

Behavioural insight to promote reusable cups – a field study on reducing the use of single-use cups



About the Report

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The opinions expressed within this publication, and any errors and omissions, are the responsibility of the authors. This paper does not necessarily reflect the positions of the Swedish EPA.

Executive Summary

This report summarizes the scope, design and key results of a pilot study using “green nudges” to reduce consumption of single use takeaway cups in Sweden. The study took place during the spring of 2022 at a set of cafés in Gothenburg, Sweden’s second largest city.

Plastic is used in many products in society and has become an important and common part of our everyday lives. Many of the properties of plastic are desirable, which means that it is hard to stop using this material. Unfortunately, however, plastic waste is difficult to handle, separate and recycle. Moreover, being commonly used in a huge variety of products, plastic contributes to the pollution of land and sea.

In food packaging, the focus of this study, plastic is used in materials and products in direct contact with food and acts as a container, hygienic barrier and helps to preserve the shelf life of the food. Few other materials have the same combination of desirable properties. For take-away coffee, single use cups with plastic content are used in great volumes. In Sweden alone, an estimated 500-100 million coffee cups containing plastics are used every year (Håll Sverige Rent, 2019). It is thus crucial to develop and implement alternatives that reduce the usage of single-use cups for coffee and other beverages.

Governments around the world are prioritising plastic pollution and littering as an environmental urgency. As with many other sustainability threats, consumers, businesses, and policymakers tend to be aware of plastic pollution, but often fail to translate this awareness into more sustainable behaviours (Hartley et al., 2015; Pahl & Wyles, 2017). Nudging, an emerging policy tool derived from behavioural insights, is increasingly applied to stimulate behavioural changes. Since human behaviour is central to the causes, consequences and solutions related to plastic litter and pollution, nudging can therefore also be used to complement conventional policy tools.

To improve the knowledge concerning the design and implementation of – and effects from – green nudges to reduce the usage of single cups, a study took place at a set of cafés in Gothenburg during the spring of 2022. The three nudges evaluated originated from two previous studies financed by Naturvårdsverket (Swedish Environmental Protection Agency, 2021; WRAP, 2021). During the preparation phase, involving extensive dialogue with the cafés participating, it was agreed that only one of the suggested nudges was feasible to implement. Existing loyalty programs as well as limitations with respect to space and facilities for washing cups were among the reasons for limiting the number of nudges tested.

Even with this limitation, though, the study resulted in a set of key recommendations of value for business owners, policymakers, and consumers. The recommendations can be read in full under Conclusions and recommendations but below you will find a general and condensed version of said recommendations:

- Financial rewards such as discounts have little to no effect on customer behaviour. Governmental agencies should instead provide information, grants and facilitate local discussions amongst business-owners to make it easier for them to implement solutions for reusable packaging.
- Systems for recycling reusable packaging should be implemented where a well-established pattern for environmentally sound consumer behaviour can be found. Using and returning reusable packaging is easier at sites that one often visits. Moreover, where possible, business owners should team up for implementation of common and shared solutions.
- Projects for development and evaluation of nudges should be co-created with the business-owners and staff whose workplace will serve as the arena for the tests. This will lead to better nudges, smoother implementation and more exact evaluation.

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1. Introduction

1.1 Problem and challenges – Plastic litter and why it is worth tackling

Plastic is used in many products in society and has become an important and common part of our everyday lives. Many of the properties of plastic are desirable, which means that it is hard to stop using this material. Unfortunately, however, waste including plastic is difficult to handle: different types of plastics are difficult to separate and recycle. Moreover, being commonly used in a huge variety of products, plastic contributes to the pollution of land and sea.

According to UNEP, 80-85 percent of the total amount of marine debris consists of plastic causing the most extensive and harmful litter in the oceans (UNEP, 2021b). Globally, 9-14 million tonnes of plastic waste end up in the sea annually, where it breaks down to microplastics by UV light and abrasion. Microplastic, is found all the over the world and everywhere in nature. Recent studies also reveal that microplastics has been found in human blood (e.g., The Guardian, 2022).

In food packaging, the focus of this study, plastic is used in materials and products in direct contact with food and acts as a container, hygienic barrier and helps to preserve the shelf life of the food. Few other materials have the same combination of desirable properties. Single-use cups used for takeaway drinks such as coffee are typically made from polystyrene or polymer-lined paperboard. Globally, over 500 billion single-use cups are consumed annually of which between 250-300 billion are plastic-lined paper cups and this number is expected to grow as single-use cups are made more available in middle- and low-income countries (UNEP, 2021). It is thus not strange that single-use cups are one of the top ten items found littered on beaches around the world. In Sweden alone, an estimated 500-100 million coffee cups containing plastic are used every year (Håll Sverige Rent, 2019).

In 2019, the UN Environment Assembly addressed the issue of single-use plastic pollution, raising their concerns and encouraging and inviting Member States to work collectively to take action (UNEP, 2021). In the same year, the EU decided to ban a range of single-use plastic products “for which there is an alternative” and require EU Member States to take measures to reduce the consumption of certain single-use plastics for which there is no alternatives, for example such as drinking cups including covers and lids (European Commission, 2019).

