Attribution	Reduces or enhances the effect
Consistency needs	Enhances the effect
Commitment	Enhances the effect

Compliance can either be private or public (Whatley et al., 2016). Private compliance refers to a situation where a person does not express compliance with a request publicly. An example would be asking people to complete a survey anonymously. Behavioral experts often use the self-perception theory to explain the physical mechanism behind the private agreement. Once an individual complies with the initial request, it is human nature to be consistent. Thus, people feel the need to be consistent with the first compliance. After accepting a request, a person likes to think that they are the type of person that complies with these kinds of requests.

If a participant complies publicly, another mechanism occurs. Public commitments refer to compliances that are publicly visible. The placement of a sticker with a statement visible for people passing by is an example of how policymakers or scientists could request public commitment. These commitments tend to be more persistent than private engagements (Cialdini & Trost, 1998). The fear of losing face towards peers often explains the effect of public compliance. Individuals are more likely to remain consistent with peers. As a result, an individual anticipates taking pride following public approval (Whatley et al., 2016).

Compliance is an automatic generic behavior, and policymakers can use it as a helpful tool targeting a diverse group of citizens. In general, researchers find the technique to be simple, secure, and cost-effective to perform (Burger, 1999). Multiple influencing tools originate from this principle. There is an extended list of compliance-based tools, but scientists studied the door-in-the-face (Cialdini et al., 1975) and the FITD (Freedman & Fraser, 1966) techniques in more detail.

Both use the psychical mechanisms triggered by confronting the participants with a preliminary request. The door-in-the-face technique has shown to be effective in multiple cases. This tool uses a large preliminary request, which a person is likely to decline, to increase the chance they comply with the target request. This technique works best if the target request is made immediately after declining the first request (Cialdini et al., 1975).

The FITD technique is a method based on the effect of compliance. Once a person complies with a small request, it is more likely that the person complies with the more significant request, and it becomes harder to decline a target request. Due to earlier successes with a FITD as a driver for pro-environmental behavior stimulation (Guéguen et al., 2013; Katzev & Johnson, 1983; Maya Dufourcq-Brana, 2006; Vaidyanathan & Aggarwal, 2005), the emphasis within this thesis will be on the latter technique.

Foot-in-the-door

Freedman and Fraser introduced the useful behavior influencing tool in 1966 (Freedman & Fraser, 1966). In their study, a group of women in California received a call by telephone, and the researchers asked them if they were willing to answer a few questions about household products they use. Three days later, the researchers called the participants again and asked if they would be willing to allow five or six male investigators into the participant's house as a part of a 2-hour on-site household product consumption research.

They convinced 43% of the participants to allow a team of investigators to perform a field-study inside their homes for two hours. Another group of participants received the target request immediately, and only 22% of them agreed to the large request (Freedman & Fraser, 1966). This investigation, for the first time, demonstrated the effect of a foot-in-the-door. Although there is still a scientific debate regarding these mechanisms responsible for the outcome, most of them agree that consistency and commitment are dominant drivers. Because our society appreciates consistency, people have a powerful desire to appear and be consistent.

In the earlier introduced meta-analysis on the FITD technique, Burger argues that the earlier request should be in line with the target request to enhance the effect (Burger, 1999). Introducing a preliminary request that is in line with the target request performs pressure on the subject to perform future actions that are consistent with the initial expressions (Cialdini, 2001). Furthermore, statements that allow participants to express a positive attitude towards the target request strengthen the impact, as observed within multiple scientific experiments (Arbuthnot et al., 1976; Guéguen et al., 2013).

FITD as sustainable behavior driver

Over the years, FITD experiments in similar setups as the original study by Freedman have shown to be a useful tool to steer people. Especially in the direction of sustainable behavior. In one scientific experiment, to steer individuals towards sustainable consumption, scientists asked participants to express the attitude towards an environmental issue. The researchers asked participants to fill in a small questionnaire about rainforest protection. In this survey, the researchers formulated the questions in such a way that there is an increased likelihood that the participants expressed support for rainforest protection.

Directly after announcing a positive attitude towards rainforest protection, a sales agent involved in the experiment, showed the participants an advertisement for a sustainable product. As a part of the experiment, the participants became aware of the benefits of buying durable goods. In this case, the seller donated a share of the revenue to protect the rainforest. The study found that people were more willing to buy the product and to donate a higher amount of money compared to the control group that did not receive the FITD treatment (Vaidyanathan & Aggarwal, 2005).

Also, researchers used the FITD tool to prompt people for a reduction in energy consumption successfully. The success was, for instance, shown within an experiment in Dijon, France. Here within the preparatory task, researchers asked participants to express the attitude towards the environment with a preparatory questionnaire (Souchet & Girandola, 2013). After the initial survey, the participants had to respond to statements about energy savings. Compared to the control group, participants were increasingly willing to adopt the new behavior.

In another experiment, researchers asked homeowners to reduce electricity consumption by 10% (Katzev & Johnson, 1983). In the foot-in-the-door treatment, researchers conducted a preliminary short energy conservation questionnaire. Followed by this initial treatment, throughout three months, the scientists monitored the electricity consumption of the homeowners. They found that within the control groups, a survey or merely the conservation request had a minor effect and that the homeowners in the FITD experiment consumed less electricity compared to the control group.

The desire for consistency within the FITD setup becomes ever more apparent with another study in Switzerland. Here the researchers used the FITD technique to study the willingness to reuse towels in hotels (Terrier & Marfaing, 2015). During the check-in of new hotel guests, the host asked to accept a card, stating that the guests in this room reuse them during the stay, and hang it on the bedroom door. By doing so, the guests show that they support towel reusage.

Here the small preliminary request was to attach the tag to the hotel room door. The more significant target request was to reuse the towels instead of getting new ones every day. The commitment strategy revealed to be effective, even though guests rarely performed the task of the actual act of hanging the tag on the door. Another experiment shows comparable results to the towel reusage experiment. This experiment revealed that the actual performance of the preparatory task is not mandatory to create (Cialdini & Goldstein, 2004).

These examples clearly show that there are opportunities to drive residents to perform a sustainable action with the FITD behavior influencing tool. Based on this information, it is likely that the FITD is an effective driver for fruit and vegetable waste separation. However, they do not provide insights if governments could apply them to stimulate fruit and vegetable waste separation. Moreover, the public acceptability of using nudges to enforce policies is unknown. Therefore, in the next section, exploration of the current knowledge about the desirability of governmental nudging will take place.

2.1.2 Do citizens accept FITD as an intervention to stimulate waste separation?

This section evaluates the current knowledge about the acceptability of nudges. First, it will present the arguments of people who are pro and con nudges. The next part reviews the importance of the acceptability of interventions, and the potential factors affecting the acceptability. This part answers the question about how acceptable the use of nudges is, and what factors might affect the acceptability rates, from a theoretical point of view.

Pro nudging

Pro-nudgers believe that governments, in the current form of policymaking, are not less paternalistic or steering, but in most cases, less effective than governments that incorporate behavioral sciences within policymaking (Kasperbauer, 2017). Some argue that, especially with green nudges, since they are in line with one's character or accordance with almost anyone, they hardly ever compromise people's autonomy (Loewenstein et al., 2014; Nys & Engelen, 2017; Schubert, 2017). Others argue that nudges are needed to activate people and not wrong because nudges only change the choice landscape; they do not steer towards an option that was not there before (Momsen & Stoerk, 2014). Moreover, most nudges are reasonably easy to understand, and they do not seem to raise any fairness concerns because they are used uniformly (Croson & Treich, 2014).

Furthermore, multiple national surveys showed that the majority of citizens approve of most of the nudges presented to them (Loewenstein et al., 2014; Reynolds et al., 2019; Sunstein & Reisch, 2018b; Sunstein et al., 2019). Generally, industrialized western democracies approve nudges, as long as they fit the interest and values of most citizens, and the need is obvious (Sunstein & Reisch, 2018a). The questionnaire used in Reynolds' study contained questions about the acceptability of multiple hypothetical interventions that target a variety of behaviors. The interventions focus on actions that most citizens perceive as wrong, such as smoking and drinking. The study found that people that smoke cigarettes, in general, tend to find measures against smoking less acceptable, as compared to non-smokers.

Moreover, the metareview by Sunstein about governmental nudges reveals a couple of correlations between demographics and the public acceptance of behavior influencing tools. Firstly, women found nudges more acceptable, as compared to men (Diepeveen et al., 2013). Secondly, older people approve the use of nudges by governments more often. The final correlation is that higher educational attainment correlates with a lower approval rate towards nudges on average (Sunstein et al., 2019). Also, the researchers observed that acceptance is higher on average when a nudge targets someone other than the respondent.

