

Technical assistance aiming at proposing a pilot
system to phase out single-use plastic bags with
pilot in Jbeil, Lebanon

Final Report
October 4th, 2019

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About

This report was developed by Sammy Kayed and Anwar Al Shami, commissioned by the Regional Activity Centre for Sustainable Development and Production (SCP/RAC) within the EU-funded project Marine Litter Med.

SCP/RAC has an official mandate from the Contracting Parties to the Barcelona Convention to engage in international cooperation with Mediterranean countries on the prevention of plastic pollution, including marine litter and on the development and innovation in the business sector.

October 2019

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The present report, including its annexes, has not been formally edited.

Introduction

Problem

Communities across Lebanon and multiple developing countries in the Middle East and North Africa (MENA) region, currently suffer from a myriad of socio-environmental issues that are intersecting and intensifying with regional instability, overstressed natural resources, dwindling biodiversity, and unprecedentedly severe pollution issues. These issues are largely driven by exploitation and under regulated consumption and production; mismanagement and malpractice by responsible authorities; and socio-political power plays. Of the many pressing environmental issues, one of the most blatant is the plastic pollution that litters lands, water ways, water bodies, coastal areas, and marine ecosystems. One of the most recklessly consumed and common types of single-use plastics are single-use polyethylene (plastic) bags. In the MENA region, numerous countries have implemented varying government policies to ban, restrict, or reduce the use of single-use bags. However, these national efforts are predominantly led and instituted with in a top down approach by government authorities. Furthermore, these policies, namely those reliant on financial incentives and disincentives, often inefficiently spend funds raised from tax schemes and miss or undervalue the opportunity to allocate funds to local sustainable development initiatives that can strengthen collective action and build an enabling environment for circular economy.

Overconsumption of single-use bags is a global phenomenon and it is suspected that Lebanon faces this issue to a severe degree. Previous to this study, there was no figure on the production of plastic bags in Lebanon or the per capita consumption. In Lebanon, high levels of plastic consumption, poor consumer disposal behaviour, and poor waste management has led to strewn single-use plastics and surges of plastic pollution during flood events have become commonplace. National studies have shown micro-plastics in 98% of networked and environmental water samples, public beaches are littered with plastic even a few weeks after beach clean up events, and plastic pollution from Lebanon is reaching the shores of numerous neighboring countries. Biodegradable plastics and paper bags are increasingly used in the country, however it is dubious whether or not this is having a positive impact on the environment given the value chain and physical nature of such single-use alternatives, the country's waste mismanagement, and evident overconsumption. When the social and environmental footprint is factored, select low-impact alternatives to single use have their place in our transition away from plastic bags but they are not the answer. The goal still needs to be on reduction of all single use and adoption of multi-use bags in consumption and production in ways that are sensitive to socio-political contexts and integrate small-holding stakeholders.

Rationale

With little governmental capacity to institute and enforce environmentally responsible measures; increasing public outcry at the severity of pollution; willingness of publics to take matters into their own hands; and a sense of local and national pride, the Lebanese context offers interesting opportunities to pilot alternative and more socio-environmentally responsible modes of

consumption and production around single-use bags. By drawing on social and economic drivers that are reliable and universal (i.e. money and community recognition) to overcome key barriers, integrated models can effectively scale horizontally while still recognizing and responding to changes in context. The work performed under this TOR enabled us to better identify what are the key concerns of stakeholder groups and support the development of a more powerful model and roadmap that is designed with and for municipal communities, enterprises, and public authorities to more organically initiate, strengthen, and catalyze policies aiming to reduce single-use bag consumption and initiate economic and social measures to reduce single-use bag consumption.

Methods for surveys and data communication

- Consumer surveys (Annex 1 and 2) and SME surveys (Annex 3 and 4) questions have been designed to be contextually sensitive and informed by previously conducted surveys on single use bags in the UK, Morocco, and the U.S.
- The Surveys were translated into English and Arabic but were administered in Arabic
- The Surveys were programmed in ODK for improved administration, data organization, statistical analysis, and data querying
- The surveys were conducted by 2 surveyors over a period of 18 days
 - The surveyors were trained in best practices for administering the survey and in how to use the ODK platform
- The consumer survey targeted consumers outside of the household that were shopping in a diversity of grocery and miscellaneous shops in Jbeil
- Given the shop type distribution in Jbeil, the SME survey targeted a variety of shops with a focus on grocery and touristic shops as the two shop types using the most single use bags
- We used the Shiny Apps package in the R software to create an online repository (further explained below) for data communication and visualization. In order to enable visualization of the data we used unique naming conventions for questions and coded the answers in a way that facilitates data analysis.
- Kindly note that some of the survey answers were rank, choose multiple, or they were subjective which makes visualization on the plotting dashboard cluttered and we are exploring ways of simplifying these answer variables.

Consumer Survey

* اي مما يلي يصف أسرتك بشكل أفضل؟

- أسرة من شخص واحد
- عائلة مع أطفال
- عائلة بلا أطفال
- متقاعد
- غير ذلك

* ما هو عمرك؟

* كم من الناس يعيشون في منزلك؟

* أين تفعل معظم التسوق البقالة الخاص بك؟

- سوبر ماركت سلسلة كبيرة
- أصغر سوبر ماركت / متجر
- متجر للأغذية الصحية
- سوق المزارعين المحليين
- متجر فواكه وخضروات
- غير ذلك

* كم مرة تتسوق لشراء البقالة؟

- كل يوم
- كل يومين
- كل 4 أيام
- مرة واحدة في الأسبوع
- مرة كل أسبوعين
- لا أشتري البقالة بانتظام

* باستخدام الأكياس البلاستيكية ذات الاستخدام الفردي ، هل تعتقد أنك تؤدي أيًا مما يلي؟

- صحة عائلتك
- البيئة المحلية
- نظافة قريتك
- النشاط السياحي من قريتك
- Other

.Specify other

* هل تعتقد أن الأكياس القابلة للتحلل هي أفضل بكثير للصحة أو البيئة أو قريتك؟

- نعم فعلا
- لا

* لماذا تعتقد أن الأكياس القابلة للتحلل هي أفضل بكثير للصحة أو البيئة أو قريتك

كم حقيبة (أكياس) استخدمتها خلال هذه الزيارة؟

* عندما تذهب للتسوق ، كم عدد المرات التي تستخدم فيها الأكياس ذات الاستخدام الواحد التي يوفرها المتجر؟

- أبدا
- نادرا
- بعض الأحيان
- غالبيا
- دائما
- غير متأكد

* ماذا تفعل بالأكياس ذات الاستخدام الواحد عند إحضارها إلى المنزل؟

- كأكياس قمامة
- رميها مباشرة
- لعوادم كلب / قط / حيوانات الأليفة
- إعادة استخدامها للتسوق
- Other

.Specify other

* إذا أحضرت أكياسك الخاصة إلى السوبر ماركت ، فما نوعها؟

- حقيبة بلاستيكية قابلة لإعادة الاستخدام
- كيس من البلاستيك العادي
- الحقيبة القابلة لإعادة الاستخدام التي تقدمها بلدية جبيل
- كيس القماش
- حاوية أخرى أو كيس

* لماذا لا تحضر دائماً أكياسك عند التسوق؟

- نسيت أن أحضرهم
- عندما أخرج حقيبة مستعملة أشعر بالحرج
- المتجر الذي أشتريه لن يحزم طعامي في أكياس / حاويات قابلة لإعادة الاستخدام
- ليس من السهل بالنسبة لي الحصول على أكياس قابلة لإعادة الاستخدام حيث أذهب للتسوق
- تكلفة أكياس قابلة لإعادة الاستخدام
- انها ليست عملية
- لقد استخدمت كل الاكياس لأشياء أخرى في منزلي
- ليس شيئاً أهتم به
- Other

.Specify other

* ما الذي يجعلك تشعر أن إحضار أكياسك القابلة لإعادة الاستخدام هي فكرة جيدة؟

- العلم أنك تقوم بتحسين بيئة قرينتك؟
- العلم أنك تعمل على تحسين الشعور باللحمة الاجتماعية في قرينتك؟
- العلم أنك تقلل من القمامة في قرينتك؟
- العلم أنك قد تكافأ مع السلع المنزلية التي تريدها؟
- العلم أنك قد تدخل اليانصيب للفوز بعطلة أو عنصر رئيسي آخر؟

* إذا تم تزويدك بشيء لمساعدتك على تذكر احضار أكياسك القابلة لإعادة الاستخدام ، فأين يجب وضعه؟

معلقة في داخل الباب الأمامي الخاص بك

داخل سيارتك

على هاتفك

على عربة / سلة التسوق

في موقف السيارات في موقع التسوق

عند الباب الأمامي لموقع التسوق

مغناطيس الثلاجة

Other

.Specify other

* هل تعتقد أنه من الجيد إجبار جميع محلات السوبر ماركت على فرض رسوم على الأكياس ذات الاستخدام الواحد؟

نعم

لا

* لماذا لا تعتقد أنه من الجيد إجبار جميع محلات السوبر ماركت على فرض رسوم على الأكياس ذات الاستخدام الواحد؟

* إذا كنت تعتقد أنها فكرة جيدة ، فهل سيجعلك ذلك أكثر عرضة لجلب أكياسك القابلة لإعادة الاستخدام؟

نعم

لا

* لماذا لا يجعلك هذا أكثر عرضة لجلب حقائبك القابلة لإعادة الاستخدام؟

* إذا تم فرض رسوم على الأكياس البلاستيكية في جميع الأسواق ، فما المبلغ الذي تقبل بدفعه لكل كيس للاستخدام الفردي؟

50 ل.ل.

100 ل.ل.

250 ل.ل.

500 ل.ل.

1000 ل.ل.

* ما الذي يجعلك تشعر براحة أكبر في دفع رسوم رمزية للحقائب ذات الاستخدام الواحد؟

- معرفة ان الرسوم سوف تذهب إلى صندوق لدعم مبادرة محلية من اختيارك؟
- معرفة ان الرسوم تساعد في تحسين الأعمال التجارية في السوق الذي تختاره؟
- العلم أنك تضرب مثالا للآخرين؟
- العلم أنك تقوم بتحسين بيئة قرينك؟
- العلم انك تقلل من القمامة في قرينك؟

* كيف ينبغي لمجتمعك أن يتفق الدخل الإضافي الناتج عن رسوم الحقيبة ذات الاستخدام الواحد؟

- لإضافة إلى أرباح المحلات التجارية؟
- لتخفيض سعر البضائع؟
- إرسالها إلى البلدية؟
- إرسالها مباشرة إلى المشاريع المحلية لتحسين بيئة القرية؟
- إرسالها مباشرة إلى المشاريع المحلية التي تجعل قرينك أكثر جمالا؟

* هل لديك مشروع محدد تود تنفيذه في قرينك؟

- نعم
- لا

* إذا كانت الإجابة بنعم، ما هو؟

* ما هي مخاوفك بشأن فرض رسوم على الحقائب ذات الاستخدام الواحد لجميع المتاجر؟

* من أو ما رأيك يؤثر عليك أكثر؟ (ترتيب)

عائلة	::
اصحاب	::
الجيران / المجتمع المحلي	::
وسائل الإعلام التلفزيون / وسائل التواصل الاجتماعي	::
المشاهير	::
Other	::

.Specify other

يرجى تقديم أي تعليقات / أفكار إضافية قد تكون لديكم.

* موقعك



(° latitude (x,y

(° longitude (x,y

(altitude (m

(accuracy (m

Consumer Survey

Which of the following best describes your household?

- Single household
- Family with children
- Family without children
- Retired
- Other

What is your age?

How many people live in your household?

Where do you do most of your grocery shopping?

- Big chain supermarket
- Smaller supermarket/convenience store
- Health food shop
- Local farmers market
- Fruit and veggie shop
- Other (please specify)

How often do you shop for groceries?

- Every day
- Every 2 days
- Every 4 days
- Once per week
- Once every two weeks
- I don't buy groceries regularly

By using single-use-plastic bags do you think you are harming any of the below?

- Your family's health
- The local environment
- The cleanliness of your village
- The tourist appeal of your village
- Other

Specify other.

Do you think biodegradable bags are considerably better for health, the environment or your village?

- Yes
- No

Why you think biodegradable bags are considerably better for health, the environment or your village

How many bag(s) did you USE during this visit?

When you go shopping, how often do you use rely use bags?

- Never
- Rarely
- Sometimes
- Often
- Always
- Unsure

What do you do with single use bags when you bring them home?

- As a garbage bag
- Throw them away directly
- For dog / cat / pet mess
- Reuse for shopping
- Other

Specify other.

If you bring your own bag(s) to the supermarket, what type(s) are they?

- Thick reusable plastic bag
- Normal plastic bag
- The reusable bag provided by the Jbeil Municipality
- Non-woven/ cotton renewable bag
- Other container or bag

Why don't you always bring your own bags when shopping?

- I forget to bring them
- When I take out a used bag I feel embarrassed
- The store I purchase from won't pack my food in reusable bags/containers
- It's not easy for me to get reusable bags where I go shopping
- The cost of the reusable bags
- It's not convenient
- I used all of the bags for other things in my home
- It's not something I care to do
- Other

Specify other.

What would cause you to feel bringing your own reusable bag is a good idea?

- Knowing you are improving the environment of your village?
- Knowing you are improving the sense of community in your village?
- Knowing you are reducing litter in your village?
- Knowing you may be rewarded with household goods that you want?
- Knowing you may enter a lottery to win a vacation or other major item?

If you were provided with something to help you remember to bring your own Bag or container, where should it be placed?

- Hanging on the inside of your front door
- Inside your car
- On your phone as a notification
- On the shopping trolley/basket
- In the carpark of the shopping location
- At the front door of the shopping location
- Fridge magnet
- Other

Specify other.

Do you think it's a good idea to force all supermarkets to charge for single use bags?

- Yes
- No

Why don't you think it's a good idea to force all supermarkets to charge for single use bags?

If you think it's a good idea, would this make you more likely to bring your own reusable bag?

- Yes
- No

Why wouldn't this make you more likely to bring your own reusable bag?

If a plastic bag charge is introduced to all markets, how much would you be willing to pay per single use bag?

- 50 LLB
- 100 LLB
- 250 LLB
- 500 LLB
- 1000 LLB

What would cause you to feel most comfortable in paying a small fee for single use bags?

- Knowing the fee would go to a fund to support a local initiative of your choosing?
- Knowing the fee is helping improve the business of your choice market?
- Knowing you are setting an example for others?
- Knowing you are improving the environment of your village?
- Knowing you are reducing litter in your village?

How should your community spend the extra income generated by the single use bag charge?

- To add to the profits of shops?
- To reduce the price of goods?
- Send it to the municipality?
- Send it directly into local projects to improve the village's environment?
- Send it directly into local projects that make your village more beautiful?

Do you have a specific project you would like to see implemented in your village?

- Yes
- No

What is the project you would like to see implemented in your village?

What concerns do you have about introducing a charge on single use bags for all shops?

Who or what do you think influences you the most? (order)

:: Family
:: Friends
:: Neighbours/local community
:: Media Tv/Social Media
:: Celebrities and Famous People
:: Other

Click to start

Specify other.

Please provide any additional comments/ideas you may have.

Location

latitude (x.y °)

longitude (x.y °)

altitude (m)

accuracy (m)



MSME survey*** نوع المحل**

- بقالة
- خضار و فاكهة
- متنوع
- سياحي
- Other

.Specify other

*** مساحة سطح المحل (متر مربع)**

*** عدد الموظفين في المحل**

*** نوع الاكياس ذات الاستخدام الواحد هل تعتمد عليها؟**

- بلاستيك
- قابلة للتحلل ، D2W
- ورق
- قابل للتسيخ
- Other

.Specify other

*** ما هي احجام الاكياس البلاستيكية التي تستخدمها**

- صغير
- متوسط
- كبير
- Other

.Specify other

* وزن الاكياس الصغيرة التي تستخدمها شهريا

* وزن الاكياس المتوسطة التي تستخدمها شهريا

* وزن أكياس كبيرة تستخدمها شهريا

* وزن الاكياس الأخرى التي تستخدمها شهريا

* كم تدفع لكل كيلو غرام من الأكياس الصغيرة؟

* كم تدفع لكل كيلو غرام من الأكياس المتوسطة؟

* كم تدفع لكل كيلو غرام من الأكياس الكبيرة؟

* كم تدفع لكل كيلو غرام من الاكياس الأخرى؟

* كم عدد الأكياس الصغيرة الموجودة في كل كيلو غرام؟

* كم عدد الاكياس المتوسطة في كل كيلو غرام؟

* كم عدد الاكياس الكبيرة في كل كيلو غرام؟

* كم عدد الاكياس الأخرى في كل كيلو غرام؟

* هل تعتقد أنها فكرة جيدة ان تعمل جميع المتاجر معا لاستيفاء عمولة مقابل الاكياس ذات الاستخدام الواحد؟

نعم

لا

* لماذا لا تعتقد أنها فكرة جيدة ان تعمل جميع المتاجر معا لاستيفاء عمولة مقابل الاكياس ذات الاستخدام الواحد؟

* إذا تم فرض رسوم على الاكياس البلاستيكية ، فكم تعتقد أن العملاء سيكونون على استعداد للدفع لكل كيس استخدام واحد؟

LLB 50

LLB 100

LLB 250

LLB 500

LLB 1000

* نظرا لأن 250LLB هي اصغر عملة متوفرة ، هل تعتقد أنه سيكون من الأفضل تحصيل رسوم لكل استخدام واحد أو رسم محدد لكل معاملة؟
لكل معاملة بزيادة 250LLB. وهذا يعني لمعاملة ما بين LLB 250 و LLB 25,000 ، رسم 250LLB - للمعاملة بين LLB 25,000 و LLB 50,000 ، رسم 500LLB -
والمعاملة بين LLB 50,000 و LLB 75,000 ، رسم 750LLB.

لكل كيس

لكل معاملة

* لماذا لا تظن أنه سيكون من الأفضل فرض رسوم محددة للعملاء على كل معاملة؟

لكل معاملة بزيادة 250LLB. وهذا يعني لمعاملة ما بين LLB 250 و LLB 25,000 ، رسم 250LLB - للمعاملة بين LLB 25,000 و LLB 50,000 ، رسم 500LLB -
والمعاملة بين LLB 50,000 و LLB 75,000 ، رسم 750LLB.

* ما الذي قد يجعلك تشعر بمزيد من الراحة في فرض رسوم رمزية على عملائك مقابل الاكياس ذات الاستخدام الواحد؟

العلم أنه سيفر ويولد المال لمتجرك؟

العلم أنك تضرب مثالا للمتاجر والقرى الأخرى؟

العلم أنك تقلل من القمامة في قرينك؟

العلم أنك تقوم بتحسين جاذبية قرينك السياحية؟

* هل لديك أكياس قابلة لإعادة الاستخدام متوفرة في متجرك؟

نعم

لا

* أي نوع من الاكياس القابلة لإعادة الاستخدام متوفرة؟

* ما هو سعر الاكياس القابلة لإعادة الاستخدام (LBP)؟

هل تفعل أي شيء آخر للحد من استهلاك الاكياس ذات الاستخدام الواحد في متجرك؟

ما رأيك ينبغي القيام به على مستوى المستهلك والمستوى البلدي والمستوى الوطني للحد من استهلاك الاكياس ذات الاستخدام الواحد؟

* موقعك



(° latitude (x.y

(° longitude (x.y

(altitude (m

(accuracy (m

MSME survey

Type of shop

- Grocery
- Produce only
- Miscellaneous
- Touristic
- Other

Specify other.

Surface area of the shop (square meters)

Number of employees at the shop

What kind of single use bags do you rely on?

- Plastic
- Biodegradable, d2w
- Paper bag
- Compostable bag
- Other

Specify other.

What size of plastic bag do you use

- Small
- Medium
- Large
- Other

Specify other.

Weight of small bags you use per month

Weight of medium bags you use per month

Weight of large bags you use per month

Weight of other bags you use per month

How much do you pay per KG of small bags?

How much do you pay per KG of medium bags?

How much do you pay per KG of large bags?

How much do you pay per KG of other bags?

How many small bags are in each KG?

How many medium bags are in each KG?

How many large bags are in each KG?

How many other bags are in each KG?

Do you think it's a good idea if all shops are mandated to work together and charge customers for single use bags?

- Yes
 No

Why don't you think it's a good idea if all shops are mandated to work together and charge customers for single use bags?

If a plastic bag charge is introduced, how much do you think customers would be willing to pay per single use bag?

- 50 LLB
 100 LLB
 250 LLB
 500 LLB
 1000 LLB

Given 250LLB is the smallest available coin, do you think it would be better to charge customers per bag or a set fee per transaction?