The same year, the Swedish government announced its plan to implement the EU's single-use plastics directive (Regeringskansliet, 2022). One of the measures, to be introduced in 2024, requires those who offer fast food and drinks in single-use packaging to also offer a reusable alternative. The goal of the measure is to allow people to continue to buy food and drink as today, but without the environmental impact of single use items. The goal of the measure is that the use of single-use cups and single-use lunch boxes in Sweden should have decreased by 50 percent by 2026.

1.2 Behavioural insights and nudging as complements to the policy toolbox

Today, governments around the world are prioritising plastic pollution and littering as an environmental urgency. As with many other sustainability threats, consumers, businesses, and policymakers tend to be aware of plastic pollution, but often fail to translate this awareness into more sustainable behaviours (Hartley et al., 2015; Pahl & Wyles, 2017). To bridge the gap between awareness and sustainable behaviour change, scholars have advised policymakers to consult expertise in the behavioural insights (Pahl & Wyles, 2017). Behavioural insight is an evidence-based field that combines insights from psychology, cognitive science, and social science to gain accurate understanding of human behaviour and thereby develop effective interventions that promote behaviour change. Although still being in its infancy, behavioural insights has already been integrated into public policy and is increasingly being applied by governments all around the world (OECD, n.d.; UN, 2021).

Nudging, an emerging policy tool derived from behavioural insights, is increasingly applied as a means to stimulate behavioural changes. Nudging is appropriate when individuals' intentions are aligned with the performance of a given desired behaviour, but they fail to act in accordance with this due to situational or psychological constraints (Swedish Environmental Protection Agency, 2021).

Since human behaviour is central to the causes, consequences and solutions related to plastic litter and pollution, nudging can therefore also be used to complement conventional policy tools. Hence, nudging is increasingly applied to address challenges related to sustainability and the environment (so called 'green nudges'). The 'green nudging' approach involves making strategic changes to the context in which individual decisions are made to promote more sustainable choices (Byerly et al., 2018).

Unlike traditional policy tools, nudging builds on people's ways of thinking and decision-making, to direct specific behaviours in predictable ways. Nudges occur in the actual setting in which a behaviour is performed, why behaviour is influenced at a closer range than traditional policy tools. Furthermore, nudging is feasible in a wide range of contexts and is generally acceptable to most people, compared with regulation and economic policy instruments (Swedish Environmental Protection Agency, 2021).

This report presents the scope, design and results of a pilot study using "green nudges" to reduce consumption of single-use takeaway cups in Sweden. The study took place during the spring of 2022 at a set of cafés in Gothenburg, Sweden's second largest city. Gothenburg aims at being a sustainable city and has even ranked as the world's most sustainable destination according to the Global Destination Sustainability Index five times in a row (from 2016 to 2021).

2. Background: Insights from previous studies

The study reported in this document builds on two previous reports funded by the Swedish Environmental Protection Agency in 2021.

The **first report**, *Next Steps: Tackling Plastic Litter - A Nudging Strategy for Reducing Consumption of Single-Use Disposable Cups* (Swedish Environmental Protection Agency, 2021), provides a thorough introduction to the use of single-use cups and the psychology around littering and the use of nudges as a means for switching to more sustainable behaviours. As mentioned above, consumers are often aware of environmental problems related to consumption patterns. Still, that awareness rarely translates into pro-environmental behaviours such as using a refillable cup instead of a single-use cup. The report concludes that this is the main argument for policymakers to investigate solutions (i.e., nudges) that makes it easier for consumers to act on their intention.

The report suggests three types of nudges to be implemented and evaluated in a field study to gather insights around ease of implementing as well as a perspective from business owners, capturing negative externalities and most importantly show if the nudges have the desired effect on having takeaway beverage served in a multiple-use cup instead of a disposable.

The three nudges suggested were:

1. A soft default meaning that single-use disposable cups will no longer be the default option.
2. Giving consumers who bring their own reusable cup more convenience by opening an “express lane” for them.
3. Tying loyalty programs and pre-paid servings to the use of a refillable cup.

The **second report**, *Exploring the Use of Green Nudges to Reduce Consumption of Disposable Coffee Cups in Sweden*, was authored by the organization Wrap. The original aim of the study was to test the feasibility of mentioned nudges before evaluating them in a large-scale field experiment (WRAP, 2021). However, the Covid-19 pandemic forced the team behind the report to rethink the idea and instead turning the study into an online survey involving a selection of adults in Sweden. By doing this, Wrap gathered insights on what nudges might have the best effect, would be most accepted by consumers and how the initial three nudges could be optimized to create a greater effect.

The survey showed that trying to make a dent in consumption around hot takeaway drinks is reasonable as 82 percent of Swedes make such purchase on a weekly basis. Up to 55 percent of consumers also say that they already own a reusable cup, although only 16 percent use them regularly. Forgetfulness is cited as the main reason for this.

Results from the survey suggests that each nudge should be tweaked to have a greater impact on the behaviour of customers:

1. The default-idea should include that the barista always asks the customer if they want their drink in a reusable cup. Having a drink in a single-use cup means that their order will be two Swedish kronor more expensive.
2. The idea around express-lines for people who bring their own mug should be boosted by removing all branding from single-use mugs as well as having lids be something the customer must ask for.
3. The idea around loyalty programme is mainly boosted by technology that would make usage smoother – adding scannable bar/QR codes to each reusable mug.