Also, researchers revealed that there is a relation between acceptability and political trust (Osman et al., 2018). They found this relation by interviewing participants about how much they trusted the source of the policy measure and combined this information with the perceived acceptability. The more the respondents regard the entity proposing the intervention as trustworthy, the higher the acceptance rates were. However, the field of researching the acceptability of governmental nudges is young. Therefore, scientists have only been able to test a limited variety of nudges and target behaviors, and it remains uncertain how the acceptability and effectivity of a nudge are related.

How the acceptability could affect the effectivity of the intervention

People tend to have a lower approval rate for nudges that interfere with their actions and choices, and trust plays a significant role. Researchers found that environmental policy measures have shown to be ineffective unless they are regarded as acceptable (Gowdy, 2008). They observed this relation when they compared the acceptability of implemented or proposed climate policies to their effectivity. This result implies that if citizens regard policies as inappropriate or interfere with peoples their decisions, they might be less effective.

Residents could perceive nudges as manipulative. This effect became apparent in a Dutch experiment, where researchers introduced different frames about Carbon Capture Storage (CCS) to students (Gerdien De Vries et al., 2016). Framing messages in different manners is a form of nudging, potentially affecting behavior and the attitude towards a subject (Chong & Druckman, 2007). Researchers made the source of the information distributed to students was a newspaper or an oil company. The researchers designed the information as pro-CCS (where the news within the article was mostly positive), neutral, or negative towards CCS.

This study showed that the students perceived framing as manipulative, unconditional of how hard the researchers steered them towards a direction. Also, the researchers observed that participants perceived the information from newspapers as manipulative. They found the framing, more illegitimate compared to the situation where people expect a company to manipulate people.

Moreover, during the same experiment, researchers founded a theoretical framework called the Boomerang model (Gerdien De Vries, 2017). Framing based nudges threatened the free choice of individuals to support or oppose a policy. The underlying psychological mechanism is that an individual feels manipulated into supporting a technology when presented with a positive frame, leaving out the negative information.

As a result, nudges lose effectiveness once an agent feels manipulated. Moreover, the negative attitude towards a nudge might result in unattended efforts to reestablish freedom (Dillard & Shen, 2005). Consequently, people may try to restore liberty by precisely showing the undesired behavior. As a result, people could deviate from the designed intentions in the long-term.

This effect was also observed in real policy implementation, where the Netherlands changed its donor registration system. The policymakers designed the initial donor register as an opt-in. If an individual did nothing, he or she remained off the donor list. However, by changing the default option to opt-out, a significant group felt that the steering interventions took away the freedom of choice, while in the end, the options remained the same (Visser, 2018). This perceived limitation of freedom resulted in a group of citizens that tried to restore their liberty, and it led to negative attention for the government. Hence, fewer donors registered as a donor during the transition period. Also, the group of individuals actively choosing not to become a donor grew significantly.

This part reflected on the potential factors that affect the approval rates of governmental nudges and how the acceptability could affect the effectiveness of the behavior influencing tools. In general, people regarded nudges as acceptable, but gender, age, political trust, and expectations affect acceptability. Furthermore, policymakers should always prevent that citizens perceive nudges as manipulative because it might lead to undesired reactions. This information is useful to reflect on the results related to the acceptability of green nudging by governments. The next part will discuss if governments could be more transparent about the use of nudges as a policy tool to increase the legitimacy and to make the implementation more effective.

2.1.3 What is the effect of increasing the transparency of nudges?

The last part of the theoretical framework will discuss why policymakers should consider transparency, the currently available knowledge, and how transparency might affect nudges. Besides the public acceptability, governments often do not consider the ethical deployment of nudges. During the start of the project, I organized multiple dialogues with employees of the Rotterdam municipality to explore how policymakers currently use nudges. They are becoming increasingly interested and are using them more often. Nevertheless, they never considered the legitimacy of using these tools.

Nudges are often being subtle and covert, and scientists criticized them as being unethical. Because most of the nudges implemented during these experiments and within policymaking lack transparency about the intention to individual choice, citizens might perceive them as manipulative. Moreover, the current empirical research on this issue is scarce. Some studies are available, and these aimed to address if a could be more transparent and how it might affect the effectivity of a nudge. These experiments focused on changing the default choices of decisions (Bruns et al., 2018; Loewenstein et al., 2014; Steffel et al., 2016).

Presenting a default option is known to influence decisions. Within the first study, researchers investigate whether nudges can be made transparent without limiting their effectiveness (Bruns et al., 2018). They conducted a laboratory experiment where they try to stimulate carbon emission reduction by introducing a default value. The researches presented the maximum reduction as the default choice and presented information that the participant's decision-making might be affected because of this. Nevertheless, participants were more willing to reduce the carbon emissions compared to the control group.

The second experiment aimed to influence decision making for a hypothetical medical treatment. Participants received a disclosure, informing about medical treatments at the end of life stage. Next, researches asked which medical treatments they favor if they are too ill to make their wishes clear later. The researchers selected a default selection that was most desired by doctors. They informed people about the presence of default options before they completed the survey to observe if participants wanted to revise their selection. However, the researchers observed that as many participants chose the default option.

Both studies observed that the effect of the defaults persisted, despite the transparency. Therefore, it seems reasonable to incorporate transparency for all nudges. Nevertheless, due to the limited amount of experiments, and the fact that they only focused on the default nudge, it remains uncertain whether transparency affects the FITD if governments use it to promote waste separation. Moreover, these studies provided information before the nudge took place. Therefore, further research is needed, and a new experimental FITD intervention design, incorporating transparency, might lead to new insights within the field of transparent behavior influencing tools used by the government.

This last part of the theoretical framework reflected on the lack of transparency within the current nudge-based policy measures/scientific experiments. Moreover, it presents the currently available literature and identified a scientific knowledge gap. Besides, the review also showed that available studies never measured how transparency affects the acceptability of the tool. Based on the acquired information, the knowledge gap related to transparent nudging occurred, allowing the researcher to design the experiment.

Summary theoretical framework

In conclusion, scientists used the FITD successfully to steer people towards more sustainable decisions. Besides, most citizens approve nudges used by governments. Nevertheless, some studies revealed that some nudges might be perceived as manipulative by some individuals if it interferes with their autonomy. Moreover, for the ethical deployment of nudges by policymakers, they should be as transparent as possible, and transparency did not affect the effectiveness of the nudges. Nevertheless, it remains unknown if the FITD is a driver for fruit and vegetable waste separation and how transparency affects the effectiveness and acceptability of this specific tool.

Therefore, this thesis will, for the first time, incorporate transparency within the FITD behavior intervention to see if indeed the tool remains as effective. The experiment will also focus on how transparency affects the acceptability of the intervention. It will contribute to the topic of the use of nudges by policymakers. The experiment will contribute to a better understanding of what the effect of using transparent nudges is and whether policymakers can make nudges more transparent without the loss of effectiveness.

3 CASE STUDY CONTEXT

The incentive for improved waste management systems

New European legislation on waste separation will become active from 2024 onwards (Rijkswaterstaat, 2016). These regulations state that governments should provide the opportunity to all households to hand in all waste streams separately (European Parlement, 2018). The European parliament introduced these regulations because when textile, organic, paper, and glass materials become part of mixed residual waste, the waste fractions contaminate each other (Weenk, 2017). Once mixed, recyclers cannot reuse or recycle the materials anymore. Therefore, if residents are not able to separate the materials at the source, these materials are lost (Kumar et al., 2009).

Nevertheless, households still do not separate materials enough. Within the Netherlands, citizens only separate 58% of all the residential waste (CBS, 2019). However, in highly urbanized cities, such as Rotterdam, a significantly lower amount, 28% of the waste is separated (CBS, 2018). As a result, policymakers need to change/enhance current waste management systems. Countries like the Netherlands and individual cities introduced transition programs. These aim to introduce new waste management strategies to improve the quantity and quality of yielded residential waste materials (Gemeente Rotterdam, 2019b; Rijksoverheid, 2016).

Why organic waste, specifically?

To identify potential improvements to the current system, Rijkswaterstaat performed waste analyses (Gemeente Rotterdam, 2019a). This analysis revealed that food and garden waste are currently responsible for at least one-third of residential waste (Rijkswaterstaat, 2017). Moreover, in highly urbanized areas such as Rotterdam, 40% of the household residual waste exists out of food and garden waste, as shown in figure 2 (Gemeente Rotterdam, 2019a).