Per transaction in increments of 250LLB. that is to say for a transaction between 250 LLB and 25,000 LLB a fee of 250LLB, for a transaction between 25,000 LLB and 50,000 LLB a fee of 500LLB, and for a transaction between 50,000 LLB and 75,000 LLB a fee of 750LLB.

- Per bag
 Per transaction

why don't you think it would be better to charge customers a set fee per transaction?

Per transaction in increments of 250LLB. that is to say for a transaction between 250 LLB and 25,000 LLB a fee of 250LLB, for a transaction between 25,000 LLB and 50,000 LLB a fee of 500LLB, and for a transaction between 50,000 LLB and 75,000 LLB a fee of 750LLB.

What would cause you to feel more comfortable in charging your customers a small fee for single use bags?

- Knowing it would save and generate money for your shop?
 Knowing you are setting an example for other shops and villages?
 Knowing you are reducing litter in your village?
 Knowing you are improving the tourist appeal of your village?

Do you have reusable bags available at your shop?

- Yes
 No

Which type of reusable bags are available?

What is the average cost per reusable bags (LBP)?

Are you doing anything else to reduce the consumption of single use bags in your shop?

What do you think should be done at the consumer, municipal or national level to reduce the consumption of single use bags?

Location

latitude (x.y °)

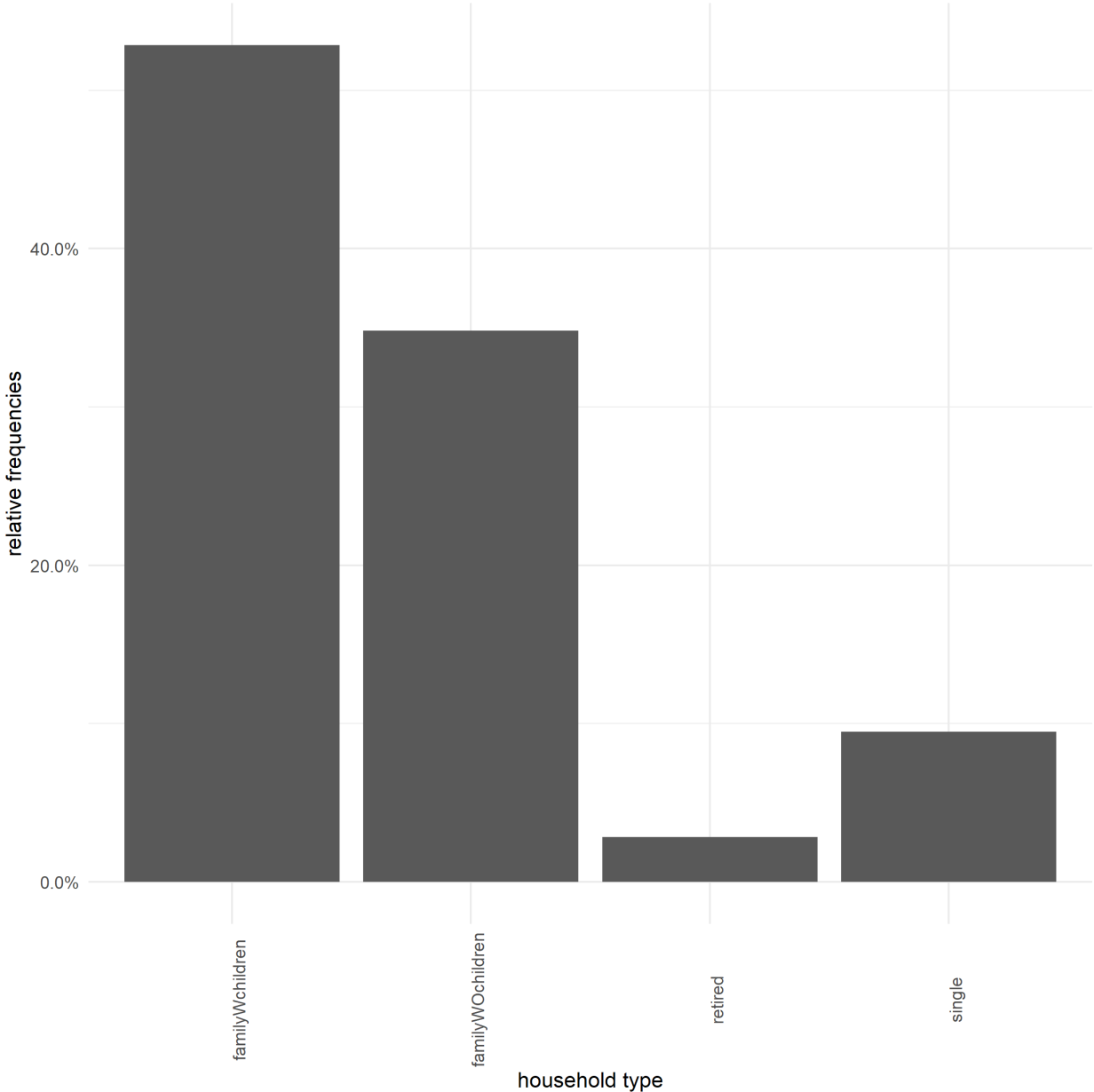
longitude (x.y °)

altitude (m)

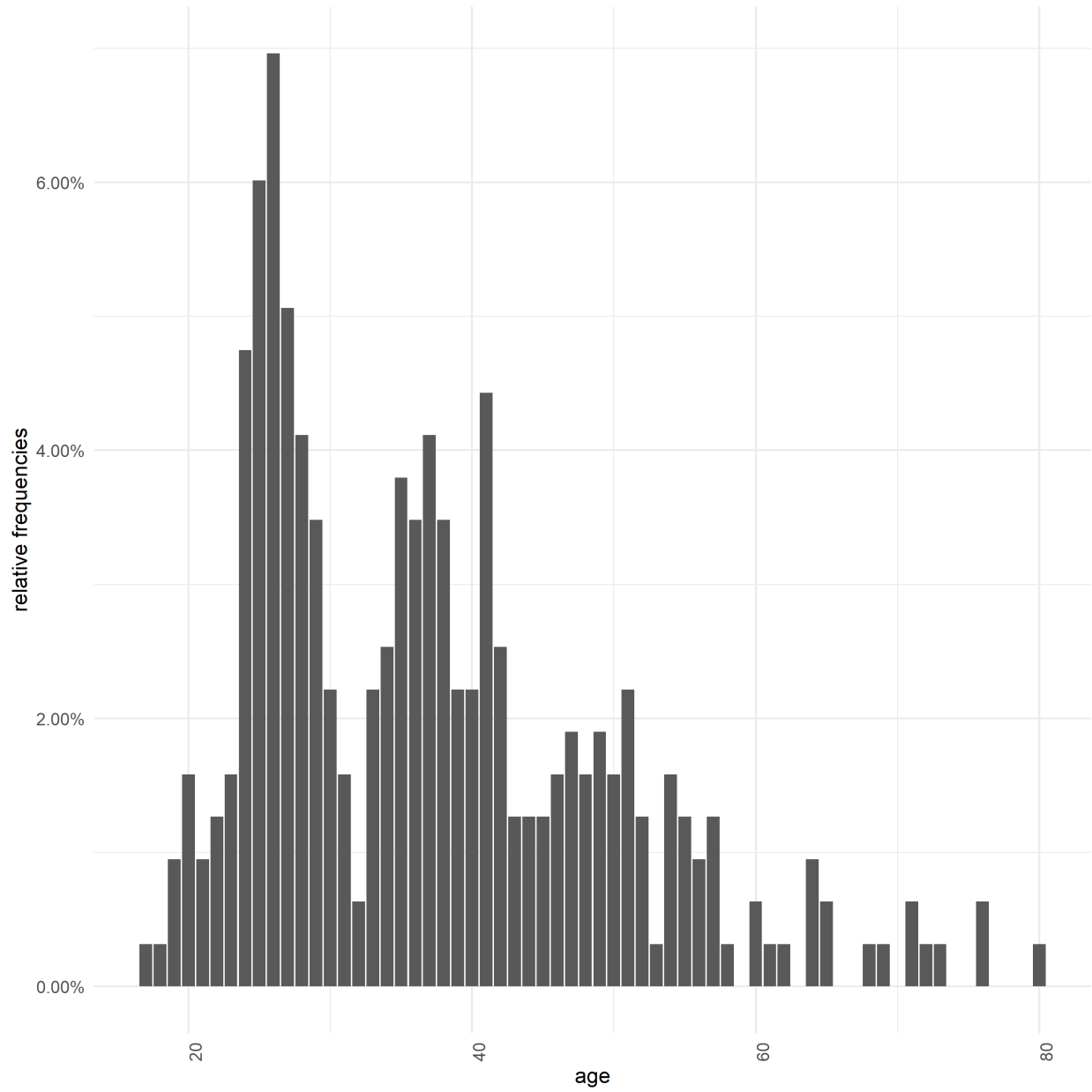
accuracy (m)



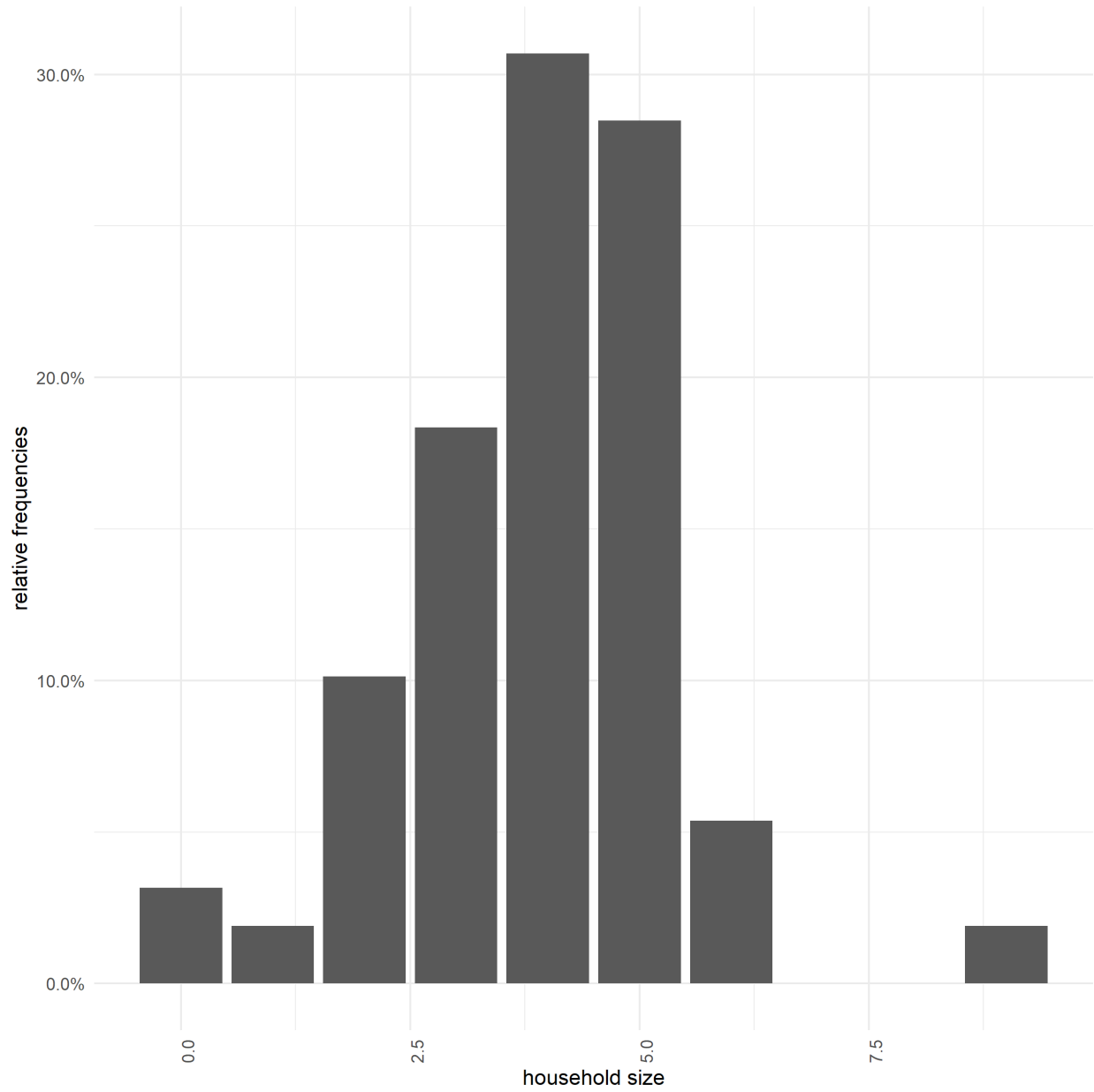
Graphs and findings of consumer surveys



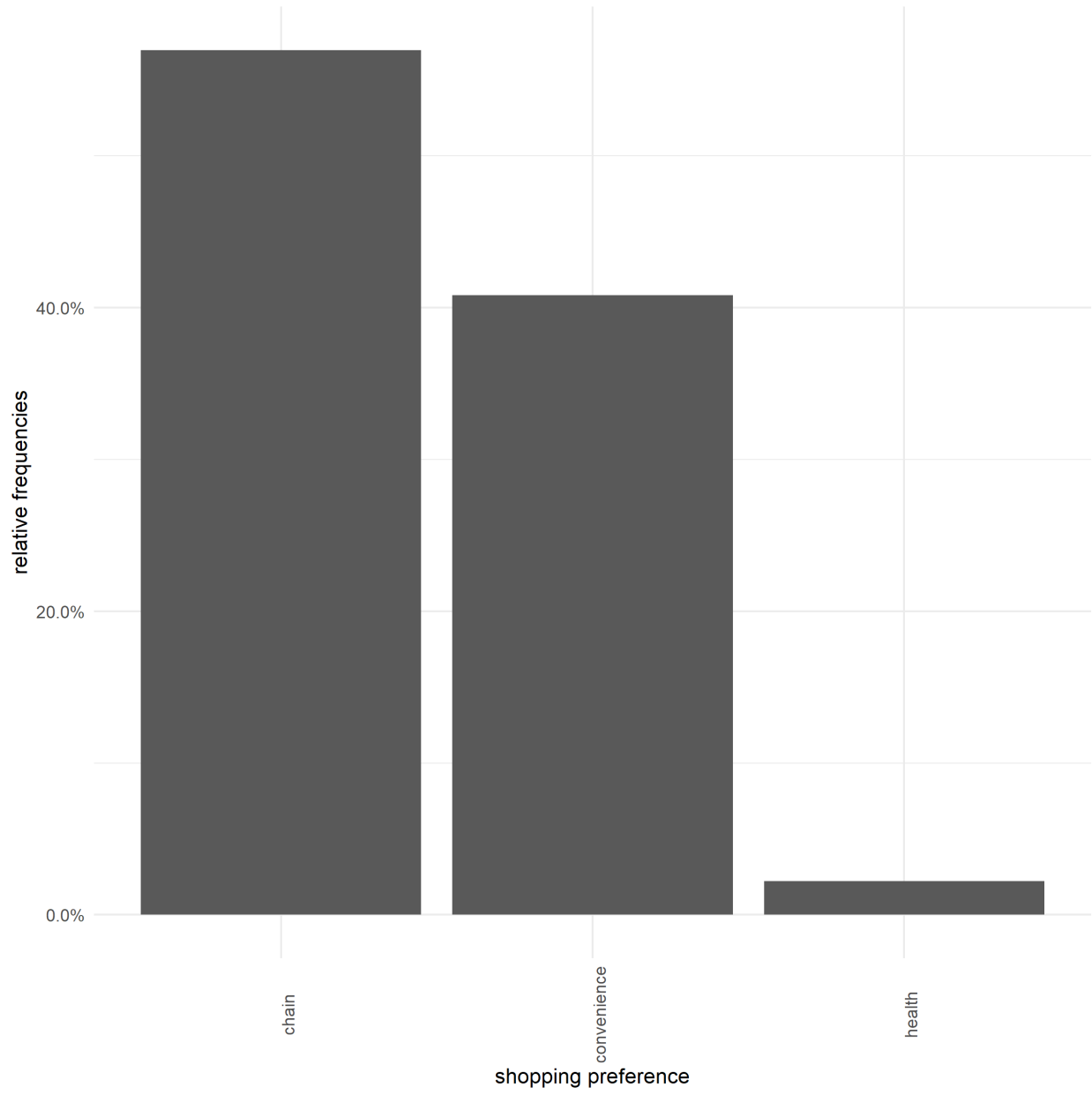
- More than 80% of surveyed consumers are from a family household



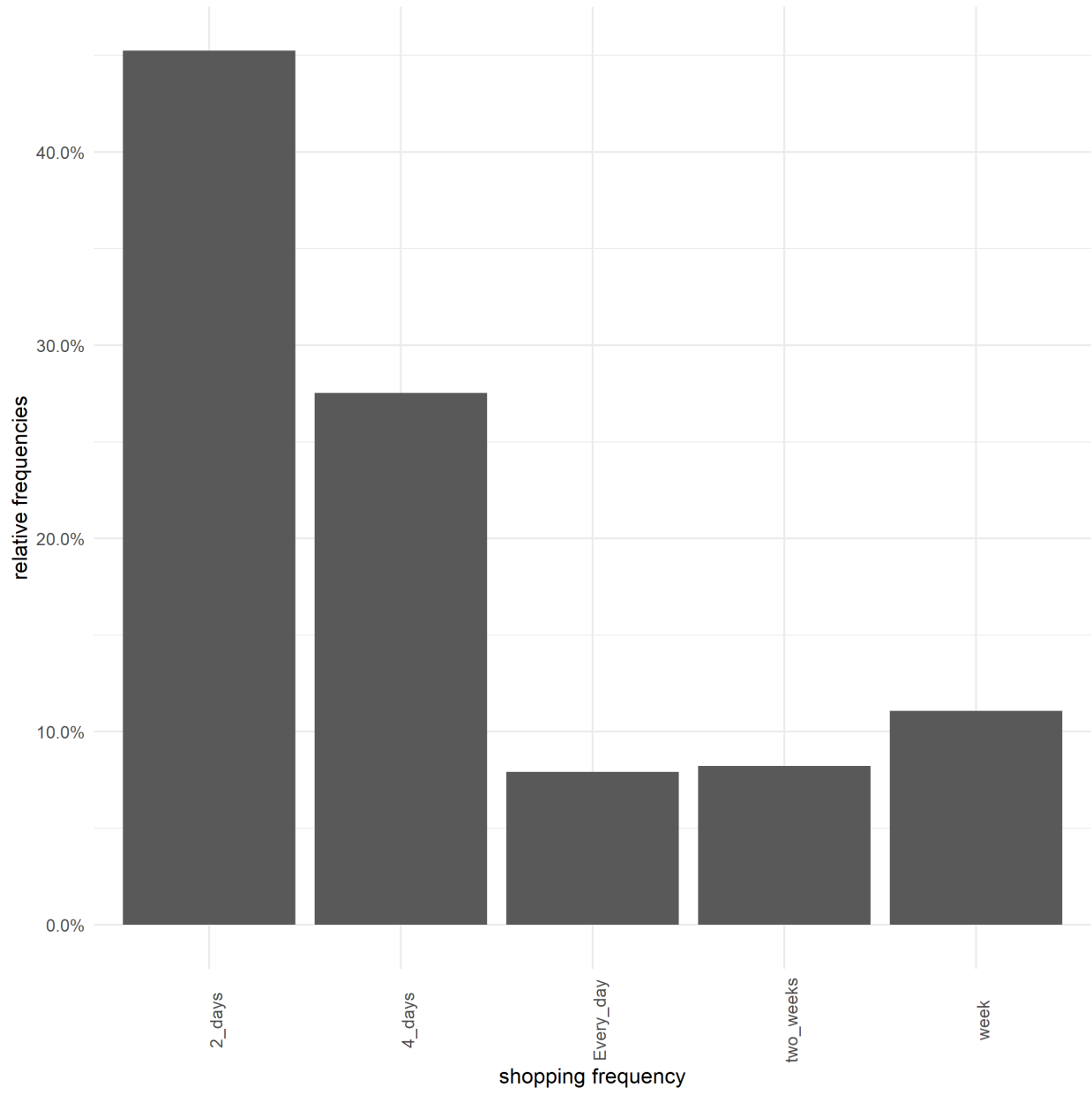
- The majority of the surveyed consumers are between 23 and 44 years old