The report from WRAP also highlights that each specific nudge will be more suitable for certain contexts. I.e., a specific nudge could fit better in a canteen or a fast-food restaurant while being less effective in a café. However, at the end of the day it is up to each business to decide on what approach that suits them the best and what nudges that would have the greatest impact on their customers.

3. Conclusions and recommendations

Conducting pilot experiments in real-life contexts is often challenging, so also in the case of the study reported in this document. First, implementing ideas at sites whose owners and staff haven't had the chance to be part of the discussion from the very beginning involves several challenges. Second, launching a study that involves the engagement and actions of business owners and staff still struggling to recover from the effects from the pandemic results in a tall order. Hence, despite the fact that the three nudges we intended to test were already developed and evaluated in a pre-trial getting cafés to participate in the study took a lot of time and effort and only one nudge was implemented (see section 5.1 *Pre-launch experiences*). Still, thanks to the cafés who were willing to participate (three locations from café chain 1 and one location from café chain 2) we managed to get a better understanding of what it takes to switch consumer behaviour from single-use to reusable cups and below we share the main conclusions from the study.

With respect to statistics involving the use of reusable cups, one out of four locations (café chain 2) was already tracking sales of beverages in reusable cups as this was tied to a discount. The other three cafés (café chain 1) had no such data prior to the study. A failed attempt to establish a baseline was to manually count the use of single-use cups at each location. This added to the staffs already busy workday, so the idea was cancelled. Luckily the staff had a good sense of how often a purchase with a reusable cup happened as most of the staff had never witnessed such an event.

Our first conclusion relates to data-collection and the strive to establish data hygiene at the involved sites. Café chain 1 agreed to create a new product item (coffee in reusable cup) in their system but then getting that data together with a timestamp was a challenge in its own. Projects looking to shift consumer behaviour in similar environments should therefore make sure that the right kind of behavioural data is already in place or can be implemented in such way that makes it easy for the staff to log said data.

Our second conclusion also relates to the choice environment and its staff. One location showed a dramatic increase in sales of coffee in reusable-cups. Part of the explanation relates to the site and its customer's behaviour. The café was smaller and mainly targeted people on the go. They also had a steady group of regular customers buying their takeaway coffee routinely. Still, the commitment from the staff at this site made all the difference. If this commitment increased thanks to the visit from the creator of the reusable cups or if the staff already had an interest in sustainability is hard to tell. Thus, having committed "front line staff" seems to make a difference in this case. Needless to say, it is hard to build a policy around this conclusion, but it goes to show how important an inclusive implementation process really is for these kinds of nudges.

Our third conclusion relates to the nudge actually tested: providing a financial incentive for the desired behaviour. The original idea was to provide a financial incentive for the *undesired* behaviour (having a beverage in a single-use cup). However, business-owners were not willing to implement this idea as they did not want to punish their customers. This argument is often mentioned by business-owners which could serve as an argument for a tax on single use plastic cups as it would put the blame for any inconvenience somewhere else than on the owners and their staff. Still, there is very little evidence that a financial reward will have a huge impact on consumption of hot beverages served in a reusable cup.

3.1 **Nudging as a policy approach at a city-level**

The area of sustainability and circularity is identified as a very suitable context in which the development of practices around nudging can take place. Moreover, the context of cafés and restaurants – as well as events such as festivals and sports competitions – offers platforms that are suitable for the development and evaluation of nudging as a tool. Nudges tested can change the operations and behaviours of customers/consumers, core actors as well as their suppliers and partners.

However, there are a few core issues that needs to be addressed properly to assure a successful development. First, a “systems-perspective” must be applied when designing, implementing and running pilots and evaluations. No actor alone is fully in charge of all the resources and activities that are involved in the projects. Second, a “portfolio-perspective” should be applied with respect to projects and pilots. Design, implementation and evaluation of green nudges must be seen as a long-term process involving consecutive and coordinated pilots and projects. Hence, the funding must also be seen as a long-term investment. The knowledge, synergies , momentum and engagement build up among collaborating partners must be well managed seen as a long-term means for transformation.

Reflecting challenges related to a transformation of business models for sustainability and circular economies, it is also observed that there would be a need for projects and pilots evaluating different structures and platforms. The project described in this report clearly highlights that there are numerous ways to use nudging, and they may involve different financial models.

3.2 **Recommendations**

Providing general recommendations to such a wide audience as the target audience for this report is difficult and possibly of lower value. However, the key findings from the study provide insights useful for policymakers, business-owners and consumers. Each group face their own particular challenges when it comes to reducing the use of single-use plastic cups. For this reason, we provide three recommendations for each of the key target-groups. Hopefully the recommendations can serve as a basis and input for further action.

3.2.1 Recommendations for business-owners

1. Despite having little to no effect on usage of reusable cups, we still recommend businesses that offer takeaway beverages to provide a discount for those who bring their own reusable cup, or a charge for those choosing to have their beverage in a single-use one. How the incentive is framed (discount or charge) has an impact and it hopefully grabs customers attention, thus informing or reminding them what the desired behaviour is. The incentive should be clearly communicated: many cafés already offer a small discount for this behaviour, something few people know about.
2. We also recommend business-owners to team up with restaurants and cafés in the neighbourhood. Using a reusable cup for coffee works well for regular customers who get their coffee from the same place on a daily basis. To get the rest onboard, circular systems for reusable packaging should be installed at multiple locations. For this reason, we recommend business-owners to start a local dialogue with the aim of implementing a common system for recyclable packaging across a neighbourhood or business district.
3. Business-owners and their staff play a critical role in providing insights to policymakers and entrepreneurs working with alternatives to single-use plastic packaging. However, allocating time for providing insights or testing new ideas is very difficult in low-margin businesses without compensation. Hence, we recommend business-owners to strive for being a core part of future projects and making sure that they too are compensated for their efforts. More on this topic below.