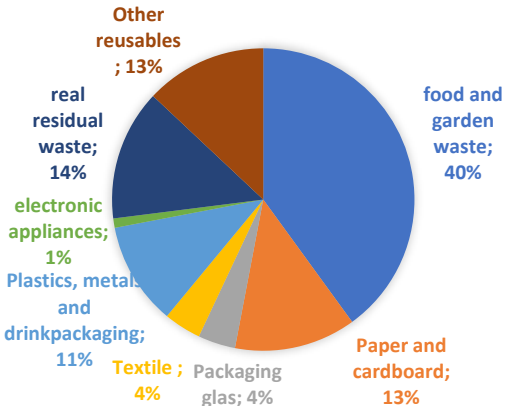

Figure 2: Residual waste analysis municipality of Rotterdam

Furthermore, research within the United Kingdom found that the overall impact of avoidable food waste by households ranges from 2000 to 3600 kg CO2-eq per ton (Tonini et al., 2018). These significant amounts of emissions are preventable if humans can recycle organic materials. There are facilities that compost fruit and vegetable leftovers directly or via an anaerobic digestion facility to produce biogas. With this process, the residue becomes available as biological fertilizer.

After the treatment, people could use the compost as soil nutrition. Compost has multiple benefits compared to animal manure, which is currently used (Evanylo et al., 2008). However, there are strict regulations regarding the quality of collected organic material (Stenmarck et al., 2016). These are necessary because plastics, glass, and other pollutants could be harmful when reused as food or recycled to compost in agriculture (Lammers, 2018). If collected fractions are too impure, incineration is the only option. Incineration allows the recovery of energy, although it results in a loss of valuable nutrients. Considering the large fraction of organic waste within the residual waste and the overall impact related to it, separated treatment of fruit and vegetable waste is essential.

Multi-level buildings

Therefore, policymakers investigate the opportunities to improve infrastructure and separation behavior at the source. These studies observed that residents that live within a multi-household produce a significant amount of extra waste compared to citizens in low-rise buildings within the Netherlands (designinnovationgroup, 2015). Moreover, case studies within the Netherlands revealed that there is a linear correlation between the urbanization level and the extra residual waste they produced (Odegard et al., 2015).

These studies revealed that residents living in multi-level and multi-household buildings produce an extra 150 kg residual waste per year per person on average (Gemeente Rotterdam, 2019a). The infrastructure might, to a considerable extent, explain the difference in waste separation rates and why it is more difficult to activate these residents. Citizens living within these buildings do not have access to a container inside the building. This absence is the result of challenging logistics and the lack of space. Contrary to high-rise buildings, low-rise households have a private mini container that is collected by the municipality (VANG, 2017).

Researchers found during a national survey that residents within the Netherlands are less willing to participate in the separated waste management system if it requires a significant amount of extra effort, and they perceive barriers (Parre, 2020). Within the study, people pronounced that they were willing to separate waste but did not want to bring it to the disposal facilities in public spaces. Since it is not possible to provide a container within these buildings and therefore the predicted participation rates are low, introducing fruit and vegetable waste management systems have long been out of the policymaker's scope.

This relation between the effort and willingness to act was also introduced within research related to the barrier perceived by homeowners to make their houses more sustainable ((G. de Vries et al., 2019). The researchers introduced a theory that the accumulation of perceived hassle when someone wants to make houses more sustainable, can lead to considerable stress and inaction. Thus, perceived barriers affect the potential effectiveness of waste management systems.

Also, indoor physical barriers are present, distinguishing multi-household from low-rise buildings. The limited amount of space, due to small kitchens and a lack of space for waste storage, negatively affects predicted participation rates (Midden, 2015). Besides these physical hurdles, inhabitants experience psychological barriers within these buildings. A significant share of residents in a high-rise, multi-household buildings have less attention for general social norms compared to residents in low-rise areas due to lower social cohesion and higher anonymity (Gifford, 2007).

Nevertheless, the new European legislations require municipalities to start collecting the fruit and vegetable waste in high-rise buildings (European union, 2018). Therefore, policymakers will introduce a new waste management system and desires to stimulate the participation rates within fruit and vegetable waste management. Because it is more difficult to activate these citizens due to the barriers presented, nudges might play a crucial role in the success of this implementation. Hence, this thesis aims to reveal if the FITD is a driver for fruit and vegetable waste separation with a case study in Rotterdam.

4 METHOD

Table 2: Overview of variables

		Transparency condition: Yes	Transparency condition: No
FITD	Yes	FITD * Transparency	FITD
	No	Transparency	Control group

This study aims to determine if a transparent Foot-in-the-Door behavior influencing intervention is an acceptable and effective driver for fruit and vegetable waste separation. The case study was conducted at the municipality of Rotterdam and focused on how two variables, as presented in Table 2, affect the compliance and acceptability rates with the request to separate fruit and vegetable waste and to bring the collected material to a nearby community garden for one month.

This chapter will merely focus on the procedures used in this study. Due to the case study setup, several practicalities had to be arranged upfront. The context for the decision making for the practicalities, such as the study location and the material used within the method, can be found in the next chapter, “Context experimental design.”

General setup

For the experiment, a structured interview was designed. The researcher will use a script (Appendix I: Script FITD experiment) containing close-ended questions and explanatory notes. Each time, the statements, questions, and explanatory notes will be presented in the same order. The experiment will be conducted face-to-face and online.

Due to the structured setup, the questions and their exact wording were pre-decided, limiting the researcher bias for the interview, leading to consistency in both the methodology and the information gathered from all participants, resulting in comparable responses. Moreover, due to the limited response categories and deviation possibilities, faster execution is possible. This method allows the researcher to cover a larger audience during face-to-face meetings and to limit the time consumed from participants during an online experiment.

The two main variables researched in this study are the use of the FITD intervention and transparency. These are researched by using a single case study, replicating the classic FITD experiment (Freedman & Fraser, 1966) with an extra transparency variable added. This setup consists of a small preparatory questionnaire. If participants receive the FITD, the researcher asks the participant if he or she would agree to respond to a short 4-question survey related to fruit and vegetable waste separation.

FITD condition setup

The FITD preliminary survey used in this method (Appendix I: Script FITD experiment), consists of four statements, which the people can agree or disagree on, on a 5-point Likert-type scale. As introduced in the theoretical framework, the first request should be in line with the target request to enhance the effect of a consistency-based nudge like the FITD (Burger, 1999). Hence, the statements used within the experiment, focus on sustainable behavior and waste separation. The statements used within the experiment have shown to be factors that affect the probability, residents are separating household waste (Ekere et al., 2009; Graham-Rowe et al., 2015; Knickmeyer, 2019). This experiment merely uses these questions because they are in line with the target request and potentially can be useful while interpreting the results.

The researcher presented the following statements during the preliminary survey to people subjected to the FITD:

- *Statement 1: "People harm the environment with our current behavior."*
- *Statement 2: "I think it is important that other people see me as a sustainable person."*
- *Statement 3: "I think it would be beneficial for the environment if households separate fruit and vegetable waste from residual waste."*
- *Statement 4: "I think I can separate fruit and vegetable waste if I have the opportunity."*

The first and third statements aim to identify a person its attitude towards the role of humans in general environmental problems and towards the target behavior. The attitude towards this matter before the research might indicate if the target request is in line with one's character or accordance and if it does not compromise a person its autonomy. The second statement aims to reveal the presence of social norms. The final statement aims to what extent a person believes that he or she can perform the behavior.

Transparency variable

The second variable (with or without informing the participants about the nudge) aims to increase the transparency. Some participants are made aware that the researcher uses a method to influence the choices made later on. The available scientific literature related to transparent nudging, allowed the researcher to design the text for this part of the experiment (Bhargava & Loewenstein, 2015; Bruns et al., 2017; Steffel et al., 2016). The information provided, to increase the transparency, has a similar setup to the ones that already were successfully used during these types of experiments. It first briefly explains the mechanism behind the nudge, followed by the goal of implementing the tool. However, the text was tailored for this case-study. For the sake of readability, a translation of the quotes is given. For the original text, see appendix I. Participants receive the following information:

"This study uses a tactic tested before. It consists of a smaller and larger request; this can lead to you making a different decision. The goal of this study is to see if we can give people a little nudge in the right direction, hopefully with the result that people will separate fruit and vegetable waste."

Target request

After completion of the survey and/or receiving information about the nudge, the researcher thanked the participant and introduced them to the target request. For the sake of the readability, a translation of the script is presented:

"I have something (else) to ask you. There is (another) research related to fruit and vegetable waste separation at nearby community gardens. This research aims to make people separate their household fruit and vegetable waste and bring it to one of these gardens for one month. These gardens will use these materials for farming fruits and vegetables. Would you be willing to participate in this experiment?"

In the control condition, the researcher approaches participants in the same manner, but he only made the target request. If a participant complies with the target request, they receive information about the practicalities of the fruit and vegetable waste separation. For the sake of the readability, a translation of the script is presented:

"The community garden (…) is located (…) meters from your apartment at (…). To facilitate the fruit and vegetable waste separation, we distribute small kitchen containers to collect the fruit and vegetable waste and an information card. This information card contains the address and a list of compostable materials.