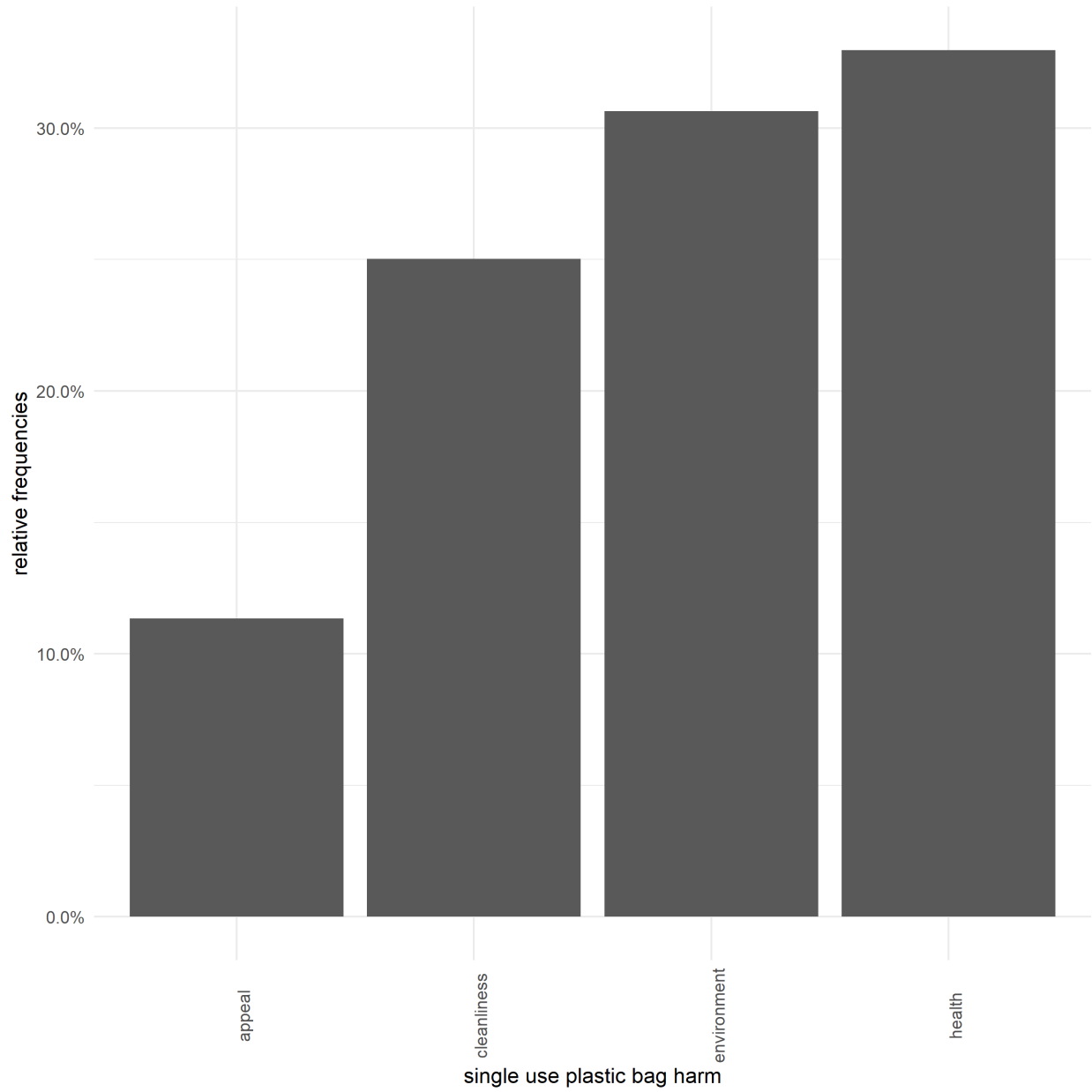
- 85% of the consumers surveyed are from a household with 2 and 6 people



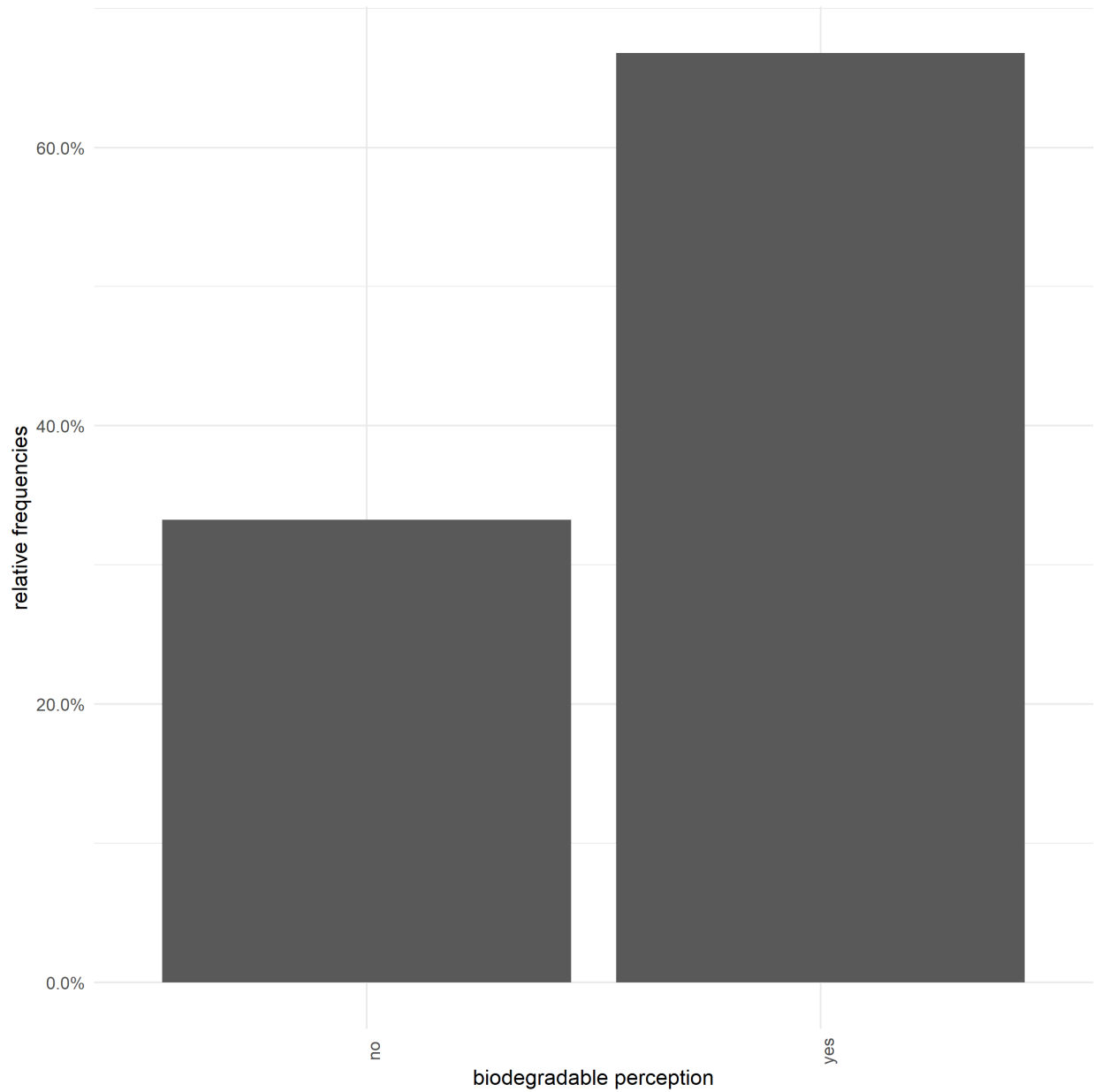
- 89% of the consumers surveyed shop in either chain or convenience stores



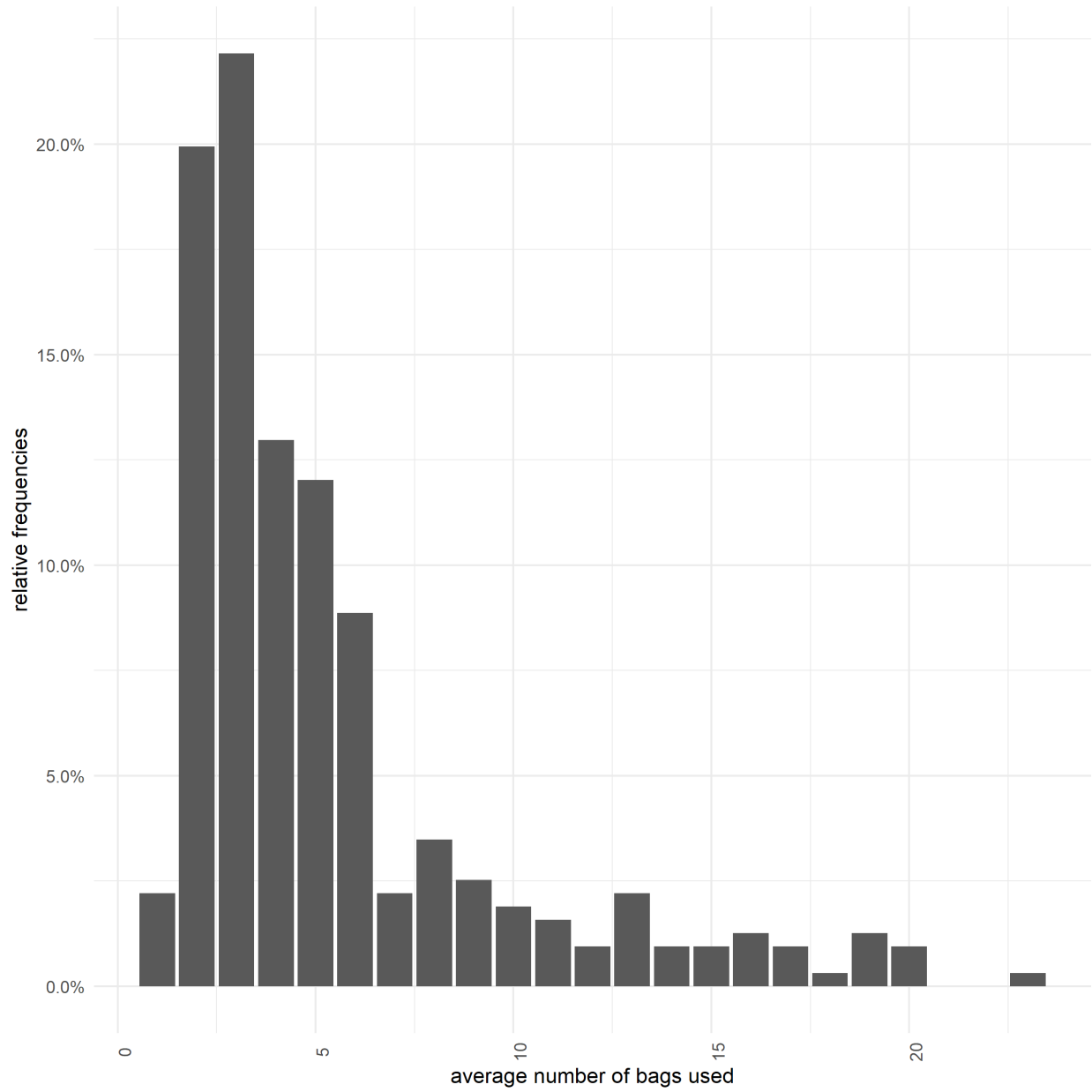
- 72% of the surveyed consumers shop every 2 or 4 days



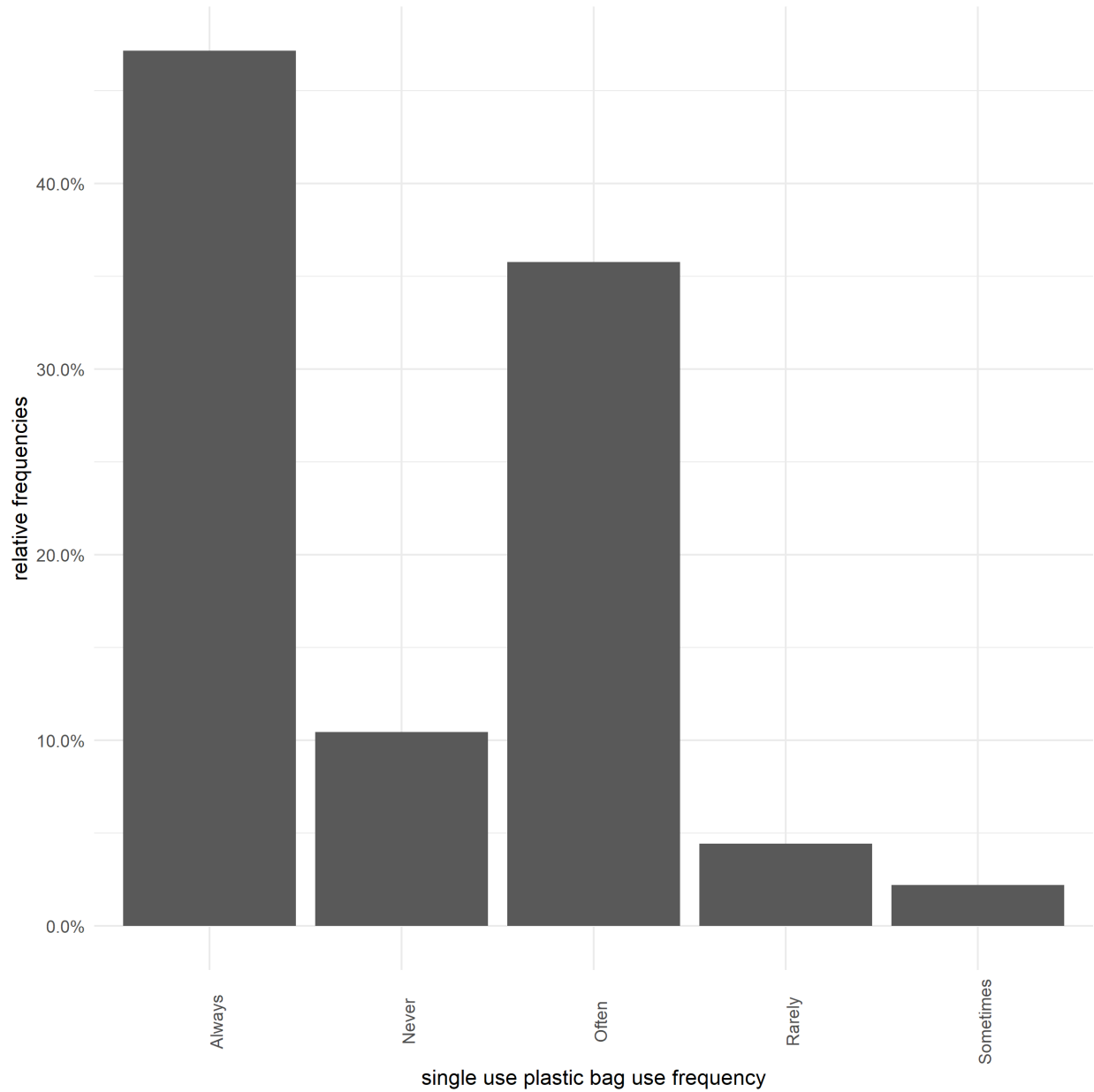
- Environment and health ranked the highest in the perceived harm that single use plastic bags cause



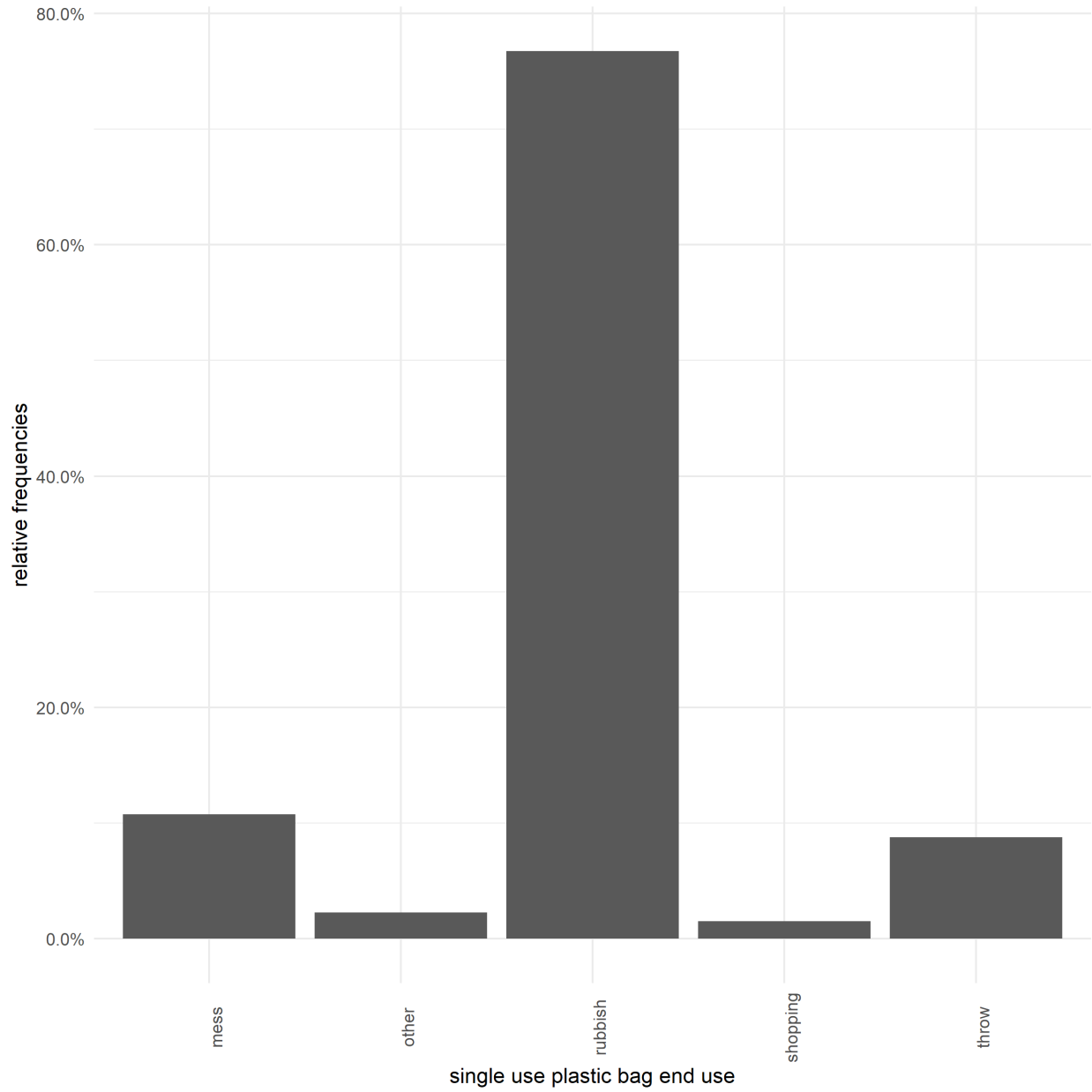
- More than 80% of surveyed consumers believe that d2w bags are better for the environment than the PE bags. Given the expert consensus on d2w this is not believed to be true and false claims on d2w bags need to be tackled with awareness campaigns on the harms of d2w