3.2.2 Recommendations for policymakers

1. The study completed demonstrates that financial incentives have little impact on the use of reusable cups. Creating a tax on plastic goods such as single-use cups will mainly serve as a tool for communication. Such an effort will put the issue of single-use plastics in the public debate for a while, but do not expect any larger behavioural changes when it comes to reusable cups. Despite this, a tax, liked the one used for plastic bags, will be the best way to force business-owners to create alternatives to single-use cups. Therefore, we still recommend such a tax as a tool to escalate a much-needed shift in the industry.
2. Cafés and other businesses offering coffee to customers are generally not generating high revenues. Hence, involving owners and staff in studies and business development is difficult: There is simply no time and money for staff and entrepreneurs to participate properly in projects such as this one. Therefore, we recommend financiers of similar projects to demand that a certain part of the budget is ear-marked to provide compensation to business-owners so that they can be an active part of the projects without risking constraints to their businesses. Eventually, new business models reflecting changes in policy and customer behaviours will develop, but until such models have been formed and established tests and pilots risk jeopardizing the fragile economics of actors and entrepreneurs in the café'-business.
3. There are several interesting systems for recycling reusable cups that have been implemented across the world, such as Recup/Rebowl in Germany, the One planet One chance system in the UK and Huskee, based in Australia to name a few. When these systems reach a critical install base (cafés, restaurants etc.) the act of using reusable-cups becomes more frictionless for the consumer. In other words: it takes more than a couple of business-owners to make this behaviour become mainstream. To stimulate this

change-process, government agencies and local actors should provide an arena for business-owners to meet and plan the shift as well as provide financial means for those who want to install recycling-systems for reusable cups.

3.2.3 Recommendations for consumers

1. First and foremost - buy and start using a reusable cup. To make sure you do not forget it at home - place it at a clearly visible place in your home, next to the door or even already in your bag. Baristas will not find it strange if you bring a cup of your own, and the act of using such a cup will not add friction to their job.
2. Start small-scale and focus on the contexts that you are used to and frequently visit. Note that systems for recyclable packaging also works best in a closed environment. Do you and your colleagues still use single-use cups at your workplace, the canteen or at your gym? Start a discussing around the switch to reusable cups for this particular space and highlight the fact that the acceptability for removing single-use cups is higher than one can expect. You could also add a sign next to the dishwasher at your workplace, inviting people to use it to wash their reusable cups.
3. Reinforce and encourage baristas and the cafés who are already a part of the shift towards reusable cups. As this report shows, the commitment and engagement from the staff is crucial in increasing the use of reusable cups. Help them stay motivated by complimenting them on their efforts!

4. Design of the study

4.1 Implementation

As will be further described in detail, implementing the recommended nudges in the context of the daily operations of the cafés turned out to be challenging. Early in the project, discussions were held with three café actors in Gothenburg: café chain 1 and café chain 2, both premium coffee shops with multiple locations, and a student-led café on a university campus.

Unfortunately, despite informative and constructive discussions the student-led café decided not to be part of the project. The main reasons for their decision were related to existing systems for discounts and loyalty programs.

Café chain 1 decided to implement the study in three locations in central Gothenburg and Café chain 2 agreed to provide access to a café which could serve as a control.

The table below show a description of the three sites of café chain 1. We also describe the difference in customers, location and consumer behaviours as such factors could play a role in the assessed effectiveness of nudges evaluated.

Site	Owner	Hours	Characteristics
Location 1	Café chain 1	08:00-21:00	Street-level, central location, commuter-friendly
Location 2	Café chain 1	09:00-19:00	Located within a department store, mainly used by staff and shoppers
Location 3	Café chain 1	09:00-19:00	Street-level, high-traffic street, very popular place for lunch

Table 1: Locations, traits, and baseline data

4.2 Nudges for evaluation

As reflected in the detailed feedback from staff and business owners (see the discussion below), it became clear that two of the suggested nudges, nudge 2 - an “express lane” for people with reusable cups - and nudge 3 connected to a loyalty program, would be impractical to implement. Instead, as a result of the dialogue with representatives from the participating cafés, it was agreed to test a version of nudge 1.

The revised nudge 1 consisted of three parts:

- A discount of five kronor for anyone buying a beverage to go using a reusable cup¹

¹ We are aware that financial incentives are not usually considered nudging and have decided to adopt a broader definition of the term.

- Posters clearly presenting the nudge at each register (see picture below) and the entrance of the café
- The possibility to buy a high-quality reusable cup at a discount (small size at 49 kronor instead of 85, large size at 69 instead of 120)

The idea was to add financial friction around undesired behaviours while making desired behaviour easier and more affordable than it used to be.



Figure 1: The nudge at one of the three cafés from chain 1

During the time of the intervention data was also collected from one other chain (Café chain 2) in central Gothenburg. This café offered customer a discount when they used a particular kind of deposit-system for reusable cups. The cups provided by this café had a higher price (170 kronor) compared to the three locations equipped with the nudge. Customers who used this kind of reusable cup also got a five kronor discount on their hot beverage.