If the participant complies with the target request, the researcher hands out a small kitchen container for the fruit and vegetable material and information card (Appendix III: Information Card). The compliance rates will be determined based on the people complying with the target request, and not the actual performance of the desired behavior. This method assumes that all people that complied to separate the waste will perform the desired task. This method is less time consuming and more practical, compared to, for instance, measure the amount of waste separated or the number of visits to the community garden to dispose of the material.

Acceptability of the intervention

At the end of this experiment, the aim is to address the acceptability of the governmental behavior influencing tool. The researcher will ask participants how acceptable they perceive the use of the nudge by governments to stimulate fruit and vegetable waste separation in the following manner:

"How acceptable do you think the use of nudges by governmental bodies is, on a scale of 1 till 5?"

This formulation is similar to the ones used in earlier experiments focused on the approval rates of policy interventions (Reynolds et al., 2019). The measurement of perceived acceptability is on a 5-point Likert scale, allowing to observe different acceptability rates between varying conditions.

Participants selection

Research related to waste separation and the distance to the disposal facility revealed that with an increased distance, the barrier to separate waste increases (Mourad, 2016). Hence, for this case study, the researcher selected buildings in a range of 200 meters surrounding the Bloklandtuin (Figure 3) and a block 250m from the Vredestuin (figure 4) the research will take place within this proximity to limit the effect of distance to the disposal facility.

Figure 3: Bloklandtuin and surrounding buildings?

Figure 4: Noordmolenwerf, Vredestuin and crossroad between residents and the garden

Within this range, there are some privately owned houses, social rental buildings, and rental residences within the high-income sector surrounding the Bloklandtuin. For the Vredestuin study location, the target building is across a busy street (Figure 4). A variety of residents live in the multi-level, multi-household building. Most inhabitants are elderly and have been living in the same apartment for a significant period.

Procedure

The researcher, one 24-year-old male student, started at the beginning of March 2020. After the researcher recruited a couple of participants, the experiment stopped due to a virus outbreak. Hence, the initiative designed face-to-face procedure **(door-to-door)** became impractical. The Dutch government did not allow residents to have physical contact, travel around, visit each other, or be within 1.5 meters from each other. Therefore, the researcher redesigned the experiment to continue with the experiment online **(online)**. The online version has a similar setup and uses the same text as the initial experiment.

Both procedures end with a debrief. Here, participants are thanked; the goal of the experiment is explained; there is room for questions, and participants are informed that the experiment ended. It was decided to debrief participants immediately to reduce the number of contact moments.

Procedure 1

Within the door-to-door method, the researcher visited the participants within the research area and went by 55 households. From these households, fourteen were at home and opened the door, and seven people complied to take part in the experiment. The researcher assigned the first household to open, to the first condition, and the second household to open, to the second condition, et cetera.

After a potential participant opens the door, the researcher introduces participants to the research according to the script (Appendix I: Script FITD experiment). If they agree to participate with the research, the participants receive a preliminary survey if submitted to the FITD condition and informed about the nudge if they are within the informed group. Regardless of the conditions, the researcher asks each participant if they are willing to bring separated fruit and vegetable waste to one of the community gardens nearby.

The FITD works slightly better if there are some days between the small preparatory request and the target request (Cialdini et al., 1975). Nevertheless, immediate exposure to the target request has shown to be successful in various FITD experiments (Arbuthnot et al., 1976; Arnold & Kaiser, 2018; S. Meineri & Guéguen, 2014). Within this experiment, the citizens receive the target request immediately. Due to the time restrictions of this study, it was necessary to reduce the number of meetings and the labor intensity of the research.

Procedure 2

As mentioned before, the experimental setup changed since it was not possible to carry out the initially designed procedure anymore. There are several advantages to experimenting in an online environment. People can complete the experiment whenever it suits them. Moreover, it is easy to spread the experiment among a larger group, making it more time-efficient compared to the door-to-door procedure. Nevertheless, there is a limited amount of practical experience in conducting a FITD experiment online.

Only one study is available where researchers used the FITD behavior intervention online (Guéguen & Jacob, 2001). In that study, researchers asked participants to sign a petition form online (a petition for the respect of the antipersonnel-mines treaty), after which the participants were directed to a page asking for a donation to prevent childhood victims from mines. In the control condition, the participant was asked for a donation directly. The results from that study show that the FITD procedure increases compliance with the final request.

For the online experiment in Rotterdam, the participants participated in the experiment in an online environment through google forms (Appendix II: Online Google form). The example given represents condition 1, where all variables are present. The experiment consists of the same text and order of the text as to the first procedure. Participants were allocated by four different links to four different forms, representing the four conditions, and potential recruits were approached through the owner's associations of buildings nearby the gardens. The distribution of the experimental conditions differed per location because two different owners' associations communicated with the residents through varying manners.

First, the researcher contacted the Owners Association of the Noordmolenwerf building near the Vredestuin. The board of the Noordmolenwerf distributed the questionnaire through an email, but they excluded households that already took part within the earlier experiment with the physical attendance. The owners associations, randomized on the alphabetical order of the mailing list, send each condition to 15 households within the mailing list. Thus to 60 households in total.

The second target group is the residents of the 130-Watt building block near the Bloklandtuin. The residents of the 130-Watt buildings are living in higher segment rental houses; mostly, they are young parents living there with children. One of the board members of the 130-Watt association sends them a link to the experiment in two different WhatsApp groups, containing all 70 households within the building blocks.

However, there were only two separate WhatsApp groups; As a result, the board member distributed only two conditions (the FITD condition in 1 group, and the transparent condition in the other) to households within this building block with an explanatory note. After the survey and target request, the researcher distributes the small kitchen containers and information cards to the ones that complied with the target request.

5 PRACTICALITIES METHOD DESIGN

This chapter will focus on the practical side of the experimental setup. Various practicalities had to be prepared before the experiment took place. Firstly, the case study locations had to be selected. Secondly, the design of the disposal facilities was evaluated and improved. Thirdly, the script used during the experiment was designed carefully and tested before the start of the experiment. Finally, the small kitchen container needed to be selected and bought. The next sections will elaborate on the decision making related to these aspects.

Selection of case study location

Before the start of the experiment, the researcher prepared many practicalities during the exploration phase in January and February. Within this phase, the researcher visited the potential study locations within Rotterdam. The experiment will involve inhabitants of the city of Rotterdam, living near public gardens. Moreover, there were multiple interviews with the managers of the gardens, communication advisors, neighborhood social workers, and project leaders of earlier pilots. These informal interviews helped to design most of the practicalities related to the case study and helped to gain insights into the demographics and the practical side of the experiment.

Next, the researcher explored the potential study locations. Groengoed manages eight public gardens in Rotterdam in the Oude Noorden and Agniecebuurt and Provenierswijk. These locations have collection containers for the disposal of residual organic waste as a feed for their recycled compost (Groengoed, 2019). Citizens can use these containers to dispose of fruit and vegetable waste they collected separately within their households. After visiting the potential study locations, the researcher selected the best sites, based on the demographics, distance to the garden, and type of buildings surrounding the location.

For this thesis, the Bloklandtuin and Vredestuin have been chosen. These locations have been deemed most suitable for this experiment because the surrounding inhabitants do not have a personal organic waste container, collected by the municipality. Thus, inhabitants do not have another way to separate fruit and vegetable waste. Moreover, enough residents are living within a small range of the garden, limiting the research area, making it less time consuming and, therefore, less labor-intensive to go by the doors. Also, to make the study more comprehensive, the locations contain a variety of different demographic characteristics within a small area.

Redesign disposal facilities at the community gardens

For this research, the community gardens must have a suitable disposal facility for the fruit and vegetable waste collected by participants. Therefore, the researcher evaluated the current use of the disposal facilities and the design, provided information, and location of the collection bins. The gained knowledge obtained during the literature study allowed the researcher to evaluate and improve the disposal facilities in the garden. Moreover, informal interviews helped to reveal insights about the practical experience of the garden managers, the feedback on the information from the communication advisors, and the results of earlier pilot studies from project leaders within the municipality of Rotterdam.

During this evaluation, it appeared that the old basket was too small, placed out of sight, susceptible to pests, and people found it ugly and dirty (Figure 5). Moreover, the information provided at the location and the website of Groengoed was insufficient and too complicated. Some of the citizens living near the collection site were against the collection of fruit and vegetable waste separation. The garden manager mentioned that this negative attitude towards fruit and vegetable waste collection resulted from the fact that the containers were dirty and a potential stimulus of rat plagues.