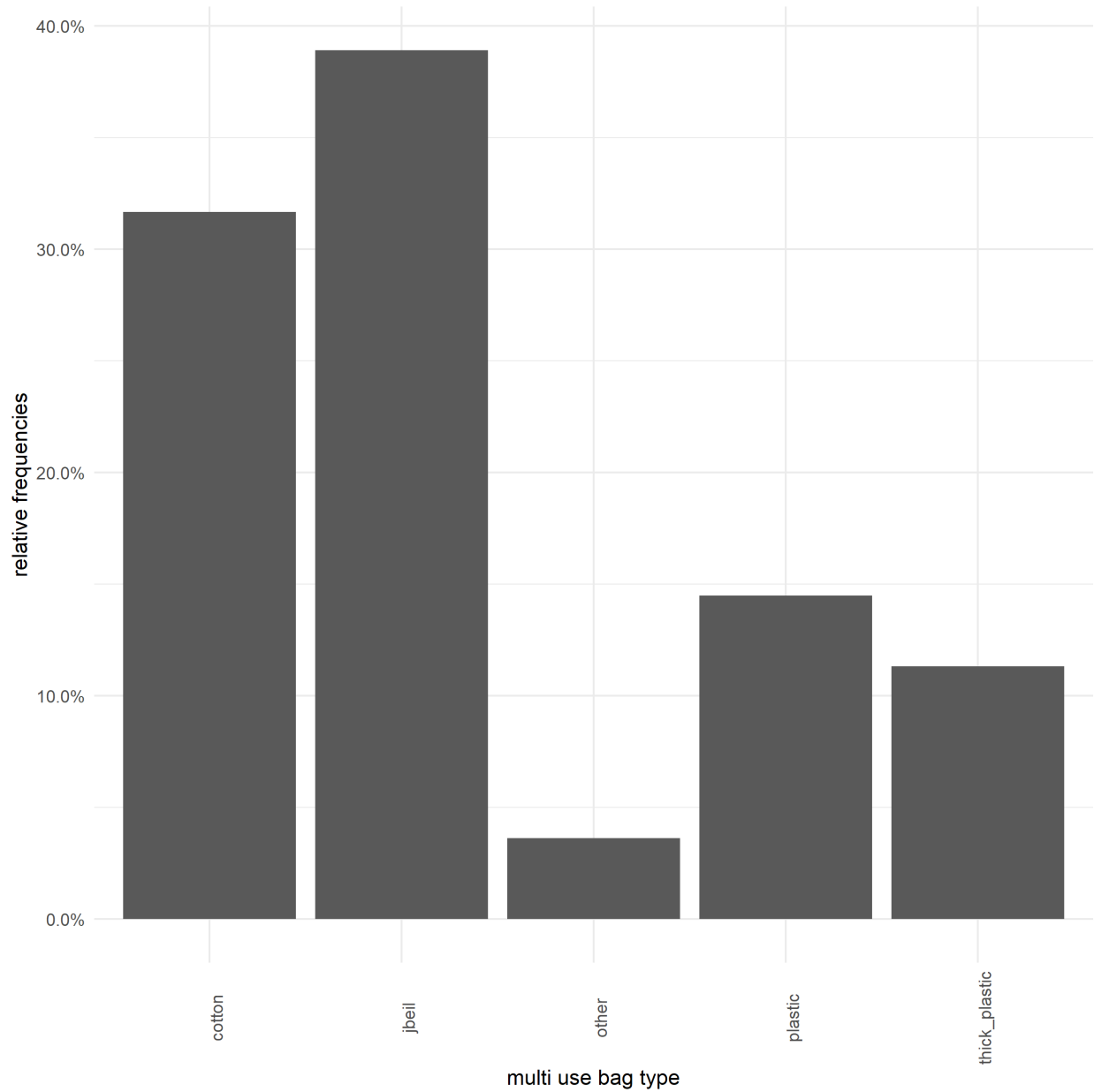
- 76% of consumers surveyed report that they use between 2 and 6 bags per shopping trip



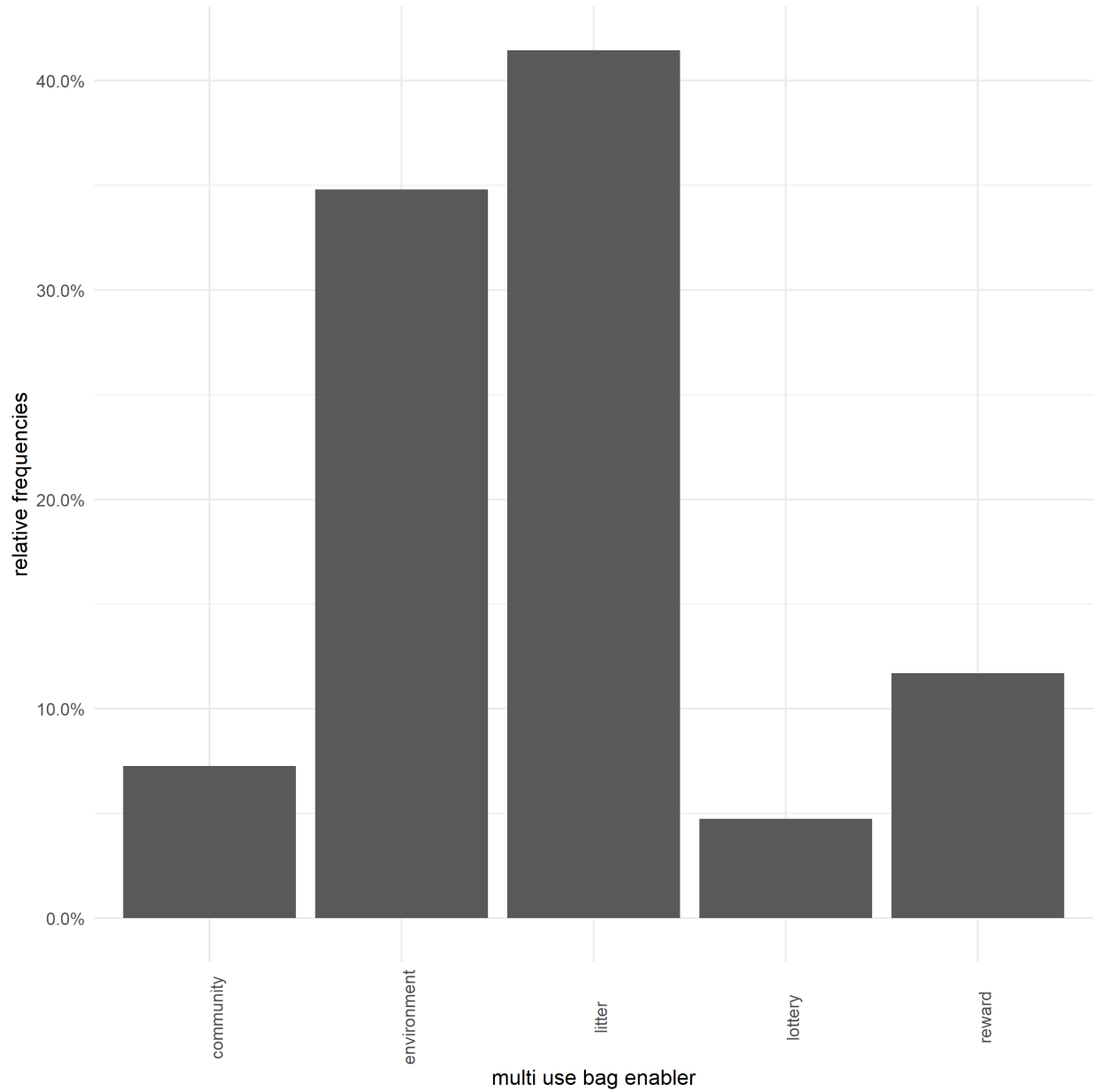
- Only around 20% of the population does not consistently use single use plastic bags but the municipality and consultations with shop owners suggests the true value is lower since they report hardly anyone brings their own bags.



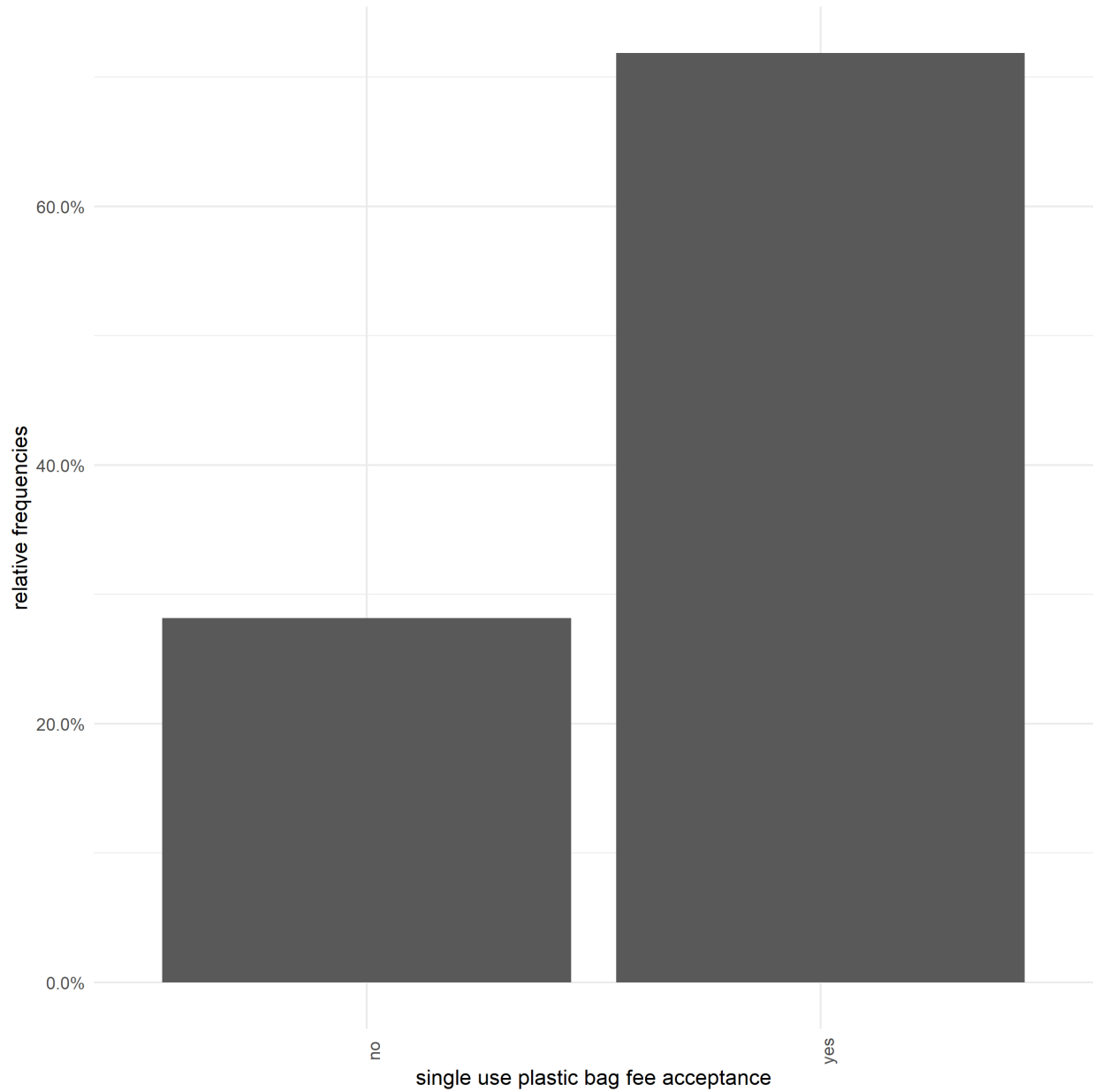
- For an overwhelming majority of surveyed consumers, single use plastic bags are reused as trash bags in the household.



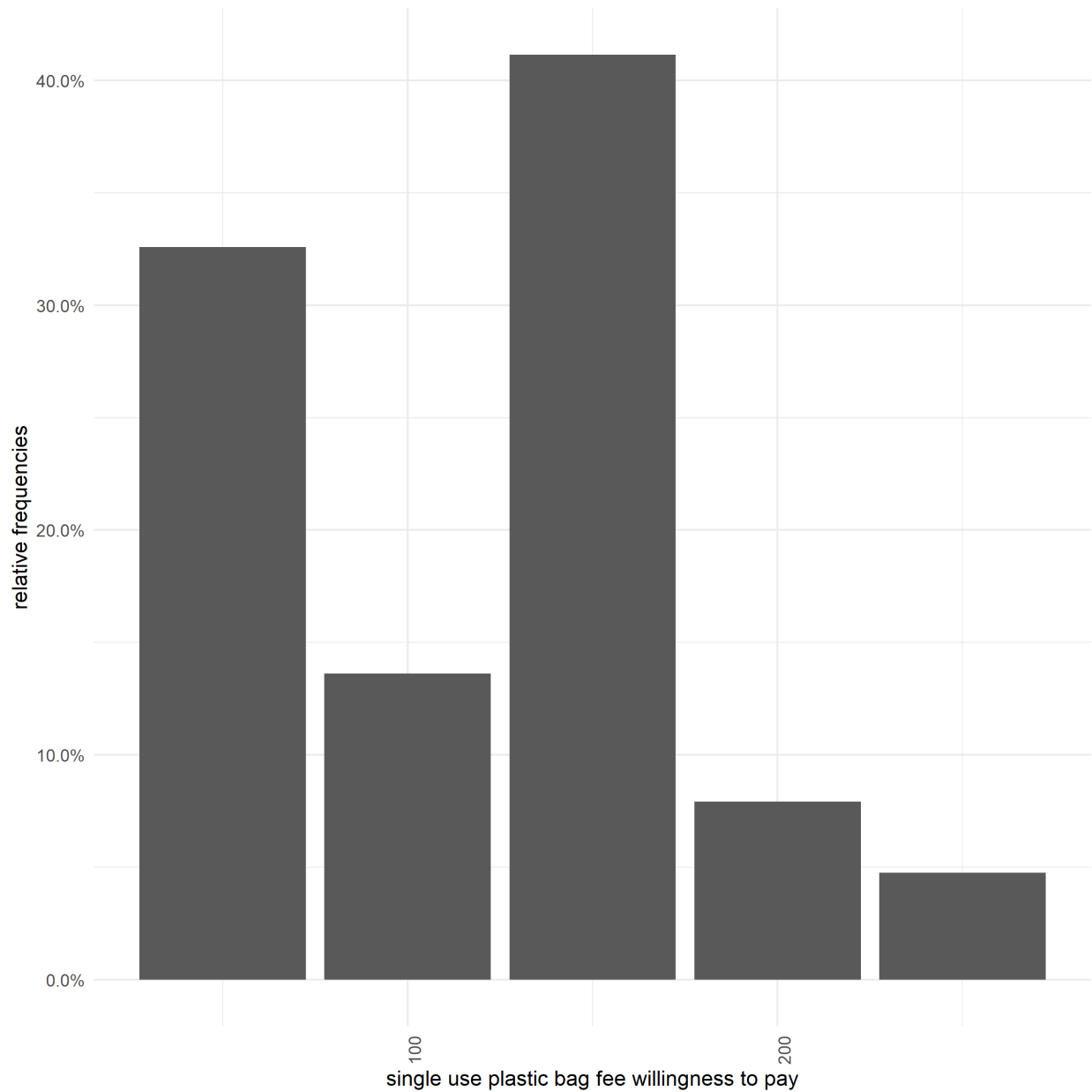
- In this check all that apply question, most of the multi use bags that are used are either cotton tote bags or the bags provided by the Jbeil municipality which are non-woven polypropylene bags



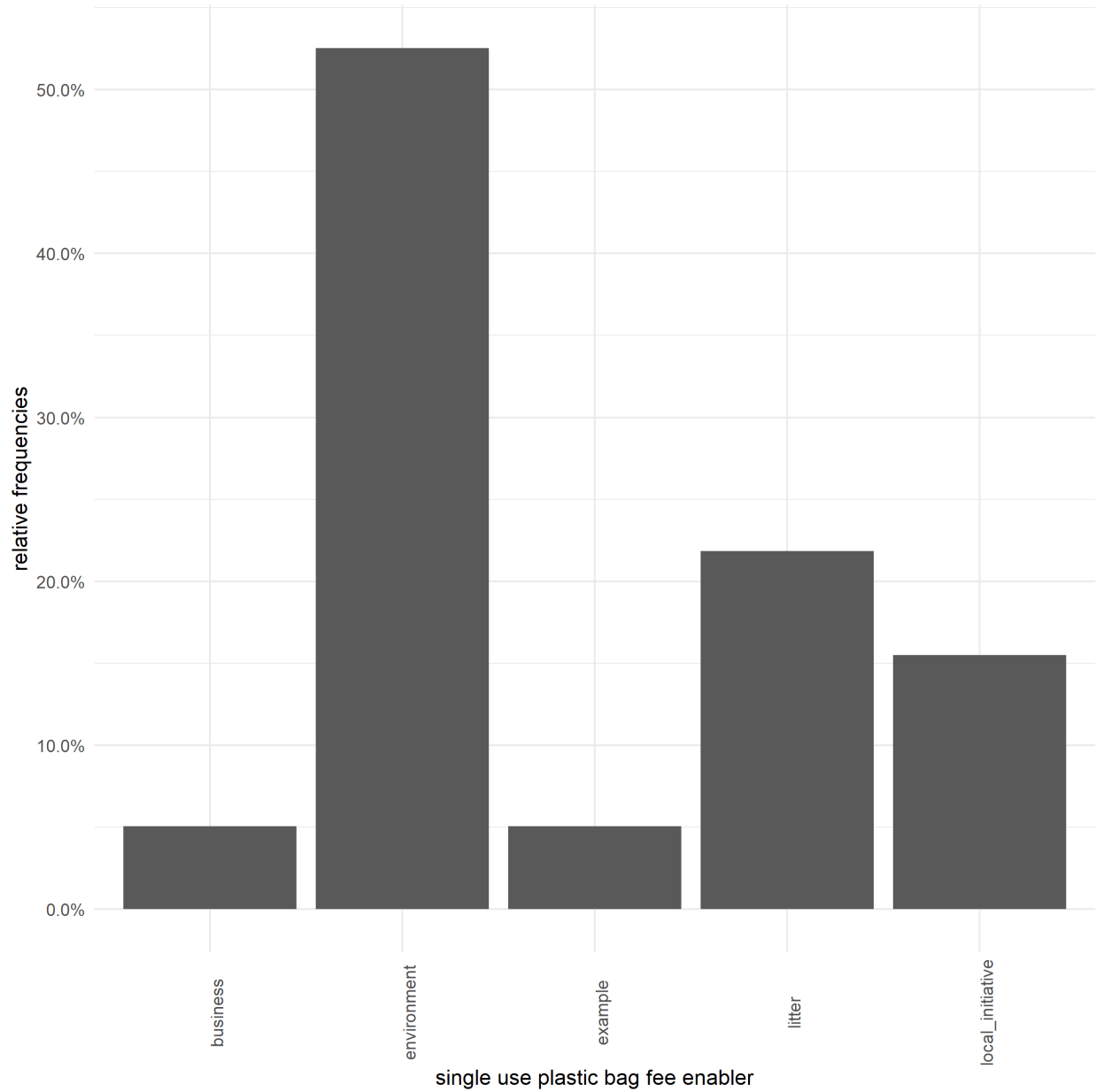
- Around 80% of respondents believe that what would drive them towards multi use bags are concerns over litter and the environment. This question required a description of the community fund model which was not given.



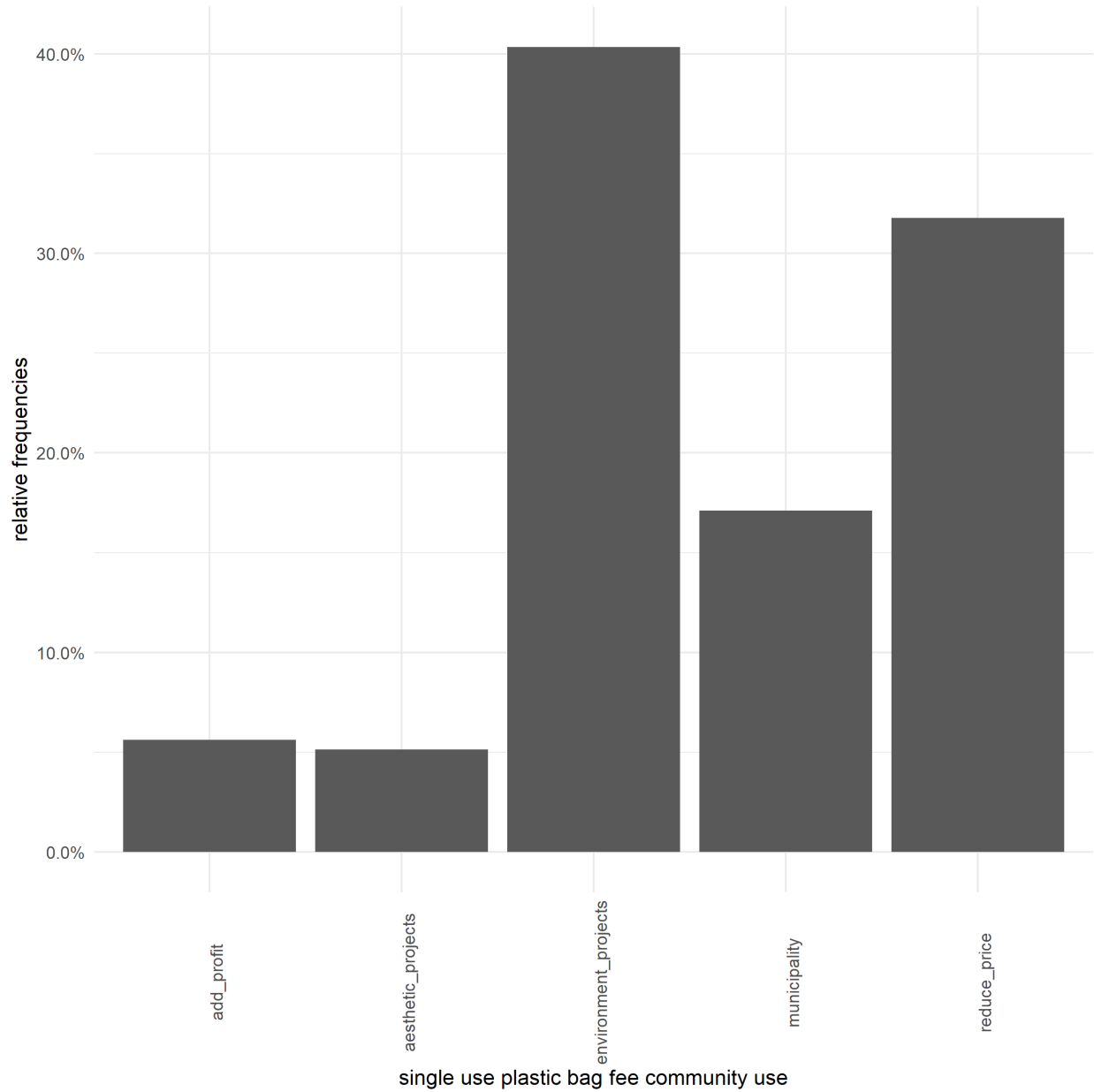
- It was very interesting to see that more than 70% of the respondents are willing to pay a fee for single use bags. The survey with SMEs, found that shops believe the majority of people are not willing to pay which is an important difference in perceptions between consumers and shops.