Nudge one was implemented at all three locations from café chain 1 in April. The nudge looked the same at all three locations. However, there was one significant difference in which the three of them implemented the nudge: the café at location 1 got a personal visit from the owner and co-founder of Light My Fire, the company providing the reusable cups. The staff got a chance to hear the story behind the cups and shared some hopes for the project.

After the data was collected at location 2 from café chain 1, we were informed that people working at the department store already received a discount similar to the one offered for using a reusable cup. According to the café, this customer segment was a large one, but impossible to say how large. As the site was not able to provide a double-discount for people with reusable cup also working at the department store the nudge might appear less attractive to a large group of customers at this location

4.3 Data collection

4.3.1 Quantitative data

Data regarding hot beverages sold was collected from the three locations from café chain 1 between 2 April 2022, when the nudge was implemented, until 20 May 2022. The data collected at each café included:

- Number of hot beverages sold in a single-use cup
- Number of hot beverages sold in a reusable cup
 - Number of large reusable cups sold
 - Number of medium reusable cups sold

Additional data was also collected from a café from café chain 2 that did not implement the nudge. They already sold their coffee at a 5 SEK discount when bringing your own cup, and therefore was an interesting case to compare the study results with. Data was collected during 6 weeks, from 4 April-15 May. The data covered 4 products: Large and Medium Espresso with milk and Large and Medium Filter coffee. The sales data indicated if these products were sold in a single-use cup, in a reusable cup, or in a cup to drink at the café.

4.3.2 Qualitative data

During the nudging period, visits were made at two separate occasions at the cafés for observations and short interviews with staff and customers.

Visit 1 was conducted in the morning of 28 April. Location 1 from café chain 1 was visited between their opening at 8.00 until 9.30. Thereafter followed shorter visits at the other two locations from the same chain. The following persons were interviewed:

At location 1:

- The site manager who worked at the register
- Customer (female ~25 years) who bought coffee to go in a single-use cup
- Customer (female ~50 years) who bought coffee to go in a single-use cup, but also bought a reusable cup

At location 2

- An employee who worked at the register
- A person from the management team of café chain 1

At location 3

- An employee who worked at the register

Visit 2 was conducted in the morning of 25 May. This time only location 1 from café chain 1 was visited, between their opening at 8.00 until 9.00. The following persons were interviewed:

- The site manager who worked at the register
- Customer (female ~45 years) who bought coffee to go in a single-use cup
- Customer (male ~30 years) who bought coffee to go in a single-use cup

- Customer (male ~25 years) who bought coffee and drank it on site
- Customers (2 females ~25 years) who bought coffee and drank it on site
- Customers (2 females ~40 years) who bought coffee and drank it on site
- Customer (female ~25 years) who bought coffee and drank it on site

The main questions discussed with all the people interviewed were:

- Did you notice the offer about discounted coffee if you use a reusable cup?
- What do you think about the offer?
- What do you think about bringing your own cup when you buy coffee to go?

The people from the staff were asked about their experiences during the nudging period. They discussed both how the nudge had affected their work situation, but also the customers' reactions and behaviours.

5. Results and analysis

5.1 Pre-launch experiences

This section will highlight some of the challenges encountered during the pre-launch phase and explain why only one out of three original nudges was implemented. The section contains important input for future implementations of similar efforts in cafés.

Challenges for cafes in implementing the nudging options

During the pre-launch phase the original nudges were presented to the cafés in order to see which would be possible to implement at the different locations. During these discussions, several issues and feedback related to elements of the original nudges were brought up. The following table explains the feedback to various elements of the nudges.

Nudge element	Implementation experience
Charging extra for single-use cups	The cafés did not want to charge an additional fee for single-use cups. Instead, they preferred to provide a discount on beverages bought in a reusable cup. While this options practically means the same thing in terms of price difference, it was important for the cafés that their customers would not feel punished for drinking in single-use cups, but rather feel rewarded for bringing/using a reusable cup.
Connecting reusable cups to a loyalty programme	This nudge was not implemented. Several cafés already have loyalty programmes, and it was difficult to integrate another one. As an example, the student-led café already had one large discount for member of the student union, and they also sold coupons in sets of 10 which gave further discounts.

	A loyalty programme connected to reusable cups also needed some way to identify cups and record how many coffees had been bought, which would require too much technical development. It was also difficult to come up with a solution that would not exclude customers using their own reusable cups.
Express lane for customers with reusable cups	This nudge was not implemented since none of the cafés had enough customers at the same time to generate any queue. The student-led café on a university campus is an exception regarding queue, but they already had an express lane in place for customers with coupons.
Remove branding on single-use cups	This was not practical to do for such a short duration as this project. It could also result in a reduced satisfaction for some of the customers, which the cafés wanted to avoid. Cafés also mentioned that the cups are part of the marketing for the location.
Washing reusable cups	Initially there were plans to include a washing service to support the nudges, where the cafés would help wash the customers' reusable cups or provide a place for customers to wash them themselves. This was however not suggested to the cafés, since it would have large consequences for their daily operations and layout of the cafés.
Baristas asking customers if they want to use a reusable cup	This nudging element was implemented; however, it is difficult to know to what extent. The cafés saw this as easy to implement.
Selling reusable cups at a discounted price	This nudging element was also implemented, thanks to an agreement with Light My Fire which provided such cups. What made this nudge easy to implement was that the cups could be sold without affecting the regular offers. Some concerns about the design of the cups were voiced, and one chain of cafés did not want to sell them and opted for a different option.