Figure 5: Old collection basket

Figure 6: New collection container

Consequently, it was decided to relocate and redesign the disposal facilities and the information at the location and online. The goal of the renewed information and facilitation is to fit the needs of the residents. The improved design made the container less vulnerable for pests, more visible for potential new waste separators, and it appeared cleaner (Figure 6). Besides, the manager decided to make the information near the container and on the website less complicated. All these changes should make it easier to separate fruit and vegetable waste in these gardens.

Furthermore, with the help of neighborhood social workers, the preliminary research identified other projects that might interfere with the study. The manager of the community garden wanted to start a project to gain more attention to fruit and vegetable waste separation. Raising awareness for this cause might work as a prime for waste separation and interfere with the experiment. In consultation with the community, they delayed their project, in exchange for help and advice related to the implementation of the disposal facility within the garden. Hence, the researcher was able to make sure that the planned awareness program does not affect the experiment.

Script design and information card design

Interviews with the communication advisors and neighborhood social workers also helped to design the script used during the experiment. Also, communication advisors helped to adjust the readability of the text. The content of the script is similar to an earlier experiment where the FITD was used to stimulate the participation rates to separate waste for one month (Guéguen et al., 2010).

This study also took into concern the readability of the script because the content of the script should be clear for everybody. The questions are at a B1 language level or lower. That level should be understandable for 95% of Dutch speakers (Appendix I: Script FITD experiment) (Rethans, 2014). The text was evaluated with the help of a writing tool (Texamen language complexity evaluation). Consequently, measuring the impact of a FITD treatment is possible without excluding participants due to misunderstanding the information and questions.

To get a better understanding of the potential outcome of the experiment, the researcher designed a hypothetical experimental flowchart (Appendix IV: Research flowchart). The design includes all previously discussed aspects of the preliminary research. Next, there was a thought experiment and multiple trials with friends and employees at the municipality of Rotterdam. The preparatory work revealed that even if some participants opt-out, from a certain point, useful information becomes available. Moreover, it was possible to fix and improve potential flaws in the questionnaire during this process.

Selection small kitchen container

The small kitchen container is part of the experiment because it should make it easier for the participants to separate the fruit and vegetable waste. Earlier pilots found that vulnerability to a nasty odor, the need for biodegradable bags, the size, and dimensions are important parameters. This information led to the decision of a closed basket for this experiment. Also, the size and dimension of the container play a significant role. It should not become too heavy and not be too big because of the limited amount of space in most of the kitchens, and people do not want to go to the disposal facilities too often.

Figure 7: The small kitchen container

The researcher chose the 9L container presented in figure 8 for the pilot study. The municipality of Rotterdam purchased 40 mini containers for this pilot, based on this desk research. Together with some people living near the gardens, the researcher reviewed the basket during a preliminary trial. The small pilot with the basket revealed that they fulfill all the needs.

6 RESULTS

Recent research revealed the potentials of implementing the FITD as a driver for sustainable behavior. Preliminary research by the VANG, identified the nudge to be a potential driver for fruit and vegetable waste separation, and scientist successfully stimulated other sustainable behavior by using this tool. Nevertheless, policymakers never used it for this cause (Guéguen et al., 2010; VANG, 2017). Thus, it is unknown whether they could apply the tool for this problem, and if the citizens approve the policy measure.

Moreover, due to growing concerns related to the untransparent use of nudges by governmental bodies, it is crucial to identify if and how transparent nudges should be. Therefore, this research aims to reveal if a transparent FITD is a useful and acceptable driver for fruit and vegetable waste separation with a case study within Rotterdam. The first section presents some general remarks about the research and findings. The next part reflects on the effectiveness and approval of the tool as a driver for sustainable behavior. The last part evaluates, for both aspects, the effect of adding transparency.

General remarks

In total, 28 participants took part in this research (n=28). Eight participants agreed to participate in the experiment during the door-to-door procedure, and twenty replied during the online experiment. The researcher excluded two participants from the results because one participant already separated fruit and vegetable waste. The other participant did not finish the whole questionnaire. The researcher recruited six to eight participants per condition (Table 3). Thus, the small group and unbalanced gender and unrealistic age distribution, as mentioned within the theoretical framework, could affect the acquired results.

Moreover, for the online spreading of the experiment, only two different building blocks took part in the experiment. These blocks are the wealthier building blocks, as observed during the exploration phase before the real experiment. Nevertheless, policymakers and researchers could use the results as indications and preliminary results, aiming to spark the discussion for future studies, and preliminary advice.

During the door-to-door experiment, the researcher noticed that participants living inside these two building blocks, in general, had a more positive attitude towards sustainability-related interventions and the environment, compared to inhabitants living in the social housings. The positive attitude towards a target behavior might result in more participants complying with the target behavior (Gifford, 2011). Therefore, the unequal number of participants participating in both procedures might also affect the results.

Table 3: Overview distribution participants over the different conditions and procedures

	Condition				
	FITD*inform	FITD	Inform	Control	Total
Procedure 1	2	2	2	1	7
Procedure 2	4	6	4	5	19

The effectiveness of the FITD intervention

While evaluating the results related to the experiment, one must consider the general unbalanced distribution of different demographical characteristics and the limited number of participants. First, the total compliance of both procedures will be evaluated. In the experimental condition, where participants only received the FITD treatment, 50% complied with the target request, compared to 33% that complied with the target request in the control group (Table 4). These results show that as expected, the FITD, compared to the control condition, is a competent driver for sustainable behavior.

Table 4: Overview compliance rate and actual count per FITD condition for both procedures

Before or after Corona			Condition				Total
			FITD * Inform	FITD	Inform	Control	
Online Procedure	Compliance with target request	Yes	0 (0%)	3 (50%)	3 (75%)	2 (40%)	8 (41%)
		No	4	3	1	3	11
Door-to-door Procedure	Compliance with target request	Yes	2 (100%)	1 (50%)	2 (100%)	0 (0%)	5 (71%)
		No	0	1	0	1	2
Total	Compliance with target request	Yes	2 (33%)	4 (50%)	5 (83%)	2 (33%)	13 (50%)
		No	4	4	1	4	13

Though the absolute numbers are low, it is interesting to investigate the different compliance rates between the online and door-to-door procedure. Due to the virus outbreak, the study method changed. This situation created the opportunity for the first time to compare the effect of physical attendance during the FITD procedure.

This analysis revealed that there are indications for an inverted correlation between the overall compliance rates in the online and door-to-door procedure. Regardless of the different conditions, for the door-to-door method were seven participants participated (n=7), the compliance rate is 71%, and for the online procedure (n=19), the compliance rate is 41%. Thus, it seems that in general, more participants complied during the door-to-door method.

The difference might be due to the conformity effect (Asch, 1956). Conformity is a type of social influence involving a change in belief or behavior to fit in with a group. It might be because the online procedure is more anonymous compared to the door-to-door procedure, and these commitments tend to be less persistent than public engagements (Cialdini & Trost, 1998).

Also, the fear of losing face towards peers often explains the effect of public compliance. Individuals are more likely to remain consistent with peers. As a result, an individual anticipates taking pride following public approval (Whatley et al., 2016). Because of this, it might be more difficult to decline a request if a person feels like he/she should comply with the person in front of them. Also, rejecting the request might be more comfortable online when there is a distance between the researcher and the participant.

At first sight, it seems that for both procedures, the FITD seems to be a driver for fruit and vegetable waste collection, compared to the control condition. Moreover, the FITD is as effective during the online procedure as within the door-to-door procedure. While only one earlier research is known that applied the FITD in an online environment (Guéguen & Jacob, 2001), and the absolute numbers are low, it seems that the FITD indeed can be used online.

Acceptability of governmental nudging

During the experiment, participants expressed how acceptable governmental nudges are on a five-point Likert scale. On this scale, five means that the participants perceive the suggested measurement is acceptable, and one as unacceptable. In total, 65% (17 participants) of the participants thought governmental nudges were slightly acceptable or acceptable. The approval rates are similar to the results for other nudges presented within earlier researches (Loewenstein et al., 2014; Reynolds et al., 2019; Sunstein & Reisch, 2018a). These papers revealed that most citizens support the use of nudges by governments.

For further analysis, the different mean acceptability rates for the online and door-to-door procedure are compared for the group that received the FITD and the group that did not receive the FITD (Table 5) The mean acceptability indicates how acceptable a group of participants perceives the intervention on a scale from 1 to 5.