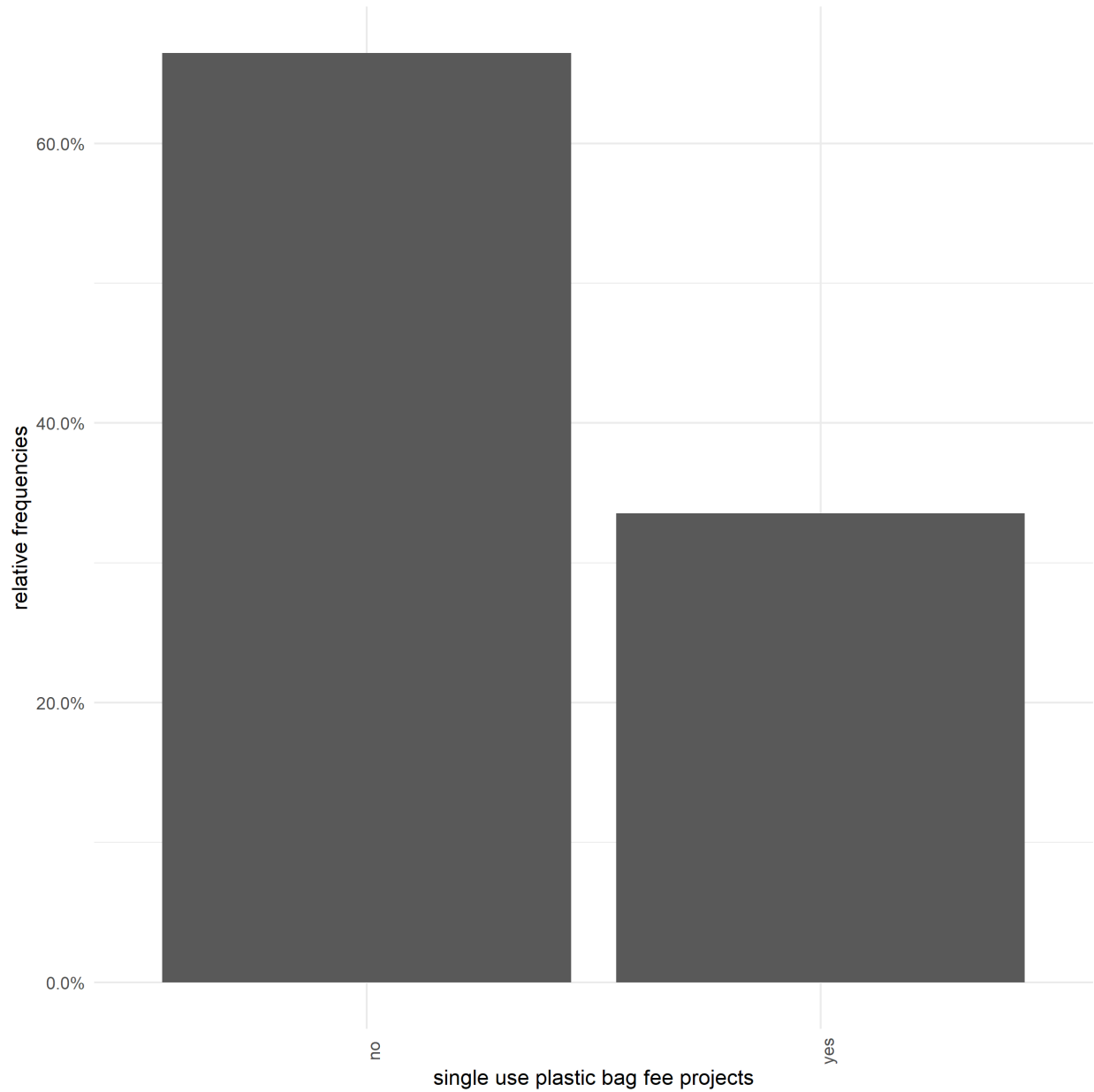
- Consumers reported a willingness to pay between 50 and 150 LLB per bag which is well suited to the 100LLB charge being put forward by franchises and to the average charge of 100LLB for a transaction based tax as initially proposed by the UNCLOG team.



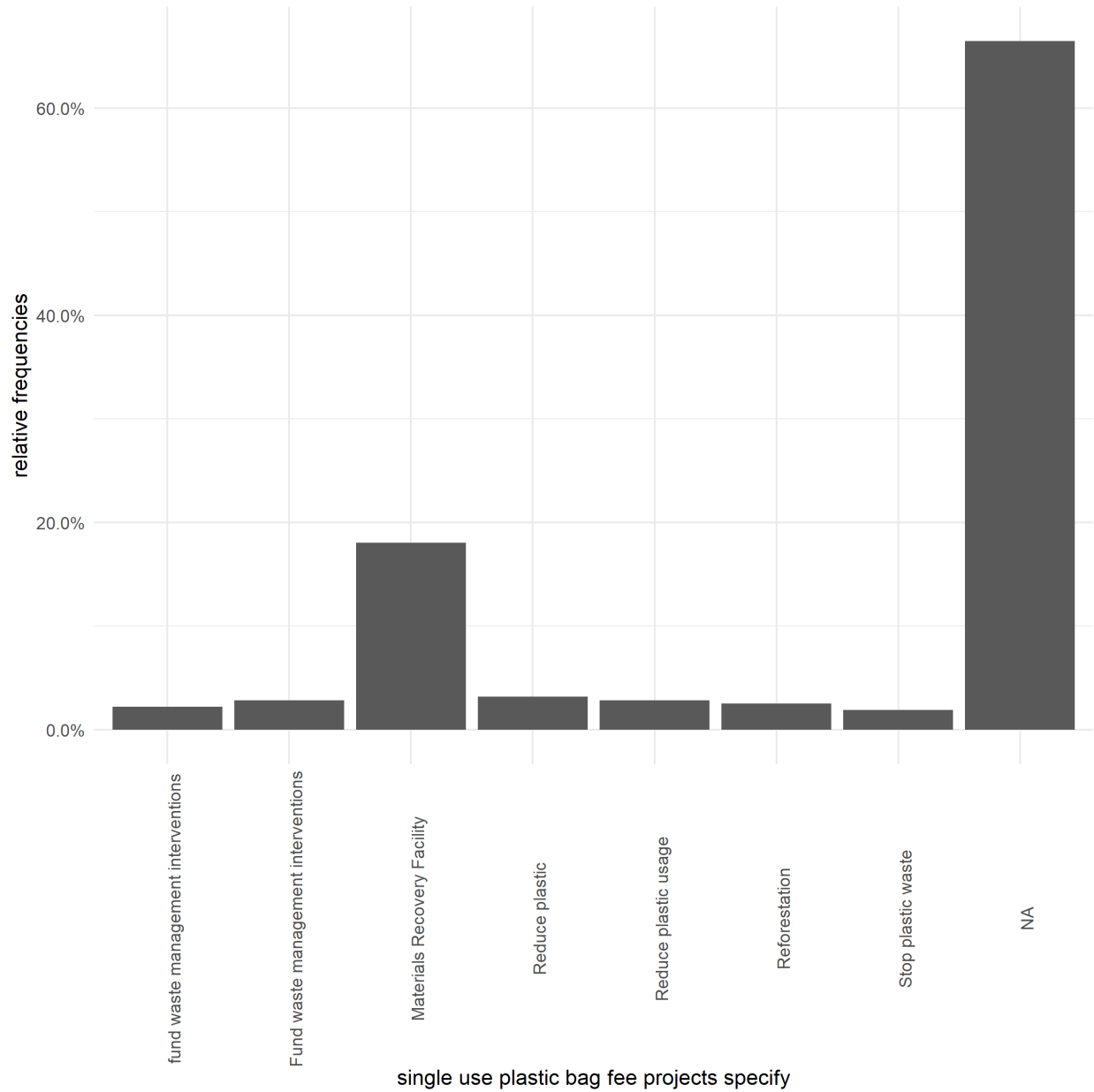
The environment and litter continue to be the main driver for both willingness to pay for single use bags and willingness to bring a multi use bag.



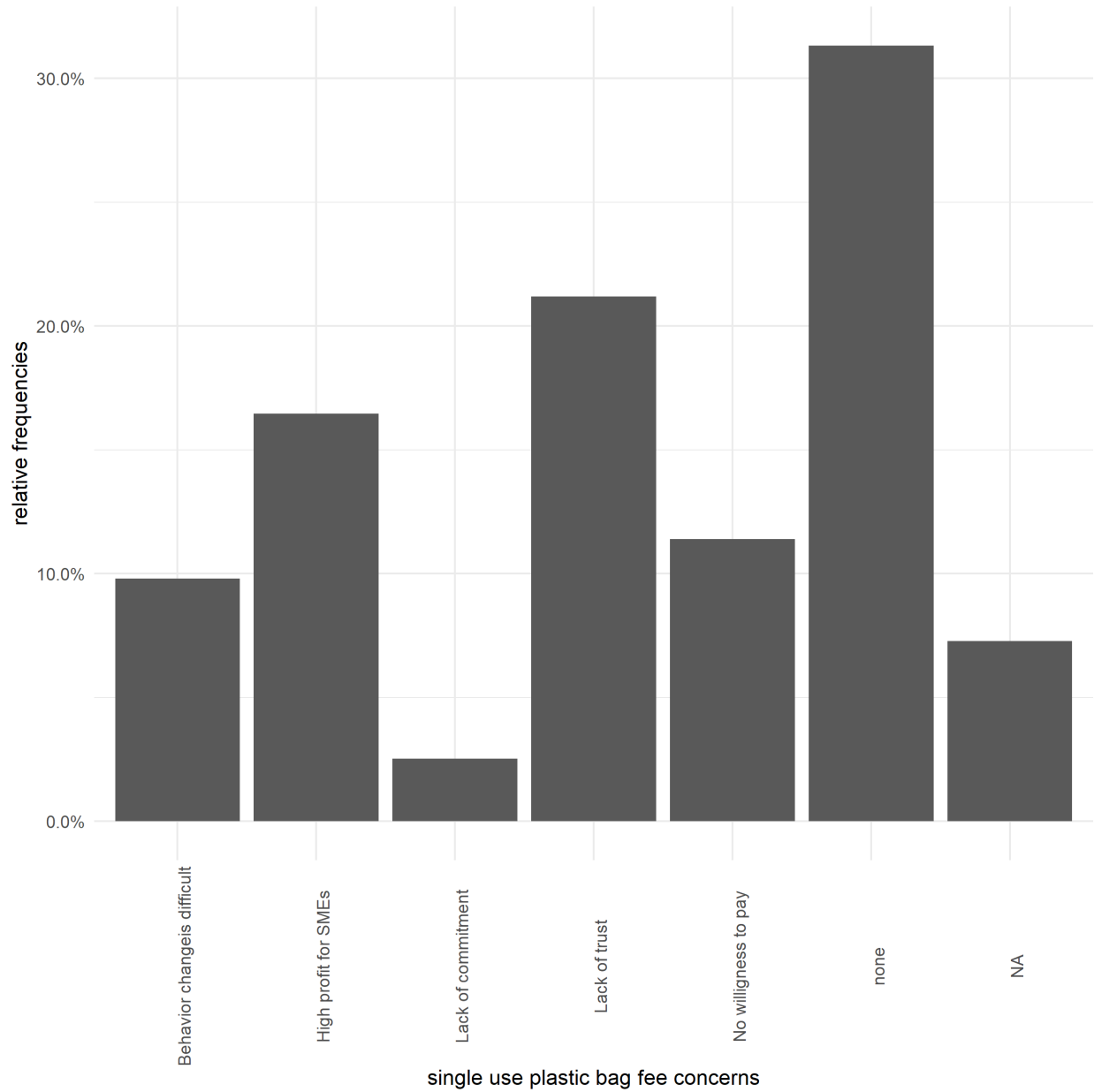
Given we are able to collect some of the revenue from taxation on single use bags at the shop level, in this check all that apply question, 37% of consumers would like to see this money used environmental projects and 31% would like to see this money used to reduce the price of goods at the shop.



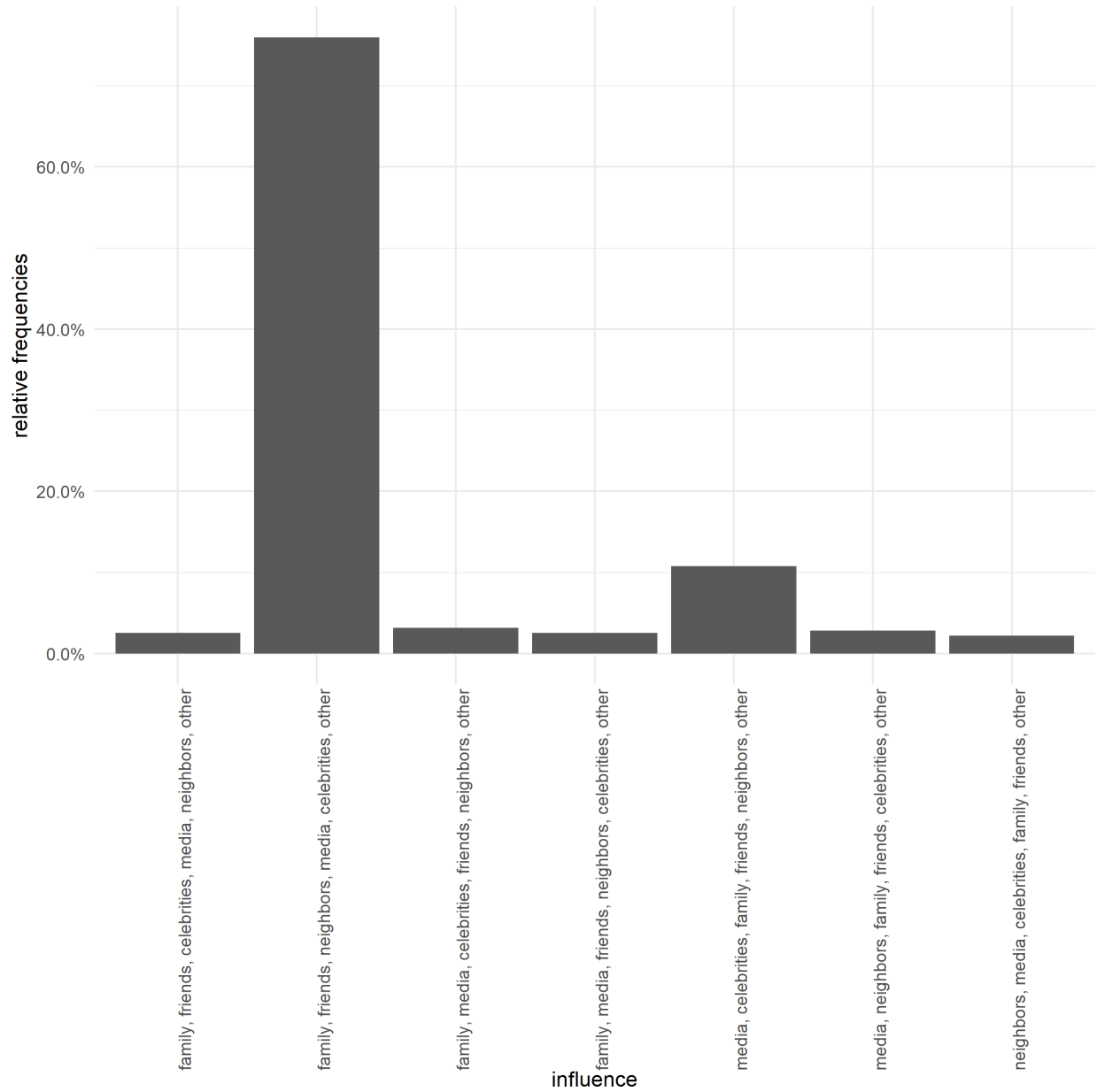
Most people reported that they do not have a specific project in mind which implies that if revenue from single use bag fees was used for projects in the municipality it is best that the projects that the community can vote on would come from NGOs, CSOs, or other entities who best understand what the municipality could benefit from.



Almost 20% suggested funds from single use bag fees should go to an MRF but jbeil already has a relatively good MRF. The majority of respondents did not have a specific project in mind.

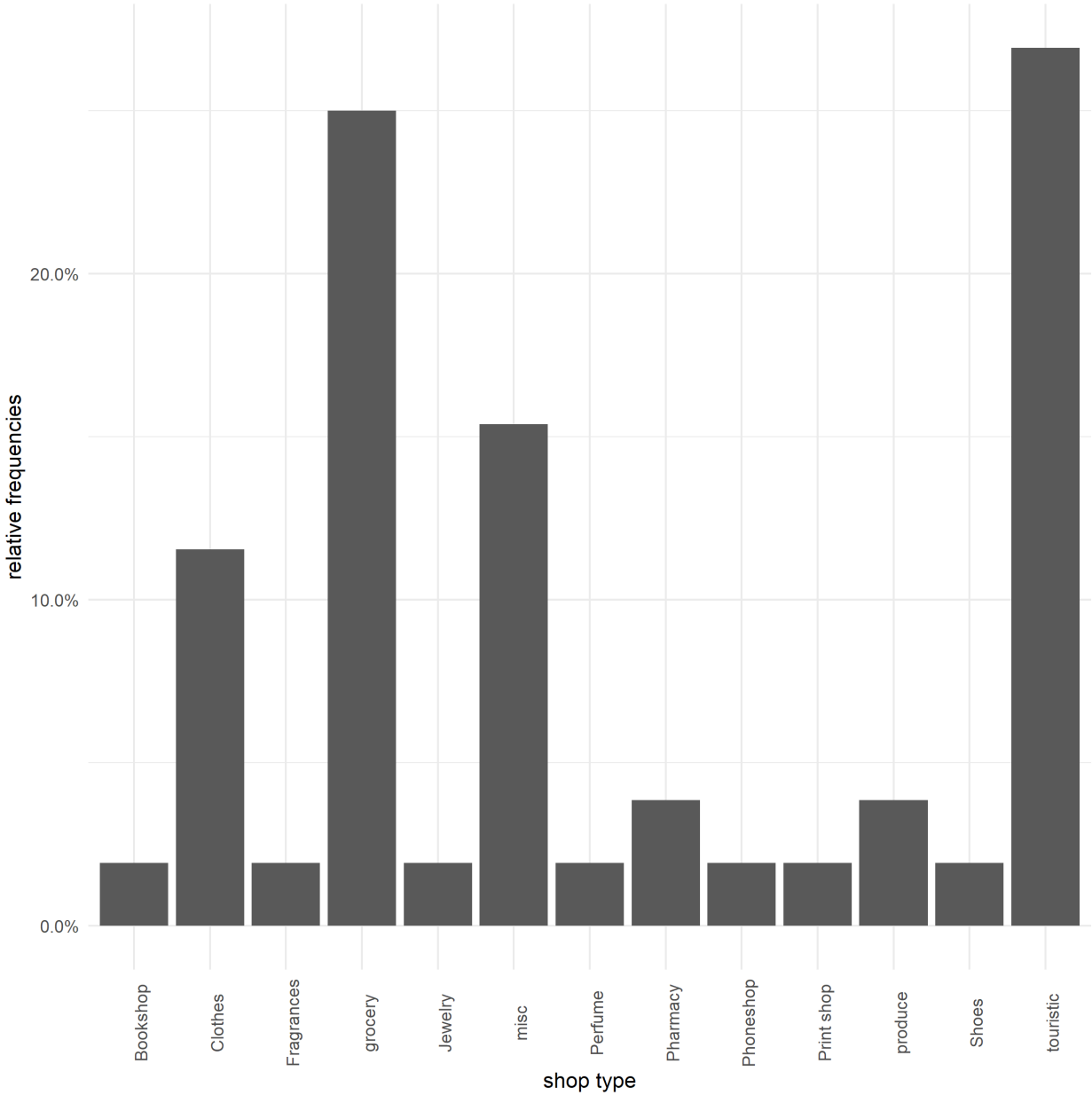


In this open ended fill in the blank question, 32% of consumers surveyed did not have any concerns with a fee on single use bags and 22% reported a lack of trust in the municipality or shops in running the tax