Table 2: Feedback to various elements of the nudges

Apart from the feedback regarding the more specific nudging elements, the discussions during the pre-launch phase also uncovered some more general challenges to implementing these types of nudges or other efforts to decrease the usage of single-use cups. Any effort implemented:

- Must fit the type of establishment and their customers, in terms of quantity, behaviour, and wants at the specific location, and for a coffee chain, the

overall profile of the chain. This also involves the image or branding of the café.

- Must fit the existing offers at the location, in relation to their range of food and drink, current discounts and loyalty schemes.
- Cannot require too much extra time either to implement or operate. Cafés do not have the resources to develop their business when it comes to efforts like this that are beyond their core business of selling food and drink.
- Must assure that the customers are happy, as cafés cannot afford to make them unhappy.
- Must not result in negative consequences in the long-term, whether the efforts are removed or kept. They must be sustainable for the business.

Possibilities for implementing nudges

It became apparent that a design process based on each site's unique preconditions would have been necessary if more advanced nudges or reuse systems were to be implemented. With the scope (aim, amount of time and resources) of this project, the limited nudges in pricing were the only viable option. However, it is important to remember that "challenging" does not mean "impossible". The cafés included in the pre-launch phase all care about the environment, they care about their customers, and want to contribute to a decreased use of single-use cups. They do not however have much room or experience to conduct design projects, and therefore must be supported in future efforts that are to be implemented in cafés.

5.2 Quantitative results

During the time of the experiment the one café serving as a control showed a stable yet limited purchase of coffee in reusable cups (1-2 orders a week). None of the locations from café chain 1 logged purchases made using a reusable cup before the implementation of the nudge. However, representatives from the management at each location ensured that they had never seen customers bringing their own cup.

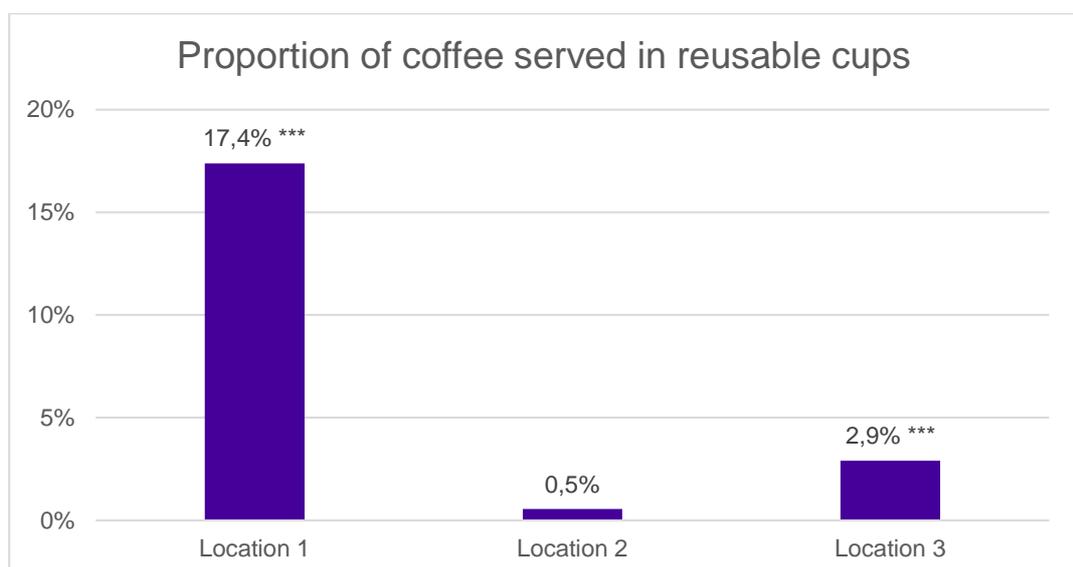


Figure 2: Proportion of coffee served in reusable cups at café chain 1. With asterisks signaling Chi² p-values in comparison to location 2. One asterisk (*) signifies a p-value of 0,05 or lower, two asterisks (**) signifies a p-value of 0,01 or lower and three asterisks (***) signifies a p-value of 0,001 or lower.

Chi² comparisons between the proportions of coffee served in multiple use cups show significant differences between all three locations, see Figure 1 above and Table 2 below.

Café 1 (proportion of reusable cups)	Café 1 (proportion of reusable cups)	p-value
Location 1 (17,4%)	Location 3 (2,9%)	<0,001***
Location 1 (17,4%)	Location 2 (0,5%)	<0,001***
Location 3 (2,9%)	Location 2 (0,5%)	<0,001***

Table 3: Comparison of proportions of coffee served in reusable from café chain 1 with significance levels of Chi² analysis. One asterisk (*) signifies a p-value of 0,05 or lower, two asterisks (**) signifies a p-value of 0,01 or lower and three asterisks (***) signifies a p-value of 0,001 or lower.