Table 5: Acceptability rate per procedure and FITD variable

Procedure	FITD	Mean acceptability on a scale from 1 to 5	N	Std. Deviation
Door-to-door Procedure	No	4.00	3	1.000
	Yes	3.50	4	1.000
Online Procedure	No	4.00	9	.866
	Yes	3.60	10	1.174
Total	No	4.00	12	.853
	Yes	3.57	14	1.089

Again, due to the small number of respondents, the results are unreliable but can be indications useful as input for future research. First, it seems that participants in the door-to-door procedure found the intervention as acceptable as the participants within the online group. Moreover, while looking into the acceptability rates in more detail, there are indications that participants treated with the FITD, regarded the intervention as slightly less acceptable. The participants subjected to the FITD rated the average acceptability of governmental nudge as (M = 3.6, SD = 1.1) and the participants that did not receive the FITD rated the intervention (M = 4.0, SD = 0.9). Though this difference is not significant, it might indicate that once the researcher used the nudge on the participant, they feel more manipulated and, therefore, less approve the intervention.

It is known that policy measures, lose effectiveness once an agent has a negative attitude towards it (Dillard & Shen, 2005). Within this experiment, the average acceptability amongst the complying participants (M = 4.0, SD = 0.8) was higher than the average acceptability of the individuals that decline the target request (M = 3.5, SD = 1.1). Though this difference is insignificant, it might indicate that the suggested relation between the acceptability and the effectivity of the FITD is present and indeed affects the compliance rates in this experiment.

Does transparency affect the effectiveness of the FITD intervention?

Within this experiment, the researcher made some participants aware of the nudge before the target request to make the intervention more transparent. The experiment includes this variable to observe if the increased transparency affects the effectiveness and acceptability of the FITD intervention. Some participants were informed after they completed the FITD survey, and some received information without receiving the preliminary survey, before confronting them with the target request. Again, the small number of respondents makes the results unreliable. Nevertheless, due to the unique setup of the experiment, potentially new observations can be made.

From the group that only received information about nudges used in policymaking, 83% of the participants complied with the target request (Table 6). This result indicates that informing people about the governmental nudges, without subjecting them to the nudge leads to a higher compliance rate compared to the control group. Potentially informing the participants might work as a prime for the target request. Nevertheless, no scientific studies are available to support this claim.

However, when people were informed after they received the survey that was part of the FITD, the increased compliance rates observed with the FITD intervention diminishes. Hence, it seems that the FITD intervention and added transparency, interfere with each other, and lead to the same compliance rate of 33%, as the control group. The small number of participants might cause this result, but potentially other factors might explain this outcome.

While looking into closely related research, the increased compliance rates by only informing participants and the diminished effectiveness while combining the FITD and transparency, at first sight, are unexpected. The evaluated scientific literature within the theoretical framework suggests that the compliance rate would not be affected by informing participants (Bruns et al., 2018; Hansen & Jespersen, 2013; Steffel et al., 2016).

Contrary to the experiment performed within this thesis, earlier studies, present the information to the participants before the nudging procedure. Hence, this experimental setup might have revealed the importance of the moment of informing the participants.

The main difference between earlier studies that increased the transparency of nudges and the experimental setup used within this thesis is the moment at which a participant is informed. Contrary to the currently available scientific literature, within the procedure used for this thesis, a participant might feel manipulated because the information is presented after the nudge procedure already started.

The information potentially increased the awareness of the presence of the nudge, causing participants to feel manipulated (Gerdien De Vries, 2017) and recognize that they are the target of the intervention (Sunstein et al., 2019). These aspects might cause the participant to perceive the intervention as less acceptable. Thus, the moment of informing participants might be vital to make a nudge transparent and, therefore, ethically sound, and effective.

As mentioned within the results related to the acceptability, lower acceptability might explain the lower effectiveness. Informing participants about the use of behavior influencing tools as a measurement to steer them, on average, lead to lower acceptability (Table 6). The difference in mean acceptability for all uninformed participants was ($M = 4.29$; $SD = 0.73$) and informed participants ($M = 3.17$; $SD = .94$) was significant ($t(24) = 2.49$; $p < .002$).

Table 6: Overview acceptability rates of the informed and uninformed participants

Procedure	Inform	Mean	N	Std. Deviation
Door-to-door Procedure	No	4.33	3	1.155
	Yes	3.25	4	.500
Online Procedure	No	4.27	11	.647
	Yes	3.13	8	1.126
Total	No	4.29	14	.726
	Yes	3.17	12	.937

Other observations

Also, the survey that was part of the FITD condition (n = 14) includes questions that might predict the participant's intentions towards a specific behavior (Appendix I: script FITD experiment). The researcher asked participants to rate to what extent they agreed to statements related to protecting the environment, fruit and vegetable waste separation, social norms and the perceived ability to separate fruit and vegetable waste, on a five-point Likert scale, where five stands for fully agree and one for entirely disagree.

The survey revealed that only for the perceived ability to perform the target request, there was a slight difference between the complying and declining participants (Table 7). This could indicate that people that feel like they can separate waste are more likely to comply with such a target request. For the attitude towards the environment, presence of social norms, and attitude towards the target behavior, there were no observable differences between the participants that complied with the target request and the ones that did not.

Table 7: Comparison of the level of agreement to a different statement between the complying and not complying participants

	Comply with the target request?	N	Mean acceptability (scale 1 to 5)	Std. Deviation
Attitude towards the environment (question 1)	No	8	4,63	,518
	Yes	6	4,50	,548
Presence of a social norm (question 2)	No	8	3,00	1,069
	Yes	6	2,83	,753
Attitude towards the desired behavior (question 3)	No	8	4,25	,707
	Yes	6	4,00	1,265
Perceived ability to perform the target request (question 4)	No	8	4,00	1,195
	Yes	6	4,83	,408

Furthermore, this research revealed that some participants contacted the researcher after the debrief, with questions, and to provide feedback about the experiment. These emails might indicate that the FITD results in commitment towards the goal and a long persisting effect. Moreover, citizens that did not participate in the experiment became aware of the opportunities to separate fruit and vegetable waste and wanted to take part in the waste management system.

People might have an increased motivation to separate the fruit and vegetable waste because they get personal satisfaction by doing one's part within a community (Young, 2013). Seeing other people separate their fruit and vegetable waste might change their attitude towards the target request and social norms. Nevertheless, due to the limited number of participants, it was impossible to observe such a relation.

Another explanation could be that residents were activated because new information occurred to them. A case study in Bangkok revealed that if people better understand the waste management system and trust the functionality of it, they become more likely to take part and separate waste within their household (Boonrod et al., 2015). In this case, it is apparent what happens with the material once it is brought to the garden. The waste is being used in the garden directly, to grow crops. Moreover, seeing neighbors separating the waste or having chats related to it could create awareness for the opportunity to separate fruit and vegetable waste in their neighborhood in the community garden.

7 CONCLUSION AND DISCUSSION

This thesis seeks to find if a transparent Foot-in-the-Door can be a driver for residential fruit and vegetable waste separation. The study replicates the classic FITD to observe if more participants comply with the request to separate fruit and vegetable waste when they answer a small survey before the target request. Moreover, transparency is added to the experiment to observe how transparency affects the effectiveness and acceptability of the intervention. However, due to the small number of participants, the results can be unreliable.

Is the FITD technique an effective driver for fruit and vegetable waste separation?

The first sub research question aimed to find if the FITD is an effective driver for fruit and vegetable waste separation. The results show that when participants received a small preliminary request, followed by the target request to separate fruit and vegetable waste, the compliance rates increased. The FITD intervention led to higher participation rates compared to participants that did not receive the nudge. Based on the results, it seems that the FITD might be a useful tool to stimulate residential fruit and vegetable waste separation.

This research, for the first time, compares two procedures for applying the same FITD intervention, an online and a face-to-face setup. It appeared that the procedure where the researcher went door-by-door to apply the intervention was as effective as the online procedure. This observation is of added value for the current scientific knowledge because the knowledge related to the application of the FITD in an online procedure is scarce. However, due to the small number of participants and a limited amount of reference material, conformation of the similar effectivity is needed. Therefore, future research should further dive into the comparison of different setups for the FITD intervention to reveal the most efficient method.

It might be interesting for policymakers to reveal the effectiveness of an online nudge, compared to other setups. An online intervention might be more cost-efficient and less labor-intensive to distribute among the target group compared to traditional nudging methods. Therefore, studying how policymakers and scientists should use the nudges online and optimizing the procedure might have a profound effect on the usability within policymaking.

Do citizens accept FITD as an intervention to stimulate waste separation?

The second sub research question aimed to reveal the public acceptability of governments using the FITD intervention. Within this research, most participants approved the use of this type of intervention, and participants, on average, found the intervention in the online environment as acceptable as within the door-to-door procedure. However, participants that were subjected to the FITD perceived the intervention as less acceptable, potentially because they are aware of the nudge and feel manipulated.

Only one question about the acceptability was used within the experiment. This method does provide some insights about the acceptability of the FITD. However, future research could focus on the factors affecting the acceptability of a behavior influencing tool by conducting more extensive research or an unstructured interview.