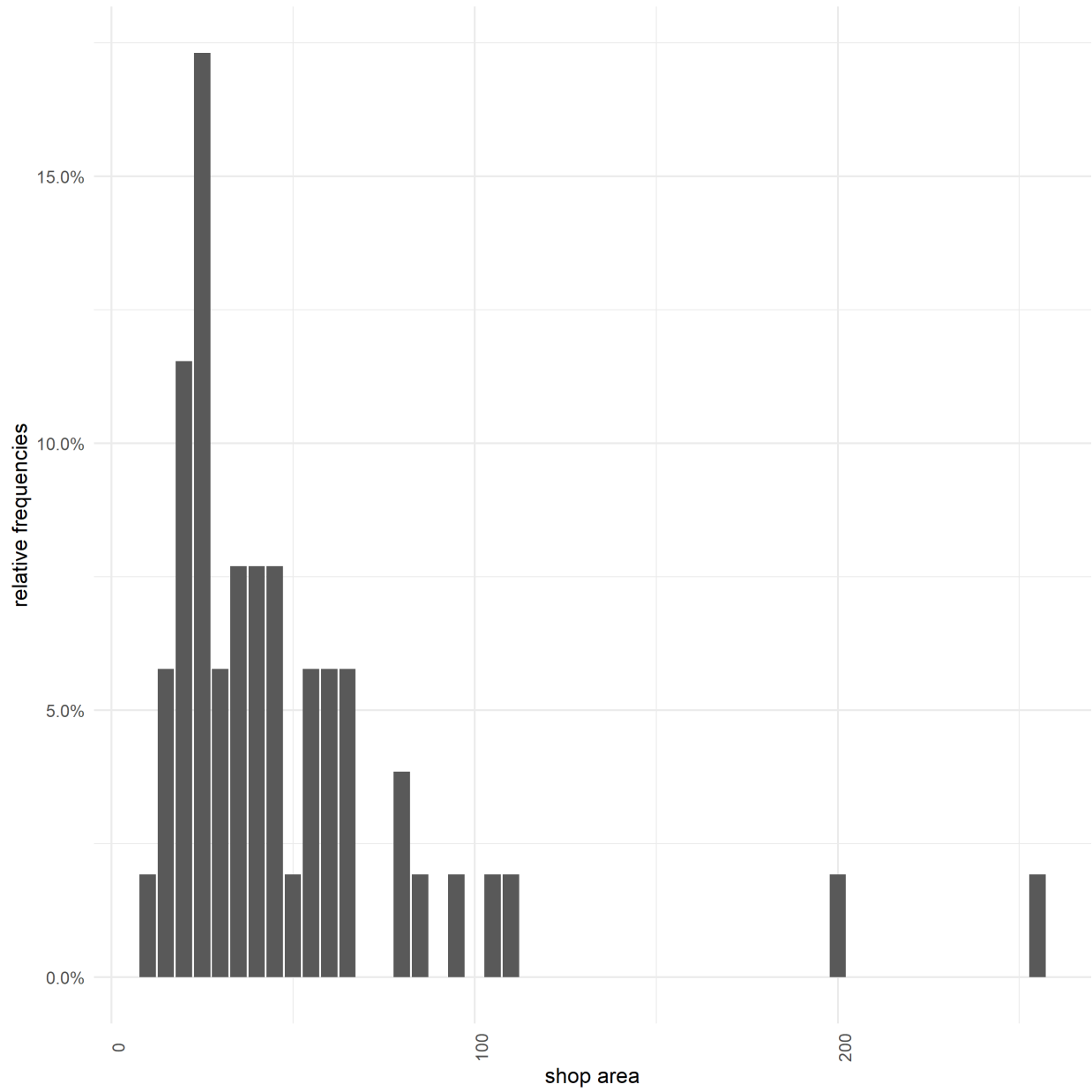


In this rank in the order of preference question, the overwhelming majority said family, friends, then neighbors influence their decisions the most. This is fundamental to the future of how campaigning around single use plastics should take shape.

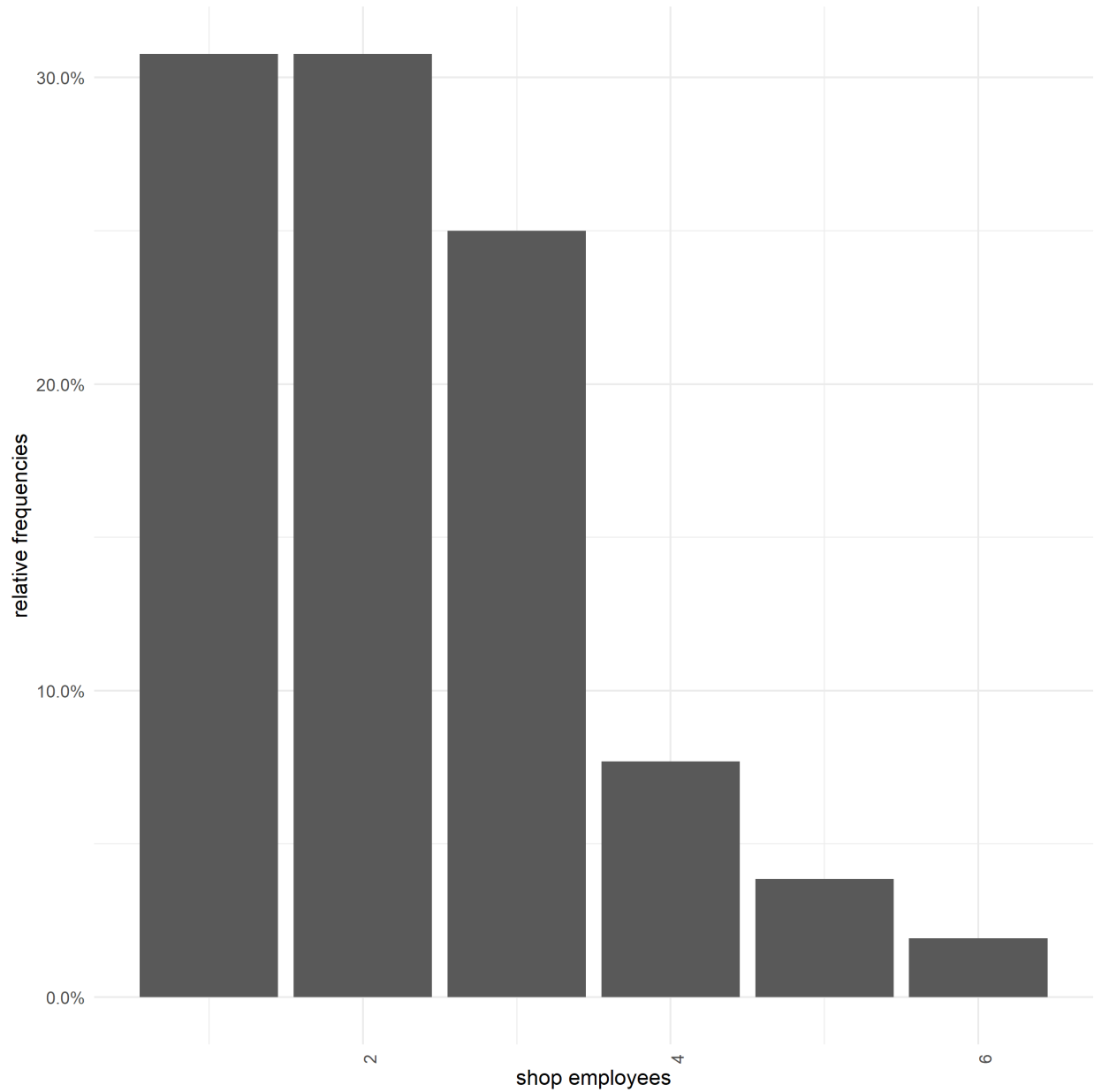
Graphs and findings of SME surveys



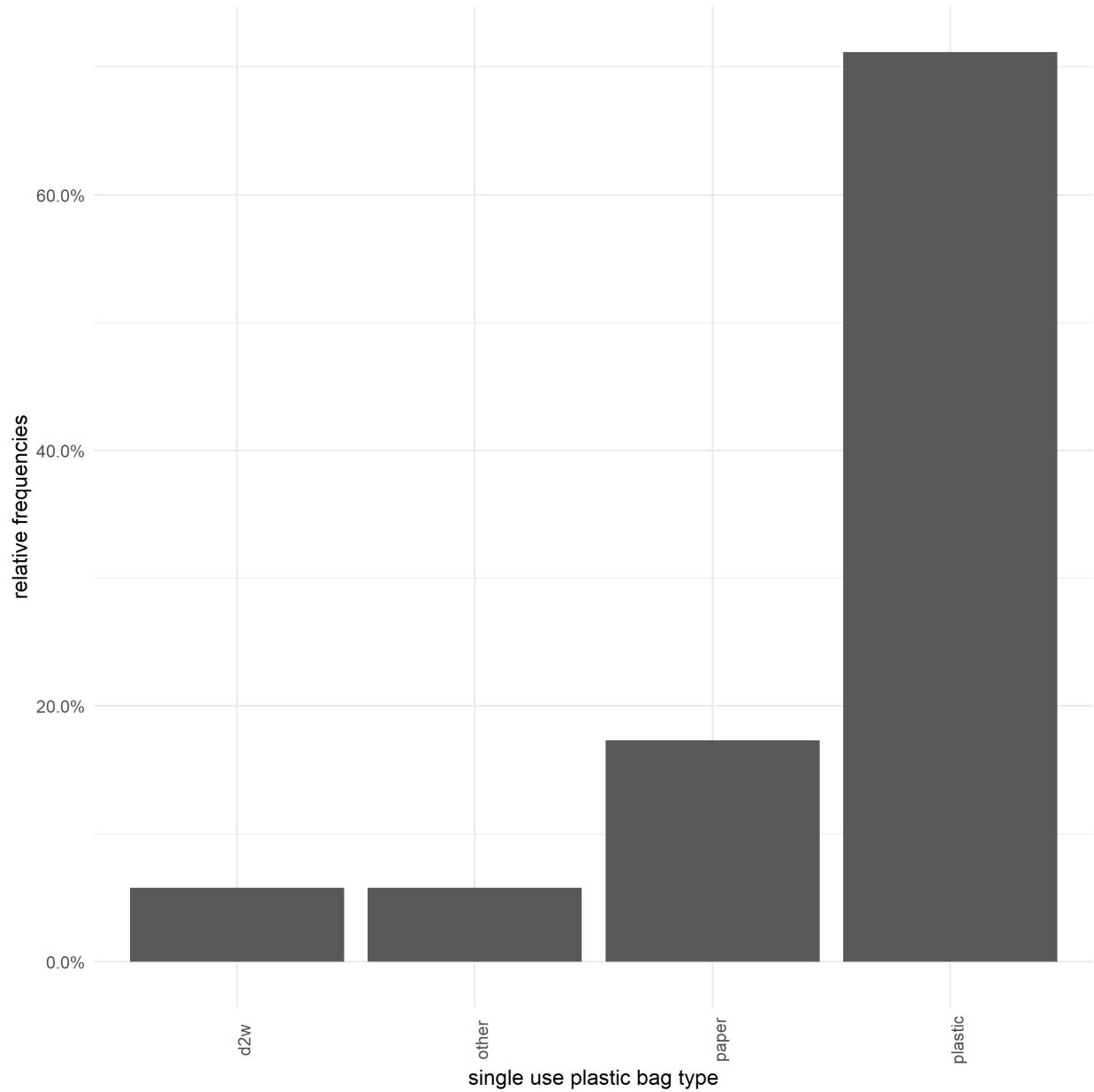
27% of the surveyed shops self identify as tourist shops in Jbeil which makes sense given the local economy is based on tourism and 25% of the shops surveyed are grocery shops which is about the expected percentage of grocery shops in the Municipality. It was useful to have a broad variety of shops in order to representatively understand the concerns of SMEs.



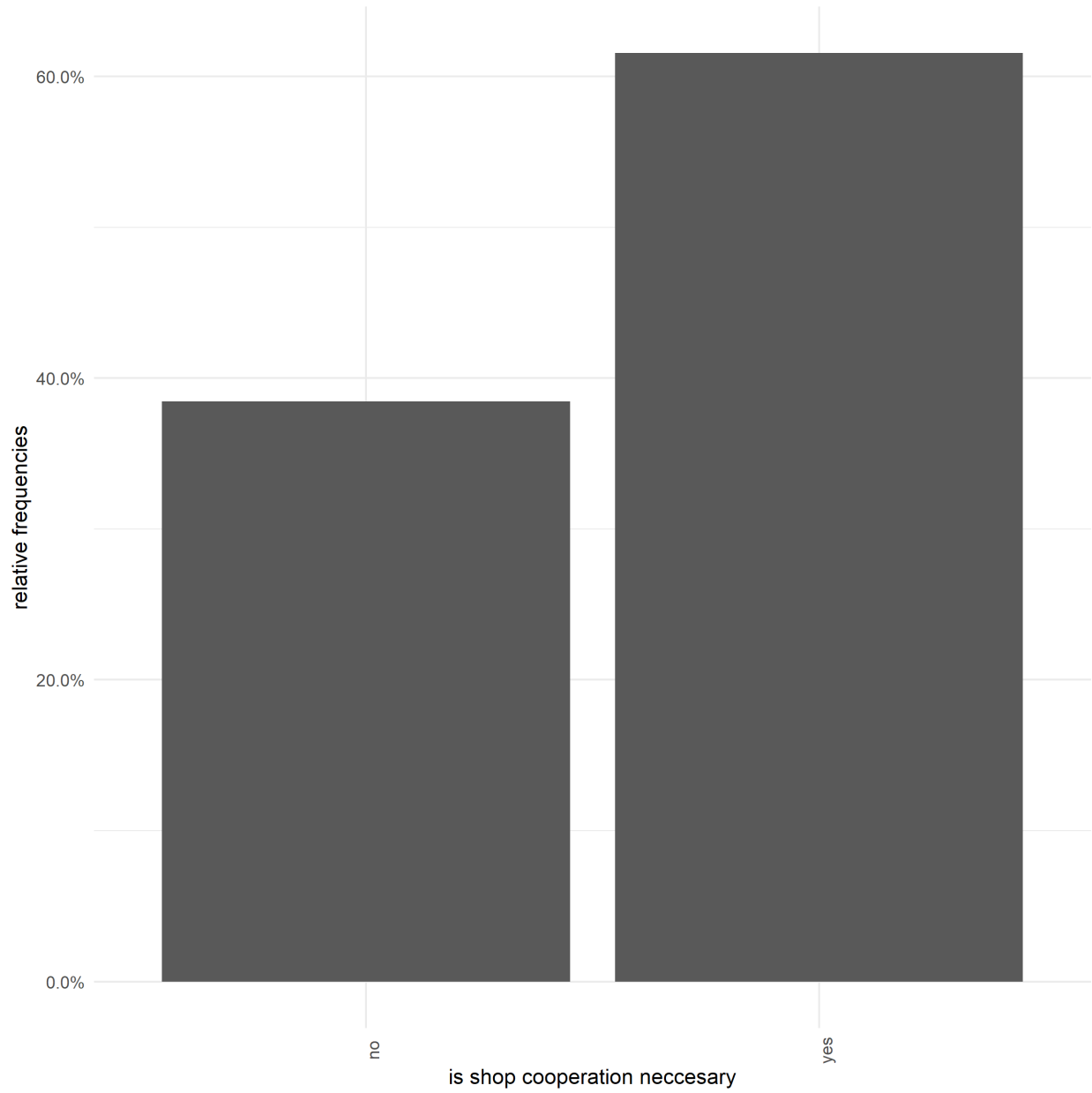
In this open ended question, the 84% of surveyed shops are between 20m² and 55m²



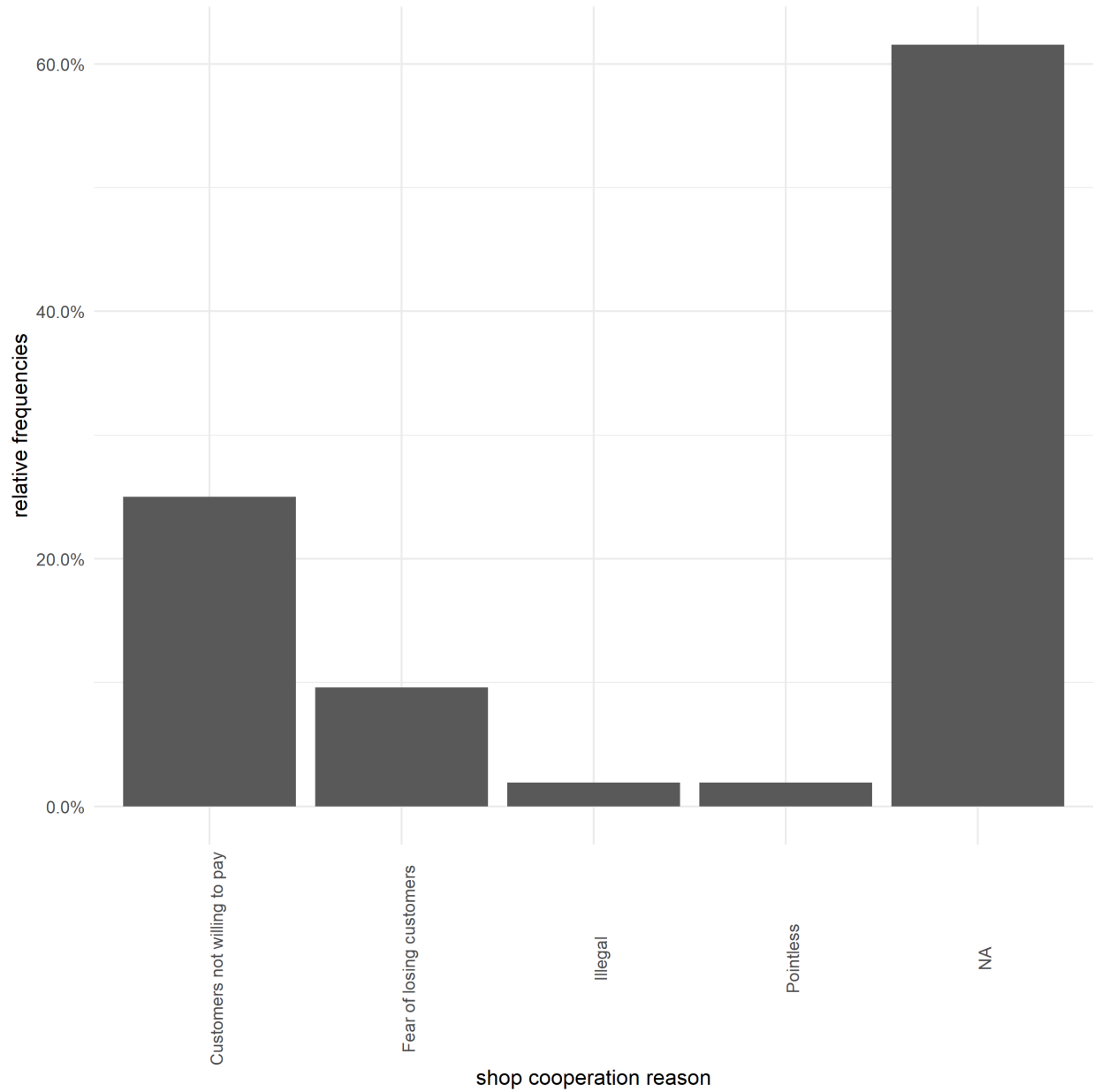
85% of shops have only 1-3 employees which means that shop area is more important indicator of shop activity than shop employees. These two figures are important for extrapolation of data to a larger number of shops.