As figure 1 and table 2 shows, location 1 sold vastly more beverages served in a reusable cup compared to locations 2 and 3. Although having a lower proportion of reusable cups compared to location 1, location 3 still outperformed location 2 significantly.

The nudge did not have an impact at location 2. A few hypotheses are discussed below. The culprit could be that a large proportion of regular customers (employees from the department store inside which the café is located) already received a discount, which would remove the financial incentive for bringing a reusable cup.

5.3 Qualitative results

5.3.1 Reactions to the nudging implementations

Customers reacted positively towards the reusable cups that were sold. The cups were perceived as nice but according to the staff, some customers were not sure that they would be able to use them at other cafés and if the size would fit with offers at other cafés. Some cups were also bought by the staff themselves.



Figure 3: Two sized (large and small) of reusable cups sold at café chain 1.

The price of the reusable cups (that were heavily discounted) seems to have had little relevance for the customers. The only time price was mentioned during the data collection was by a staff at location 3, who said that some customers had said that they were too expensive. While this part of the nudge in practice was just selling a discounted cup, it was clear that a sold cup also indicated an ambition to start using it when buying coffee to go.

Besides the cup itself, customers also appreciated the overall initiative to try to reduce the use of single-use cups and viewed this as an important undertaking. All staff and customers mentioned the environmental benefits as the main reason to this. However, the customers had very different views on how attractive and challenging it would be for them personally to start using reusable cups. It is first a question of how people want to drink their coffee. Some want to sit down and relax, while some have no problem having one on the go. This of course means that a large part of the customers who buys coffee at the cafés are not really part of the target group for this initiative.

“The experience is the important thing when I drink coffee. I want to drink from a real cup and sit down. I do not like coffee to go and bringing my own cup is definitely not something I want to do” - Male customer ~40 years

It became very apparent during the visits that the participating cafés mostly have customers that buy their coffee and sit down instead of buying it to go. According to the café's management representatives, this is also very much the overarching coffee culture in Gothenburg. Staff and customers generally agreed on what kind of customers would be more attracted to buy coffee in reusable cups:

“All customers are positive, and we have sold some (reusable) cups. Middle aged people and older have been slightly easier to get onboard than younger customers. The customers' habits are important, people

who work close by are in a way more susceptible, but at the same time they might have coffee available at work which can make them less interested in this offer” - Site manager/barista

“This is a good idea. It will probably work best at work or in school when you can have your cup close by” - Female customer ~25 years

In sum, the staff and customers thought that the most important customer attributes for being receptive to the nudge were:

- That they made frequent to go purchases
- That they had a well-established pattern of how purchases are made, e.g. that they always pass the same café when going to work, or that it is a café close by their school/workplace

An important factor when trying to change the customers' behaviour was how the staff interacted with them. During the nudge, the staff had an important role in making sure that customers noticed the offer, but also in making the offer attractive.

“I bought the cup since the girl who sold it was so nice. I also thought it looked good, and that this is something that I want to try” - Female customer ~50 years, who bought a reusable cup

When the cafés were visited, the staff's approach to the nudge as a whole seemed to vary, both in terms of how well informed they were and their attitudes towards it. The staff at location 1 was enthusiastic and had no trouble asking customers about the cups. According to the site manager, it was just a matter of remembering it. They did however want to ask in a nice way and do not want to oversell to customers. The staff from the site at location 2 seemed less enthusiastic and less informed, at least at the time of the visit. The staff at location 3 were relatively enthusiastic (many of them had bought cups themselves) but find it more difficult to convince their customers.

“How much we try to persuade our customers depends on the situation and on what contact you get or already have with them. Not all customers notice the offer, and in some cases, it is not a good idea to push it... if everyone is rushed, for instance” - Site manager/barista

In relation to the quantitative data, it would make sense to say that the enthusiasm at Location 1 of café chain 1 to a large part affected their relatively large share of coffee sold in reusable cups. It must also be acknowledged that the enthusiasm at the cafés will vary, depending on the customer interest. Even if there are not data available on the matter, staff from a particular location might have been more enthusiastic from the start of the nudge, but then become more distanced if it would turn out that customer interest was lower than one had hoped for. However, it can be concluded that it is essential to have the staff invested in initiatives like this one.

The discount that was offered during the nudging period seemed to not be the main driver to change behaviour for the customers. It was rather an added bonus compared to the environmental advantages. According to the staff and the observations made during the visits at the cafés, many customers do not notice the price reduction at first, but only after purchasing the cups and being informed by the staff. The customers of these cafés mostly visit them for a great experience, and not for getting cheap coffee. Still, this does not mean that discounting coffee in reusable cups is a bad idea overall, it is just that there are other factors that the customers prioritise more, at least in the setting of this experiment.

5.3.2 Thoughts on starting to use reusable cups

While the customers agree that using reusable cups is a good idea overall, they also saw some challenges associated with it. It became very clear during the data collection that the dominant challenge from the customers' perspective is remembering to bring the cup! Many customers thought that establishing such a habit would be so difficult for them that they would not even try. Others were more positive:

“This is a great idea, very good for the environment. It's all about establishing a habit. You need to think of the cup like you think of your wallet and keys. You just bring it automatically” - Male customer ~25 years

“Ok, now I just have to remember to bring it with me next time” - Female customer (~50 years) to the barista while she bought a reusable cup

Remembering to bring the cup becomes even more challenging in certain situations. For the 'shopping crowd' and others, coffee is bought spontaneously and irregularly. For them the only way would be to bring the cup at all times, but that would make less sense if one occasionally buys coffee. The situation will not only depend on what type of customer you are, but also due to other factors. One of the interviewed customers, who had bought coffee in a single-use cup, described that he had to do so this morning even though he had already bought both a large and a medium reusable cup a couple of weeks before. He kept the cups at work close by, but this morning he was on his way to work and did not have time to first go to work to pick up a cup.