By revealing the factors that affect the acceptability, policymakers, and scientists can improve the design of future nudges, to increase the acceptability. Improving the acceptability desired since the currently available researches seems to suggest that the effectiveness of a nudge is dependent on the effectiveness.

What is the effect of increasing transparency?

At last, this thesis tried to address whether transparency affected the effectiveness and the acceptability of the FITD technique used as a driver of fruit and vegetable waste separation. If the information is provided, and the participants are not subjected to the nudge, the added transparency resulted in an increased compliance rate compared to the control group.

Nevertheless, if the FITD is applied, and the participant is informed afterward, the increased compliance rates, observed for both separate variables, diminish. This result is remarkable because earlier transparency studies with other types of nudges indicate that transparency should not affect the effectiveness of the tool.

During the evaluation of the results, it occurred that there was one significant difference between the experimental setups of earlier researchers and the experimental setup within this thesis. The other researchers provided the information before the start of the nudging procedure. The added transparency within the research conducted in this thesis is provided after the nudging procedure already started.

The moment of informing participants might result in a lower acceptance of the intervention because a person might feel extra manipulated due to the moment the information is provided. The information potentially increased the awareness of the presence of the nudge, causing participants to feel manipulated and recognize that they are the target of the intervention. This aspect might cause the participant to perceive the intervention as less acceptable and, therefore, making it less effective.

Thus, the moment of informing participants might be vital to have an ethical sound and effective nudge. Future research is needed to confirm the relation between the moment of adding transparency, and the acceptability of the policy measure. If this relation indeed exists, it is crucial for policymakers and scientists that wish to use nudges legitimately, to consider the timing of the information.

Other observations

Within the FITD procedure, it was revealed that the perceived ability to separate fruit and vegetable waste indicated that participants that felt better able to perform the desired action, complied with the target request more often. Again, the limited number of participants affects the reliability of this result. Therefore, further research needs to prove this correlation between the perceived ability to perform the task and compliance rates. If this correlation is indeed present, it could be of added value to determine how effective the implementation of a fruit and vegetable waste management system in an area might be and where the perceived ability should be enhanced and stimulated.

Finally, some unanticipated effects occurred. Firstly, some participants contacted the researcher for extra tips and to provide feedback after the experiment, suggesting there is a long-lasting commitment created by using the FITD. Moreover, people that did not participate in this research asked for a small kitchen container to separate fruit and vegetable waste themselves.

This spillover effect might have been caused because they saw other neighbors separating their fruit and vegetable waste, or because it has never occurred to residents that they had the opportunity to separate the organic material. Nevertheless, this might be a useful observation for policymakers, indicating that by activating individuals within a community, the whole community might be mobilized.

Methodology reflection

During the research, a virus outbreak occurred. Hence, the experimental setup changed, allowing the researcher to compare an online nudge with nudging in presence. The experimental design differed from the original setup, adding another variable. With the limited number of participants, and the unrealistic age/gender/demographics distribution, and the number of variables, it is difficult to make sustainable conclusions.

Moreover, the researcher presented the target request to the participants directly after the preliminary survey. The available literature suggests that this might decrease the effectiveness of the tool compared to having some time in between. Future research should consider including a break of a couple of days between these stages. Nevertheless, within this research, due to the limited amount of time, the labor intensity, and the minor differences in effectivities, the researcher decided to derive from the most effective method slightly.

Besides these external factors, the structured closed-ended interview setup restricted the interviewer to a pre-decided script, meaning it is not possible to step outside the interview protocol unanticipated and discuss topics that surface during the interview. Hence in this research, extra information about the acceptability remained hidden. It occurred that the structured interviews did not allow for a full exploration of individual perspectives and circumstances, leading to incomplete information.

Some of the participants within the age category of 55+ explained that they did not want to go outside unnecessary due to health risks related to the virus outbreak. They did not want to comply with the target request and dispose of fruit and vegetable waste at the community garden. Incorporating an open question related to the reason they did not comply with the target request could have enhanced the research.

Also, to address the effectiveness of the FITD, the compliance rates with the target request were measured. The method used within this thesis assumes that a person that complied to separate the fruit and vegetable waste and dispose of it at the community garden is genuinely going to perform the act. Hence, the actual effectiveness of the FITD might be lower than accounted for within this research.

Moreover, it is challenging and time-consuming to measure the actual amount of waste that is separated or the number of times a participant visits the garden. Future research, however, should try to measure the “actual” effectiveness of the FITD intervention as a driver of fruit and vegetable waste separation by using indicators such as kg separated fruit and vegetable waste per person or number of visits to dispose the fruit and vegetable waste at the disposal facilities to compare the effectiveness of the intervention compared to the control condition. ‘

Also, the debriefing took place in the online procedure directly after participants complied with the target request. Because participants were not obliged to participate in the experiment at the same moment, they might have talked about the experiment before participating. Future research could prevent this from occurring by selecting participants that live further from each other or ask whether they are already aware of the purpose of the research. Nevertheless, due to the limited timeframe in which the responses were received, it is not expected that it has a high impact on the research.

Finally, the current setup of the online procedure made it easy to stop during the experiment if the participant is interrupted. Besides, people that received the prompt to participate within the experiment were able to postpone until they forget about it since no end date was mentioned, and no reminder was given. Future experiments could easily ask participants to fill in the questionnaire within a couple of days, creating some urgency and potentially increasing the participation rates.

Policy recommendations

This section will reflect on the usability of the FITD as a policy measure to stimulate (sustainable) actions. The effectiveness of the FITD, the cost efficiency compared to traditional policymaking, the long-lasting commitment, and the spill-over effect make the FITD a competent tool for policymakers to implement as a driver for sustainable behavior. These factors imply that it might be interesting to use the FITD to activate individuals, hoping they might inspire other people by displaying the desired behavior.

While considering the application of the FITD as a driver for sustainable behavior, there are some critical remarks. It is very labor-intensive to go door-by-door to apply the FITD face-to-face. This method would imply that municipalities need many employees or hire external workforce, resulting in excessive costs and making the processing time-consuming. Thus, this makes the FITD intervention significantly less cost-efficient if applied door-by-door.

Moreover, because this comparison indicates that the compliance rates are the same for the online procedure, policymakers could consider using the FITD online, complementary to current policy measures. The online FITD is a capable driver of fruit and vegetable waste separation and potentially other sustainable behaviors. This method is easier to use on a large scale due to the possibility of distributing it broadly. However, as occurred within this thesis, it might be challenging to target specific groups, and the limited knowledge related to using the FITD online leaves plenty of room to improve these compliance rates. Hence, policymakers should consider investigating the online application further.

Also, the current situation could affect the way policymakers could apply future nudges since the social distancing might be around for some years. Policymakers ought to be a role model for their society. Therefore, physical attendance for nudging might not be desired or possible. Hence, policymakers need to acquire insights into online nudges used to stimulate sustainable behavior and whether there is a future for nudging in a 1.5-meter distance society. This insight could help policymakers to choose the most effective online green nudge.

Besides the recommendations on the usability of the tool, governments should at least consider making nudges more transparent for ethical deployment. The available scientific literature suggests that informing participants before the nudge takes place should not affect the effectiveness of the nudge. However, this research revealed, though the sparse number of participants should be considered, that the moment of informing citizens might be vital for the effectiveness of the nudge.

These results should enhance the research on governmental nudges to get more knowledge on how we can benefit from using them to get people to, in the end, behave more sustainable. These results can also help the municipality of Rotterdam to make the implementation of future waste management systems more effective and can inspire other governmental organizations or companies in their strategy.

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9 APPENDIX

9.1 APPENDIX I: SCRIPT FITD EXPERIMENT

Goede middag Meneer/Mevrouw.
Ik ben een student aan de Tu Delft en Universiteit Leiden. Voor de gemeente Rotterdam ben ik bezig met een kort onderzoek. Het onderzoek heeft te maken met afvalscheiding. Het onderzoek is vrijwillig, u mag altijd stoppen tijdens het onderzoek. De gegevens zullen anoniem worden opgeslagen. Zou u aan dit onderzoek willen meewerken?

Vragenlijst:

In dit onderzoek neem ik een vragenlijst van 4 korte vragen af. De vragen gaan over groente en fruit resten scheiden.
Op een schaal van 1 tot 5 hoe erg bent u het eens met de volgende stelling?

Vraag 1: Mensen misbruiken de natuur op de manier hoe we nu leven.
Vraag 2: Ik vind het belangrijk hoe andere mensen over mij denken.
Vraag 3: Ik denk dat groeten en fruit resten scheiden van het andere afval goed is voor het milieu.
Vraag 4: Ik denk dat ik groente en fruitafval kan scheiden als ik de mogelijkheid zou hebben.