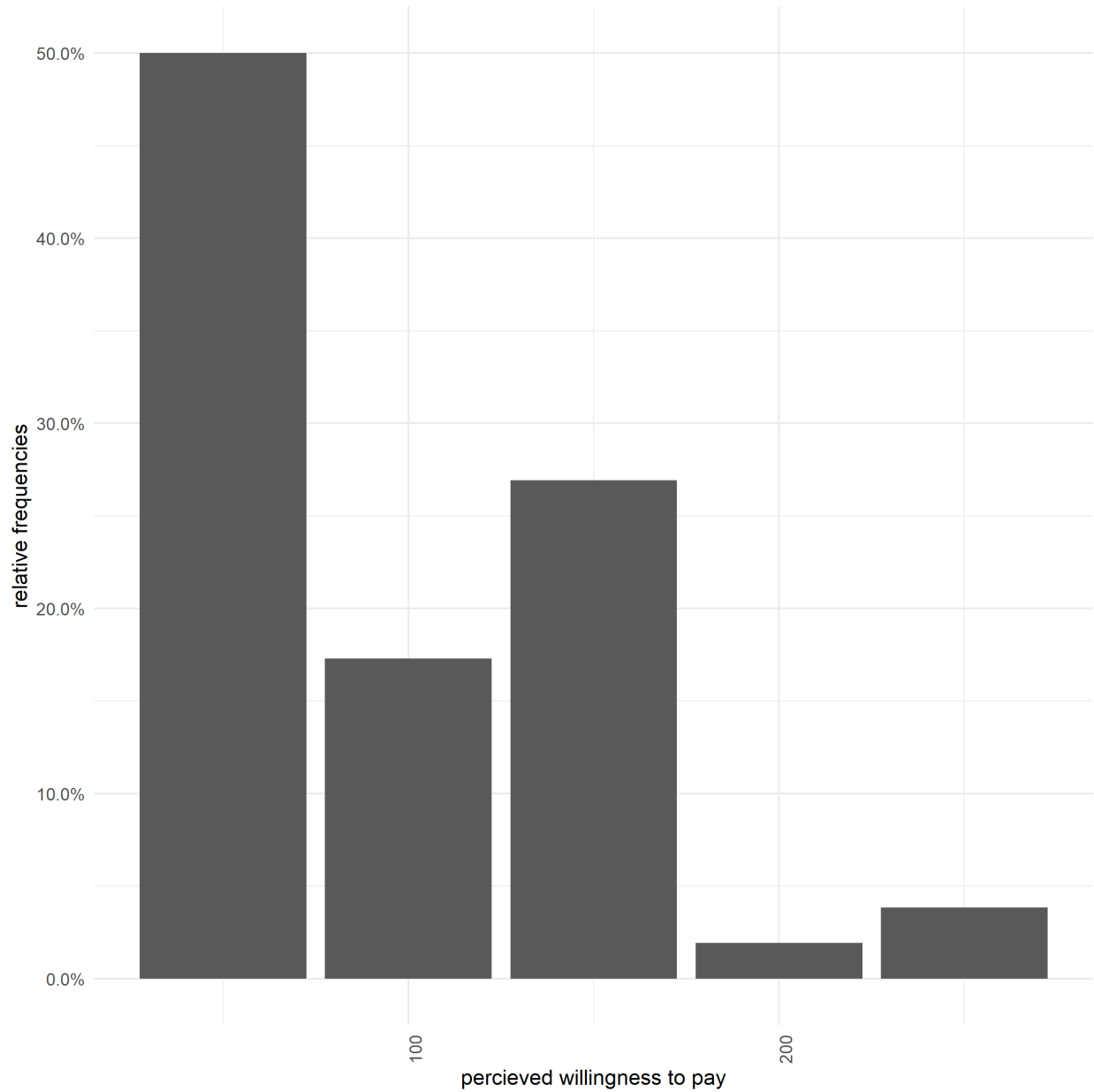
71% of shops are still using plastic bags despite the Mayor's mandate to ban plastic bags. This could be an issue in knowledge where some shops are reporting using plastic bags but may be using d2w which looks the same as the plastic bag. The greater number of shops using paper bags (18%) than d2w (7%).



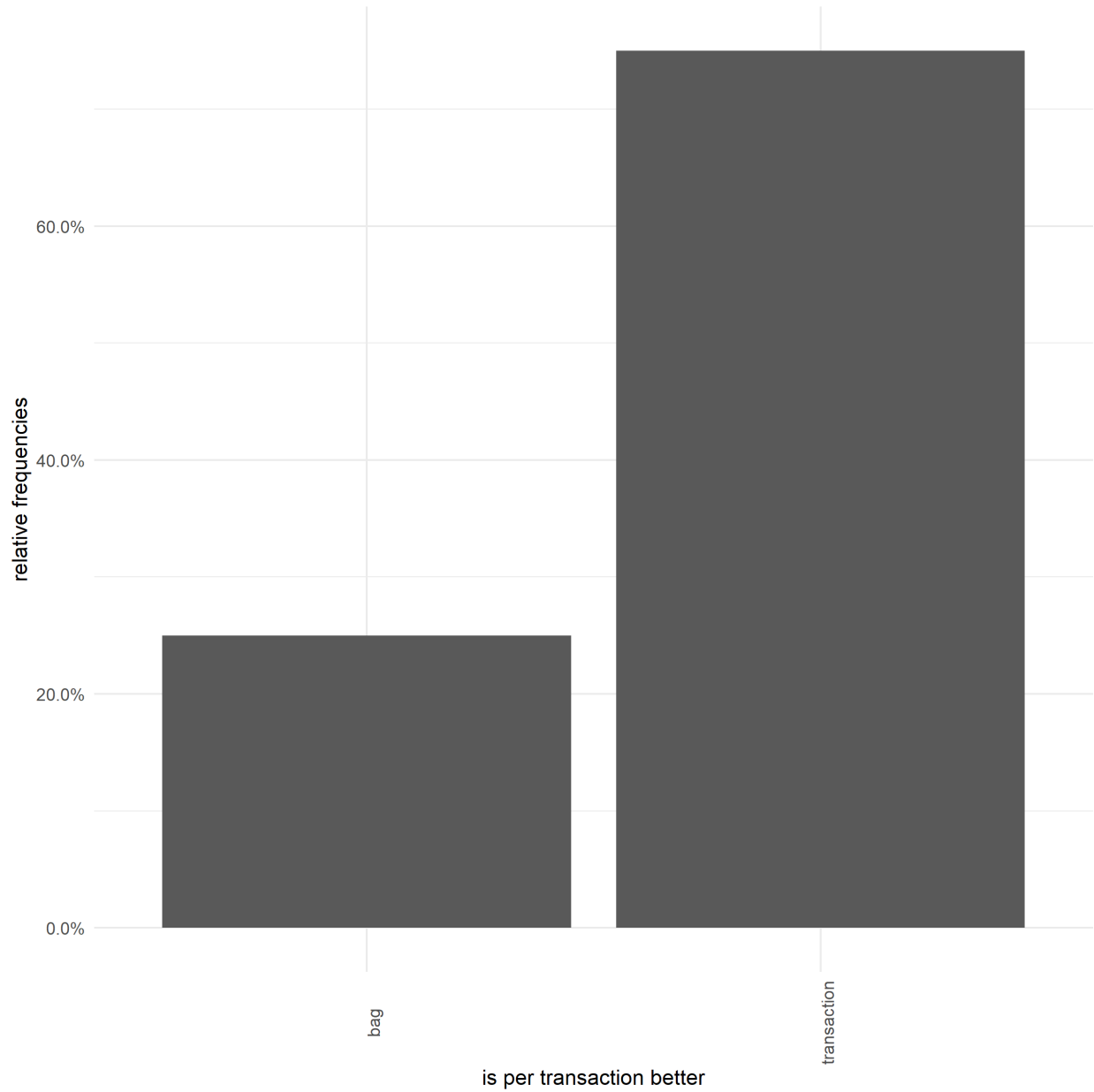
Over 60% of shops believe that it's a good idea for shops to be mandated to work together and not individually to place a fee on single use bags



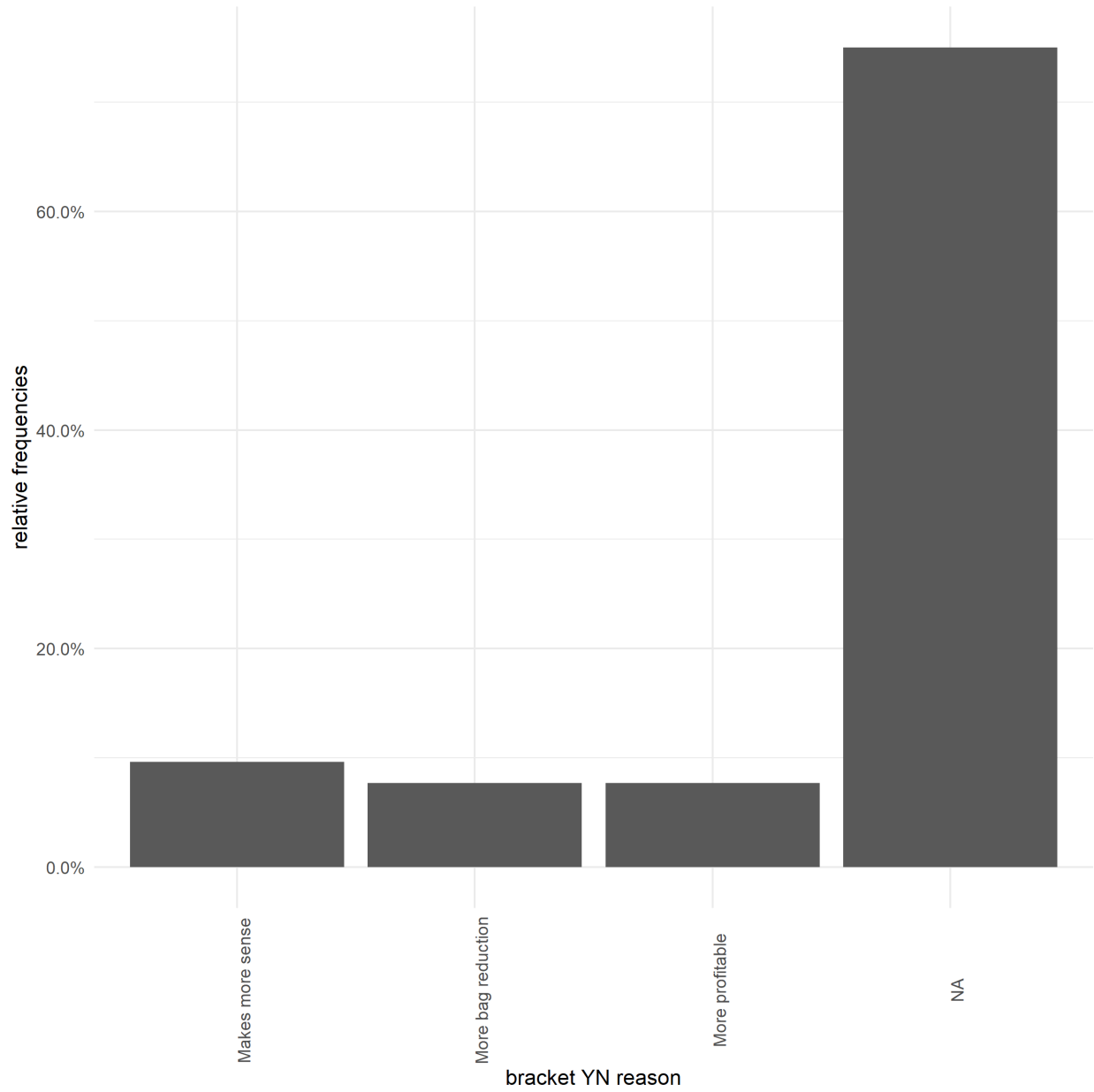
If the shop does not think it's a good idea to work together to charge consumers, then the largest reported issue at 25% is there concern of customers willingness to pay



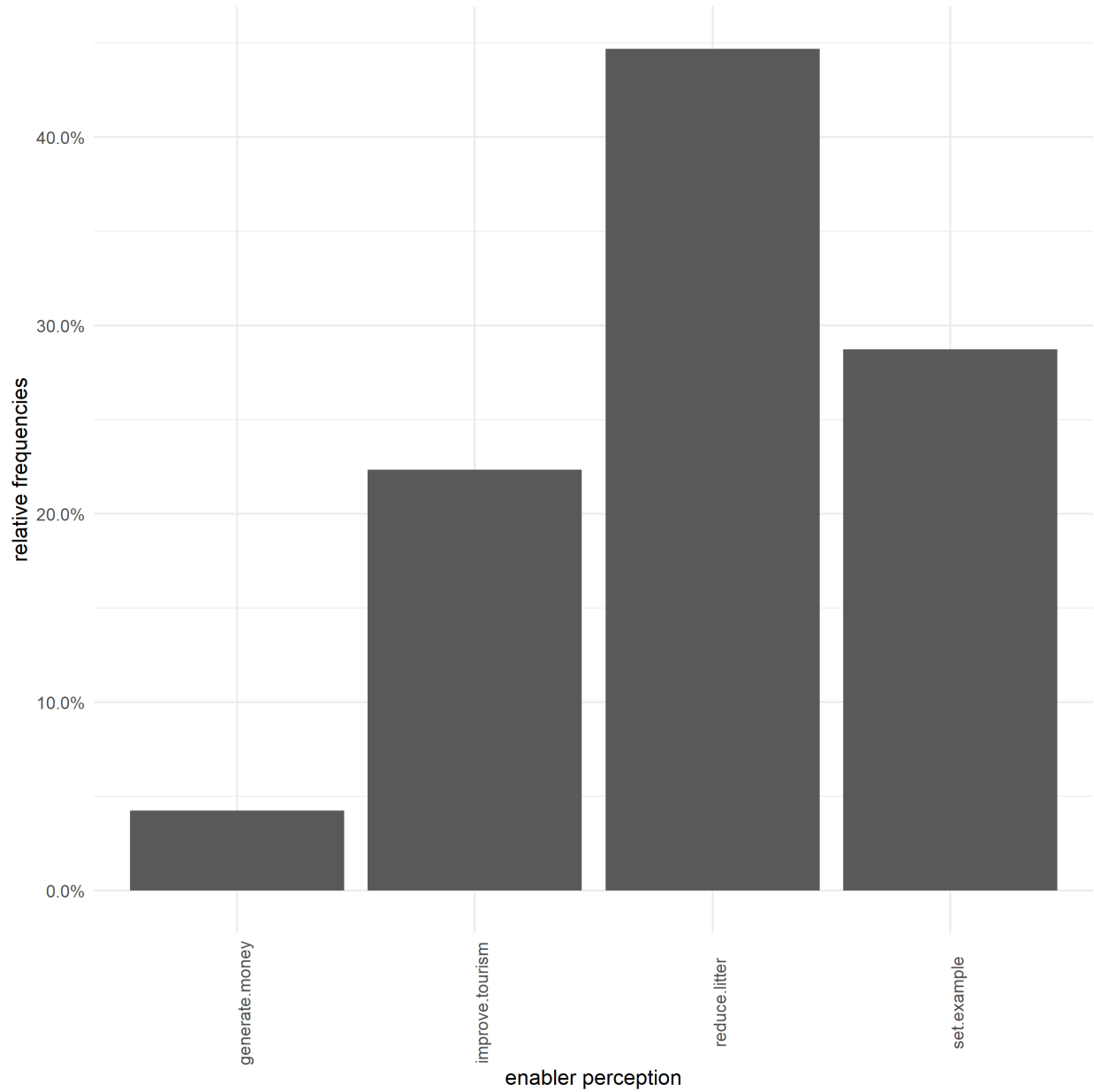
50% of shops choose the smallest possible fees for single use bags at 50LLB which may be a negligible cost for consumers and 25% choose 150LLB with less than 10% reporting that customers are willing to pay anything more.



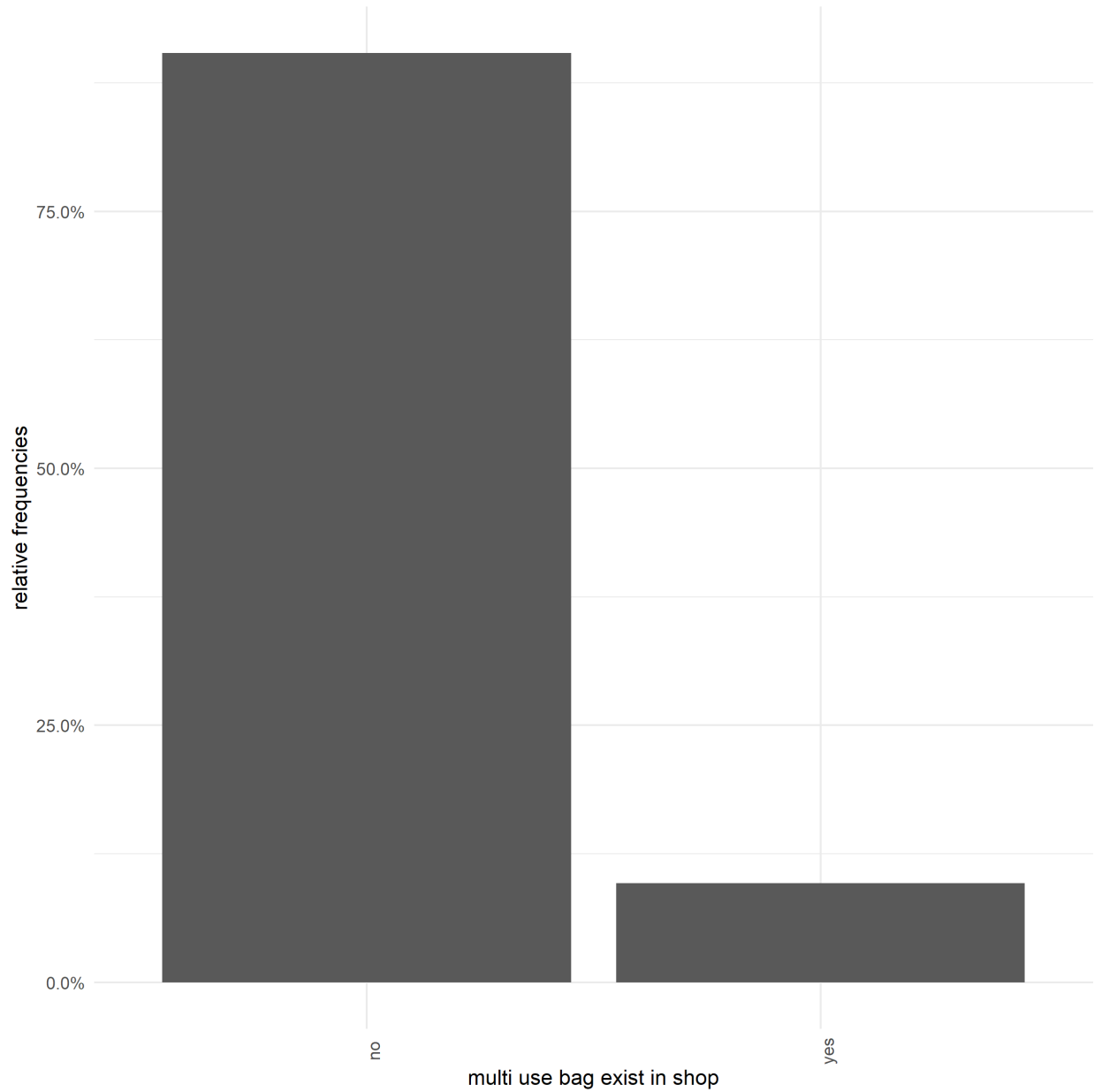
Over 70% of SME shops believe that a transaction based model for taxing single use bags is better. This is a very important finding because it is not aligned with the MoE's policy of per bag fee which only 23% of shops preferred. The transaction fee was theorized as better by UNCLOG given the ease of operating such a tax and how it is perceived as being able to soften consumer backlash.