Another barrier for using a reusable cup that was mentioned by customers is that one may have to store a dirty cup in one's bag. Some customers do not even have a bag or anywhere else to store the cup. One of the interviewed baristas said that one time a customer kept her reusable cup in a plastic bag in her handbag. One can suspect that this rather 'unglamorous' way of drinking coffee might result in a less positive experience for some customers. Related to dirty cups is also the fact that one will have to clean it sometime/somewhere.

“I do not want spend time washing cups! There should be a system in place where one could hand in one’s dirty cup and get a new, clean one”
- Female customer (~40 years)

Overall, one can see (at least) three levels of establishing a habit of using reusable cups, based on the interviews with customers:

1. Getting a reusable cup (for the purpose of bringing it when buying coffee)

Based on this experiment, selling reusable cups at cafés is a good idea. Even if the connection to actual behaviour change is weak (‘you don’t become a runner by buying a pair of running shoes’), owning a reusable cup is first step that will be needed. If customers can find a cup that they really enjoy having their coffee in, it might also appeal to those that prioritize the drinking experience when having coffee. The decision to buy a reusable cup is possible to nudge at a café.

2. Bringing a reusable cup with you at all times

This is a habit that frequent buyers of coffee to go may want to establish (and need to, in order to buy their coffee to go in reusable cups). They can use a cup they like, and the monetary and environmental savings would increase with frequent coffee consumption. It is difficult to nudge at cafés, since the decision to bring one’s cup is not made there, but campaigns at the café might still be important incitements for establishing this habit.

3. Bringing a reusable cup with you when you know you will buy coffee to go

This is a challenging habit to establish. This entails that one cannot buy coffee spontaneously, which is something that many customers want who buys coffee more occasionally. And for frequent buyers, bringing your cup only when you know you will need it, would in practice be to bring it at all times.

5.3.3 Staff and management

The interviewed staff mostly talked about the customers, but they also spoke of the nudge consequences for themselves and the café operations. The staff did not see any large impact on their daily work:

“This is not a problem, and no extra work The only challenge was for all baristas to remember to ask the customers about the offer, I had to remind them” - Site manager/barista -

The staff could also see an additional perks with the nudge, from the café perspective:

“A sold reusable cup is also a promise that the customer will return” - Site manager/barista

While the representative from management that was interviewed were very positive towards the whole initiative, he had moderate expectations of the effects of the nudge. The main reason for this was that he knew that their customers aren't very price sensitive. Even though he liked the initiative, he could see greater possibilities if there would have been time to developed nudges that more specifically targeted their type of customers and matched with the café chain's profile. He would however have liked to see more engagement from other actors, and the customers. He felt that the responsibility to transition to reusable cups can't only be up to the cafés.

The cafés continued to offer a discount to customers bringing their own cup after the experiment had ended.

5.4 Discussion

What is it that we are nudging? The framing of any nudging or behavioural design effort has a large impact on the way it is implemented and thus the effects. In this case the difference between nudging towards an increased use of reusable to go cups or a decreased use of single-use cups can make a difference. This project has framed the choice very much as increasing the use of reusable to go cups. However, this neglects the fact that cafes already offer an excellent system for reuse: sitting at the café drinking coffee in porcelain cups, cups or glasses. They also have an effective system for washing and reusing these containers. Framing the effort in terms of reducing the number of single-use cups may have opened up a different design space. Furthermore, the decision to have coffee at the café instead of bringing it is made at the café, making this possible to nudge this in the situation where one buys coffee.

Continuing this line of thought, the implementation of the nudge (the change in choice architecture), must thus be implemented where the choice is made. The way the nudge was implemented in this project successfully nudged some people towards buying a reusable cup, but notably struggled to get customers to use such cups. Many of the customers spoken to had reusable cups at home but did not bring them. To increase the success of the project, it would have been necessary to include this decision at home in some way. It could also be possible to circumvent this decision by offering a floating reuse system, like the Recup and Rebowl which is implemented at more than 11 000 locations across Germany. Such a system, Panter, is being investigated in another pilot study taking place in Gothenburg in spring 2022 and has its own unique challenges.

From a data collection point of view, the study had limitations. First of all, it may be difficult to generalize based on the data collection from one café chain in one city. The point is however not to do this, since the experiment clearly showed how situational it is what types of nudges and initiatives that are possible to implement and may lead to success depending on the preconditions. It must however be acknowledged that the collected quantitative data also is relatively dependent on the situation. Since the sales volumes of coffee to go were so small, the fraction of sales done in reusable cups are easily affected by even a single regular customer who

decides to buy all coffees in a reusable cup. Furthermore, there is no way of knowing for sure that the data recorded in the cash registers is 100 % correct, since it was up to the sometimes quite busy staff. There is however no reason to believe that the data isn't reliable enough to draw overarching conclusions of the nudge's effects in the setting of the experiment.

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