Informeren:

In dit onderzoek gebruik ik een eerder geteste tactiek. Het bestaat uit een kleine vraag en grotere vraag. Dit kan ervoor zorgen dat u een andere keuze maakt.
Het doel van dit onderzoek is te kijken of we mensen een duwtje in de goede richting kunnen geven. Hopelijk met het resultaat dat meer mensen groente en fruit willen inzamelen.

Hoofdvraag:

Naast de eerdere vragenlijst is er nog een extra onderzoek. Dit is een onderzoek naar groente en fruit afvalscheiding bij gemeenschappelijke tuinen. Het doel is om mensen een maand hun groente en fruitresten te laten scheiden en naar de gemeenschapstuin te brengen. Deze tuin gebruikt uw resten in de moestuinen om verse producten te verbouwen.

Om het scheiden te faciliteren delen we kleine keuken bakjes uit (9L). Ook krijg je een kaart met informatie. Op de kaart staat waar je de resten heen kunt brengen. Op de informatiekaart staat ook wat wel en niet in de bak mag.
Bij ja: Bedankt dat u zich hiervoor wilt inzetten. Voor dit onderzoek wil kom ik na een maandje terug om te kijken hoe het scheiden van gf afval bevallen is. Vindt u dit goed?

Verder heb ik nog een laatste vraag: Hoe acceptabel vindt u het gebruik van sturen vanuit de overheid op een schaal van 1 tot 5?

Debrief

Bedankt voor het deelnemen aan mijn onderzoek. Het doel van het onderzoek is het kijken of een sturing nog steeds werkt als mensen zich er bewust van zijn. Ik maak gebruik vaan een manier om een keuze aantrekkelijker te maken.

Heeft u op dit moment nog vragen over het onderzoek?

9.2 APPENDIX II: ONLINE GOOGLE FORM

Thesis onderzoek Remco Huntjens

Mijn naam is Remco Huntjens, ik ben een master student aan de Tu Delft en Universiteit Leiden. Samen met de gemeente Rotterdam ben ik bezig met een kort onderzoek (maximaal 5 minuten).

Zoals u misschien op een eerder moment al heeft gehoord zou ik langs de deuren gaan. Door de huidige situatie is dit niet meer verstandig. Echter zou ik wel nog graag afstuderen dit jaar. Daarom is het belangrijk voor mij dat mensen mee doen met mijn onderzoek.

Het onderzoek heeft te maken met afvalscheiding. Het onderzoek op vrijwillige basis en u kunt altijd stoppen tijdens het onderzoek.

Alvast bedankt voor uw hulp!

1. Ik geef toestemming dat mijn gegevens anoniem worden opgeslagen en enkel worden gebruikt voor dit onderzoek.

   Markeer slechts één ovaal.

   - ◯ Ja
   - ◯ Nee

2. Wat is uw leeftijd?

   Markeer slechts één ovaal.

   - ◯ 18-25
   - ◯ 26-35
   - ◯ 36-45
   - ◯ 46-55
   - ◯ Ouder dan 55 jaar

3. Wat is uw geslacht?

   Markeer slechts één ovaal.

   - ◯ Man
   - ◯ Vrouw

Vragenlijst

In dit onderzoek neem ik een vragenlijst van 4 korte vragen af. De vragen gaan over duurzaam gedrag.
Op een schaal van 1 tot 5 hoe erg bent u het eens met de volgende stelling?

4. Mensen misbruiken de natuur op de manier hoe we nu leven.

Markeer slechts één ovaal.

	1	2	3	4	5	
Oneens	◯	◯	◯	◯	◯	Eens

5. Ik vind het belangrijk hoe andere mensen over mij denken.

Markeer slechts één ovaal.

	1	2	3	4	5	
Oneens	◯	◯	◯	◯	◯	Eens

6. Ik denk dat groeten en fruit resten scheiden van het andere afval goed is.

Markeer slechts één ovaal.

	1	2	3	4	5	
Oneens	◯	◯	◯	◯	◯	Eens

7. Ik denk dat ik groente en fruitafval kan scheiden als ik de mogelijkheid zou hebben.

Markeer slechts één ovaal.

	1	2	3	4	5	
Oneens	◯	◯	◯	◯	◯	Eens

Aanvullend onderzoek

In dit onderzoek test ik een eerder geteste methode om mensen hun keuzes te sturen. Het bestaat uit een kleine gunst en grotere vraag. Dit kan ervoor zorgen dat u een andere keuze maakt. Er wordt onderzocht of mensen een duwtje in de "goede" richting kunnen krijgen zonder dit te forceren. Hopelijk met het resultaat dat meer mensen groente en fruit willen inzamelen.

Naast de eerdere vragenlijst is er nog een extra onderzoek. Dit is een onderzoek naar groente en fruit afval scheiding bij gemeenschappelijke tuinen. Het doel is om mensen een maand hun groente en fruitresten te laten scheiden en naar de gemeenschapstuin te brengen. Deze tuin gebruikt uw resten in de moestuinen om verse producten te verbouwen. De Vredestuin bevind zich op maximaal 250 meter van uw woning (richting het Hofplein aan de overkant van de straat, bij de spoortunnel).

Om het scheiden te faciliteren delen we kleine keuken bakjes uit (9L). Ook krijg je een kaart met informatie. Op de kaart staat waar je de resten heen kunt brengen. Ook staat er wat wel en niet in de bak mag.

Hier kunt u uw groente en fruit materiaal kwijt.

8. Zou u zelf ook voor een maand uw groente en fruit materiaal willen inzamelen en naar de tuin brengen?

   Markeer slechts één ovaal.

   ◯ Ja *Ga naar vraag 9*

   ◯ Nee *Ga naar vraag 11*

Vervolg

9. Bedankt dat u zich hier voor wilt inzetten. Om onnodig contact te voorkomen zal ik het bakje met daarin het informatiekaartje bij de deur neerzetten de komende tijd. Hiervoor is het echter wel belangrijk om een adres te hebben. De adressen zullen apart en anoniem bewaard worden.

10. Voor dit onderzoek wil ik na een maand het gebruik van het bakje evalueren. Mijn plan is om dan langs de deuren te gaan om hier naar te vragen, maar het kan zijn dat de situatie er voor zorgt dat dit anders moet. In dit geval zal ik via een andere weg contact met u zoeken. Vindt u dit goed?

Markeer slechts één ovaal.

- ◯ Ja *Ga naar vraag 11*
- ◯ Nee *Ga naar vraag 11*

Einde onderzoek

Bedankt voor het deelnemen aan mijn onderzoek. Overheden raken steeds meer geïnteresseerd in het gebruik van gedragswetenschappen om mensen naar duurzaam gedrag te sturen.

Het doel van het onderzoek is het kijken of een sturing nog steeds werkt als mensen zich er bewust van zijn. Deze kennis kan gebruikt worden om gedragsbeïnvloedingen eerlijker in te richten.

11. Hoe acceptabel vindt u het gebruik van sturende methodes vanuit de overheid op een schaal van 1 tot 5?

Markeer slechts één ovaal.

	1	2	3	4	5	
Niet acceptabel	◯	◯	◯	◯	◯	Acceptabel

9.3 APPENDIX III: INFORMATION CARD

Praktische informatie GFT scheiden

Hoe gaat het GFT scheiden in zijn werk?

Stap 1: Scheid je groente- en fruitresten in de groene afvalemmer
Stap 2: Leeg de emmer in de verzamelbak tussen de twee gebouwen bij de Vredestuin (zie afbeelding)

Gebruik alsjeblieft geen composteerbare zakjes. Deze breken niet af op de composthoop.

Tip: Doe onderin de afvalemmer een laagje zaagsel (verkrijgbaar bij de vredestuin tijdens werkmomenten). Dat neemt vocht op en voorkomt luchtjes. Gesnipperde wc-rolletjes of eierdozen (zonder etiket) mogen ook.

Welke resten gebruiken wij graag voor onze tuin? Schillen en etensresten van bijvoorbeeld:	Wat kunnen wij NIET composteren:
aardappelen	**composteerbare zakjes** (deze breken niet goed af op onze composthoop)
groente	**brood** (in verband met ongedierte)
fruit	**gekookt en gebakken eten**
eierschalen	**vis of vlees**
doppen van pinda's en noten	**olie en frituurvet**
koffiedik	**(kippen)botjes**
koffie filters (geen koffie pads)	**uitwerpselen van hond of kat**
theezakjes (zonder etiket en nietje)	**bedrukt papier**

HEB JE NOG EEN VRAAG?
Loop tijdens het werkmoment op vrijdag tussen 11 en 14 uur of zondag tussen 14 en 17 uur even langs bij de Vredestuin (park Pompenburg).

Gemeente Rotterdam

9.4 APPENDIX IV: RESEARCH FLOWCHART