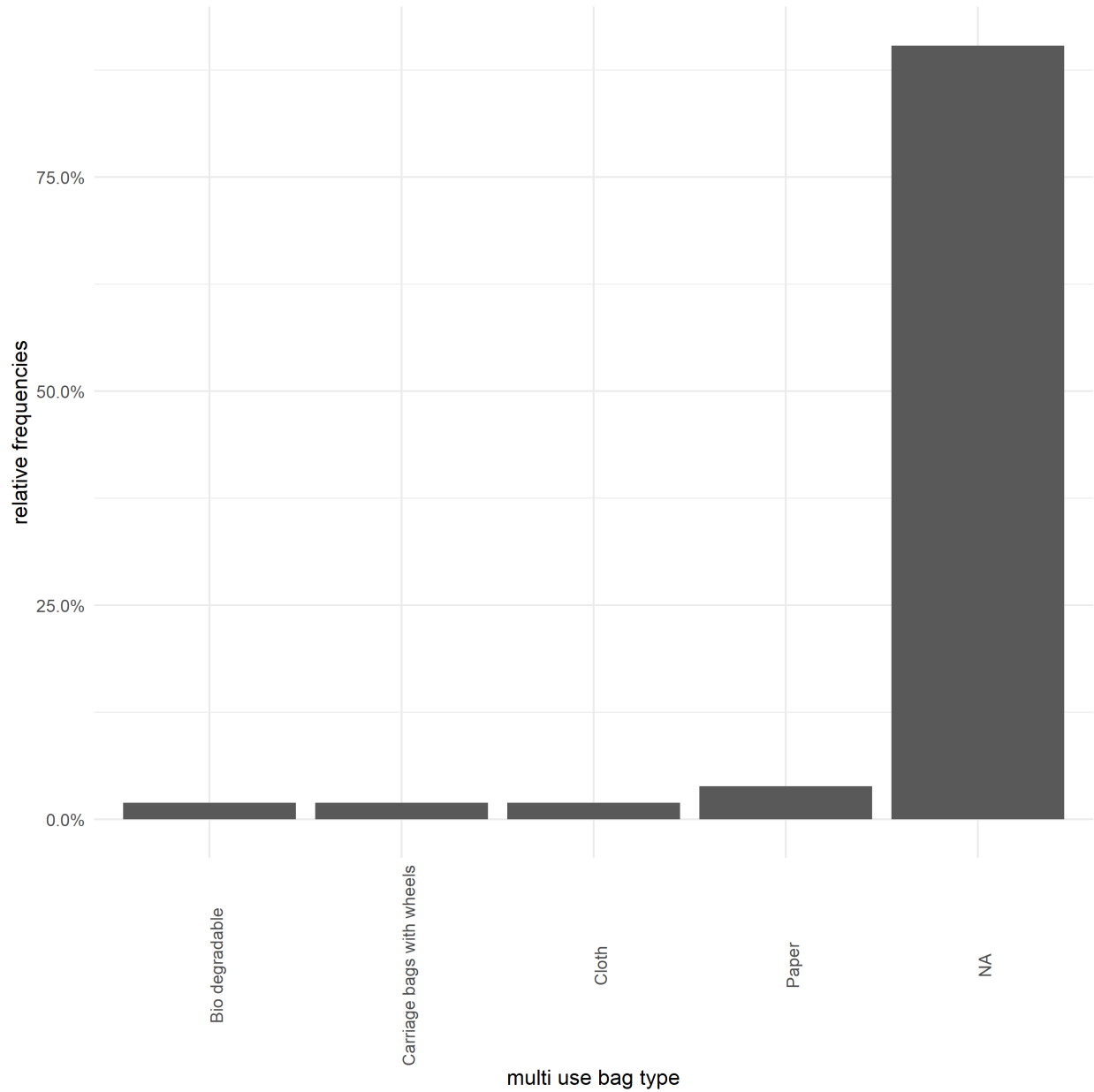
Of those who reported it's better to charge per bag 10% believed it simply made more sense



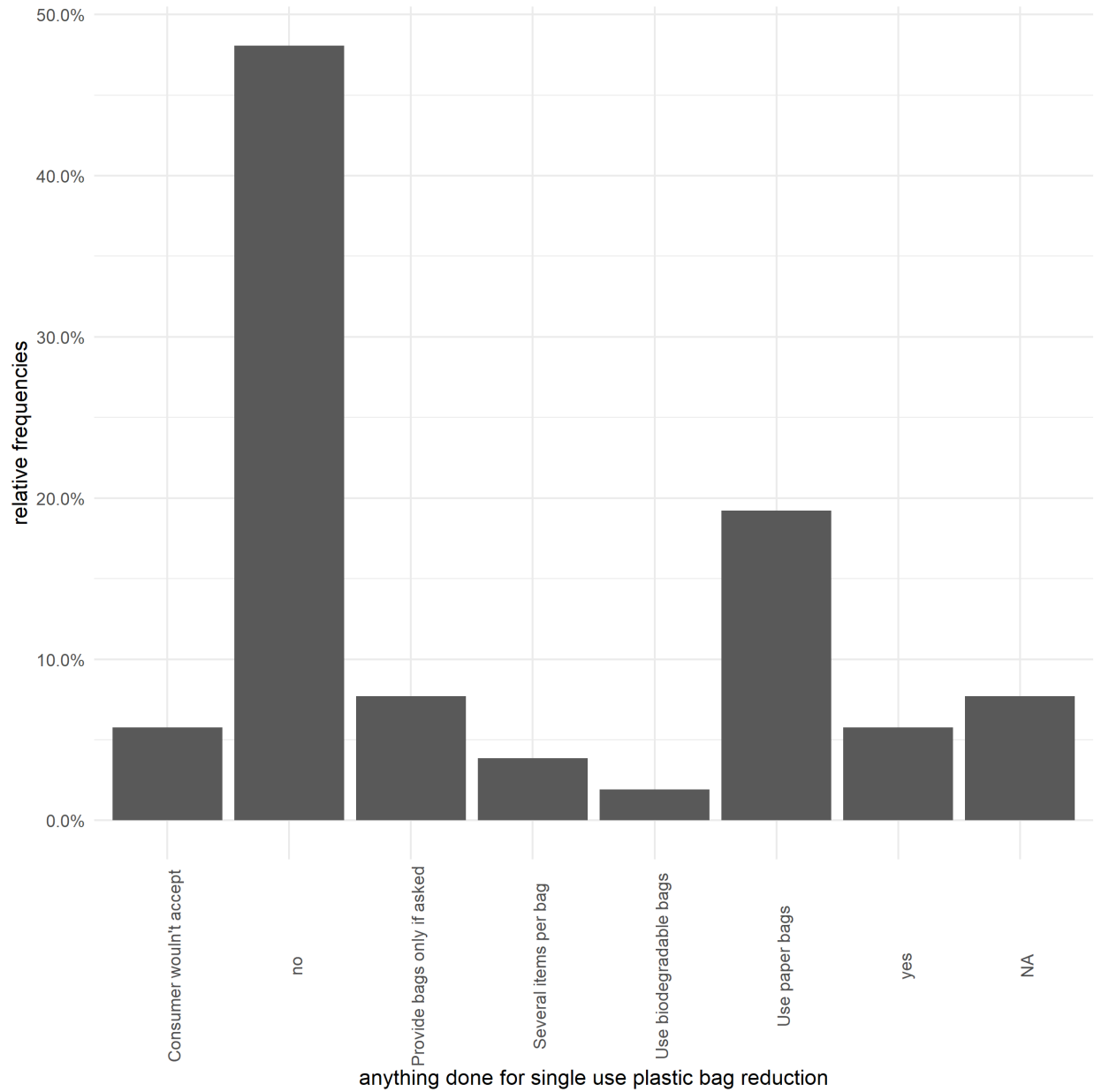
In this order of preference question almost 50% of the SMEs surveyed reported that they would feel more comfortable charging the fee if they know it would reduce litter and set an example for others.



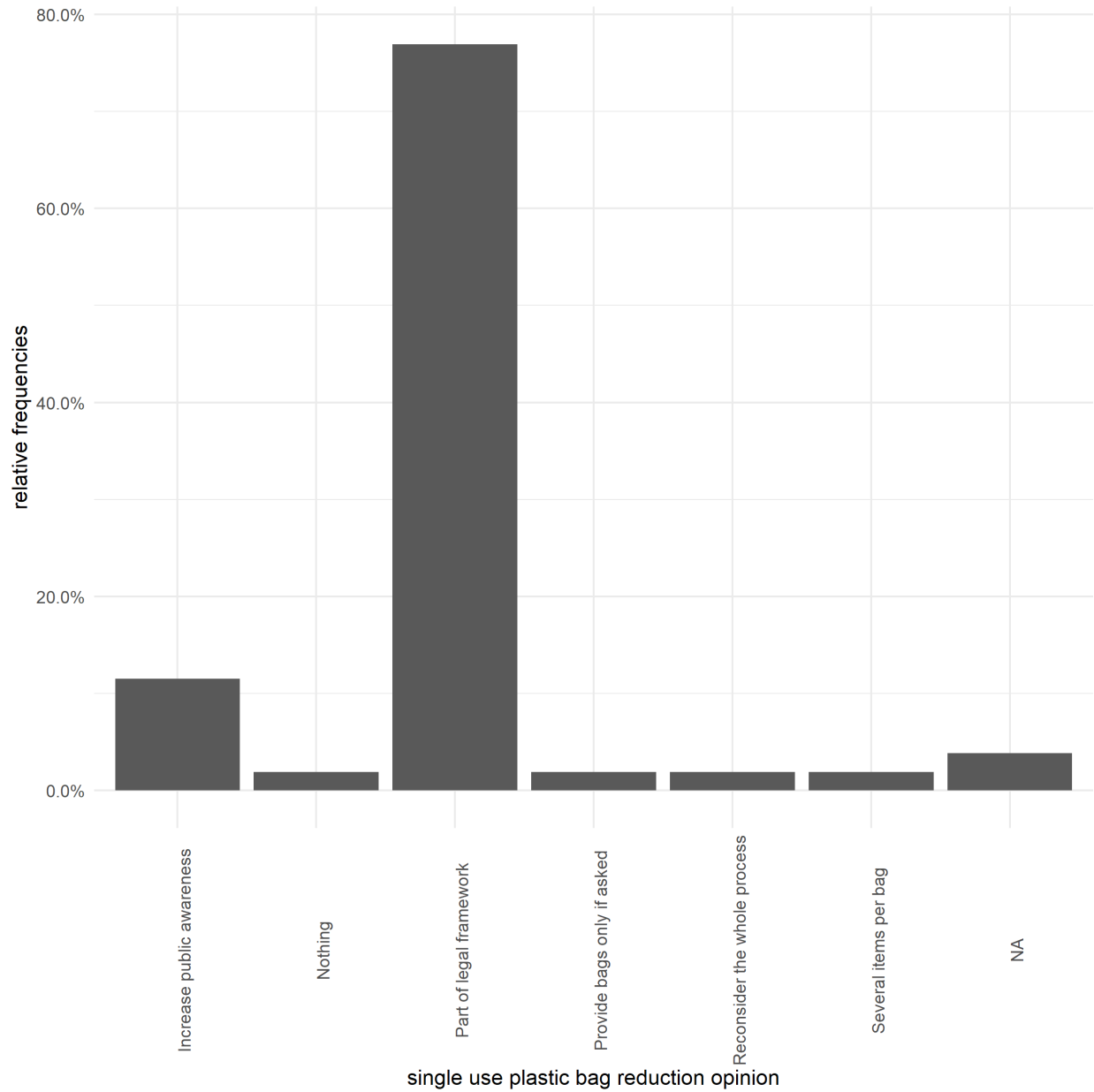
Over 85% of shops do not offer multi-use alternatives for consumers which could be also helping drive the low number of consumers using multi-use bags. This figure is actually higher since the answers given by shops that claim to be providing multi-use bags was paper and biodegradable (see below).



In this open ended question the small number of shops that are selling multi use bags are selling carriages and cloth bags (5%) and the remaining appear to be misinformed on what multi-use bags are seeing that they reported biodegradable and paper bags.



In this open ended question, 50% of shops are claiming they aren't doing anything to reduce the number of plastic bags being consumed in their shops and 18% reported using paper bags and it was interesting to see that 8% of shops are not giving bags unless the customer asks for them.



In this open ended question almost 80% of the shops surveyed believe that the best way to go about reducing single use bags is to rely on a legal framework with local or national policies and only 12% of the shops thought increasing public awareness is part of the solution.

Online repository for survey results

An online repository for storing and visualizing the results from 316 surveys with consumers and 52 SMEs in the Jbeil area has been created. This online repository was coded in the belief that data analysis should be democratized. Here is the link for the [online repository](#) showcasing the raw data and enabling visualization. At the top of the online repository web site under the Consumer Survey and SME Survey sections, there is a section titled raw data which shows the answers given to each of the survey entries across the columns as seen below.

Plotting Dashboard		Consumer survey		SME survey			
raw data		parameters explained					
Show		10		entries			
	HH.type	age	HH.size	shopping.preference	shopping.frequency	supb.harm	supb.harm_other
1	single	27	2	health	2_days	environment, health	
2	retired	68	3	chain	two_weeks	health, environment	
3	familyWOchildren	55	4	chain	2_days	environment, cleanliness, health	

Plotting Dashboard Consumer survey SME survey

raw data parameters explained

Show 10 entries

	shop.type	shop.area	shop.employees	subp.type	subp.type_other	subp.size	subp.size_other	subp.weight.small	subp.weight.medium	subp.weight.large	subp.weight.other	subp.
1	produce	55	2	plastic		small, medium, large		50	50	50		
2	grocery	60	1	plastic		small, medium		3	2			
3	misc	65	1	plastic		small, medium, large		3	3	2		
4	touristic	25	1	d2w		medium			60			
5	Clothes	55	2	paper		small, large		15		20		
6	Jewelry	20	3	paper		small		50				
7	touristic	25	2	plastic		medium, large			10	10		
8	misc	25	1	plastic		large				5		
9	grocery	45	3	plastic		small, medium, large		5	10	10		
10	Clothes	200	2	plastic		large				7		

As mentioned prior, in order to enable visualization of the data we used unique naming conventions for the survey questions and coded the answers in a way that facilitates data analysis. The reference for the naming conventions and coding can be found in the parameters explained section for both SMEs and consumer surveys as seen below.

Plotting Dashboard Consumer survey SME survey

raw data parameters explained

Show 10 entries Search:

	DataName	English
1	HH.type	Which of the following best describes your household?
2	age	What is your age?
3	HH.size	How many people live in your household?
4	shopping.preference	Where do you do most of your grocery shopping?
5	shopping.frequency	How often do you shop for groceries?
6	subp.harm	By using single-use-plastic bags do you think you are harming any of the below?
7	biodegradable.perception	Do you think biodegradable bags are considerably better for health, the environment or your village?
8	biodegradable.perception.reason	Why you think biodegradable bags are considerably better for health, the environment or your village?
9	number.of.bags	How many bag(s) did you USE during this visit?
10	subp.use.frequency	When you go shopping, how often do you use rely use bags?

Showing 1 to 10 of 30 entries Previous 1 2 3 Next

Plotting Dashboard Consumer survey SME survey

raw data parameters explained

Show 10 entries Search:

	name	English
1	shop.type	Type of shop
2	shop.area	Surface area of the shop (square meters)
3	shop.employees	Number of employees at the shop
4	supb.type	What kind of single use bags do you rely on?
5	supb.size	What size of plastic bag do you use
6	supb.weight.small	Weight of small bags you use per month
7	supb.weight.medium	Weight of medium bags you use per month
8	supb.weight.large	Weight of large bags you use per month
9	supb.weight.other	Weight of other bags you use per month
10	supb.price.small	How much do you pay per KG of small bags?

Showing 1 to 10 of 29 entries Previous 1 2 3 N

Plotting dashboard

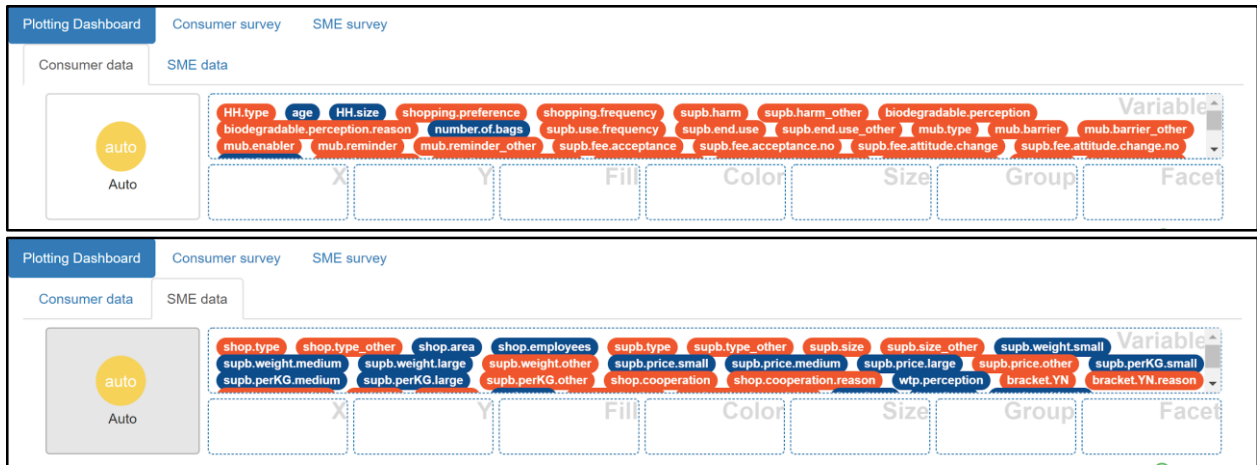
Importance

The plotting dashboard is a visualization tool for data that emerged from 316 surveys with consumers and 52 SMEs in the Jbeil area. We found that developing this tool to be very useful as we are an inherently visual world, where images speak louder than words. Data analysis and visualization can in itself be biased since the communicator of the data may choose to visualize and communicate certain variables and not others. However with this dashboard, data analysis is democratized so that any survey question and variable can be plotted and customized as seen fit by the user of the plotting dashboard. Furthermore, this addresses the need for a way to sort through, comprehend, and explain data in an accessible and quick manner. The results from qualitative and quantitative measurements of complex real- world situations are much easier to understand in a visual format as opposed to lines and lines of text and numbers.

Data visualizations make data easier for people to understand, and visualization also makes it easier to leverage our natural ability to detect patterns, trends, and outliers in groups of data, enabling the user to make more actionable conclusions.

Usage

Below is the basic plotting interface of the dashboard for the consumer survey and the SME survey respectively. Aside from the variables to plot on the **X** and **Y** axes, it contains the following elements: **Fill** (for histograms), **Color** (for lines), **Size** (for scatter) that allow representing additional aspects of the dataset on the X and Y variables, and **Facet** that partitions the plot into a matrix of panels where each panel shows a different subset of the data.

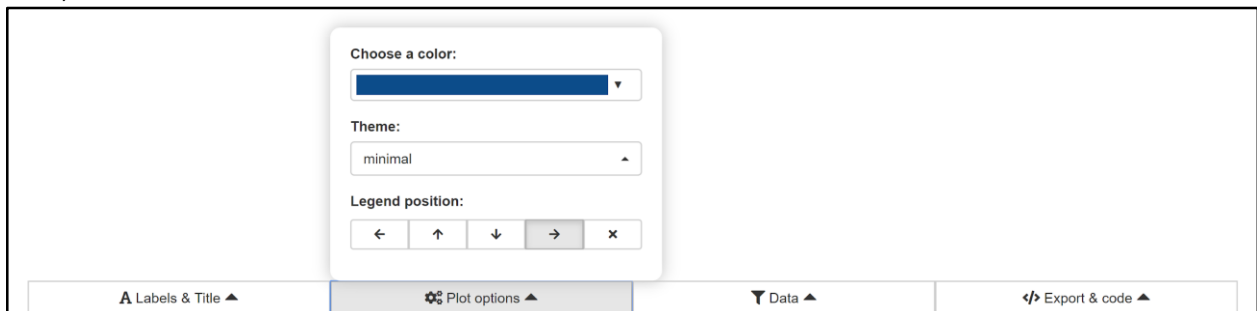


In the bottom part of the dashboard you'll find the below items:

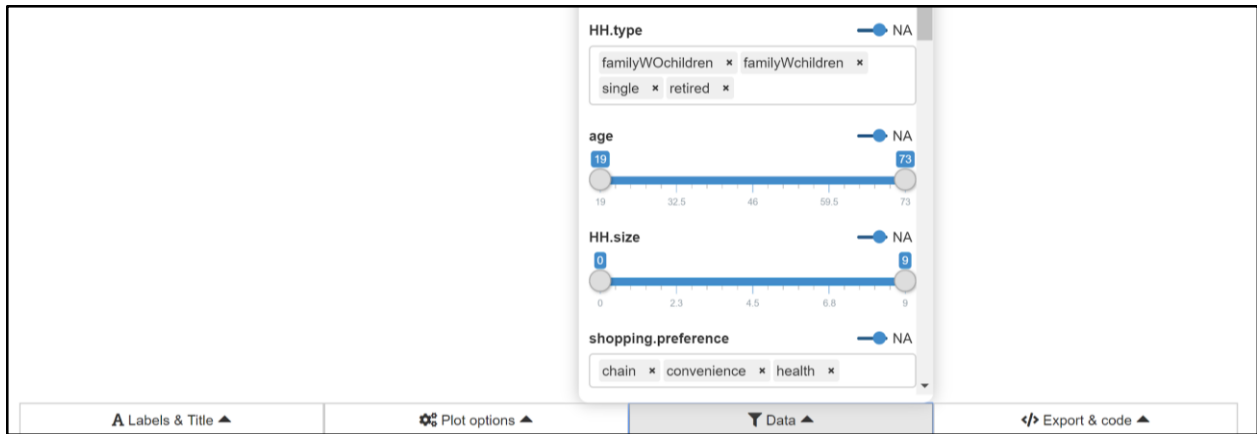
Labels and Titles that allows the modification of its elements from the values displayed by default



Plot options that allows the modification of plot-specific options (color schemes, axis positions, ..etc)



Data that allow to select specific subsets of the survey to explore



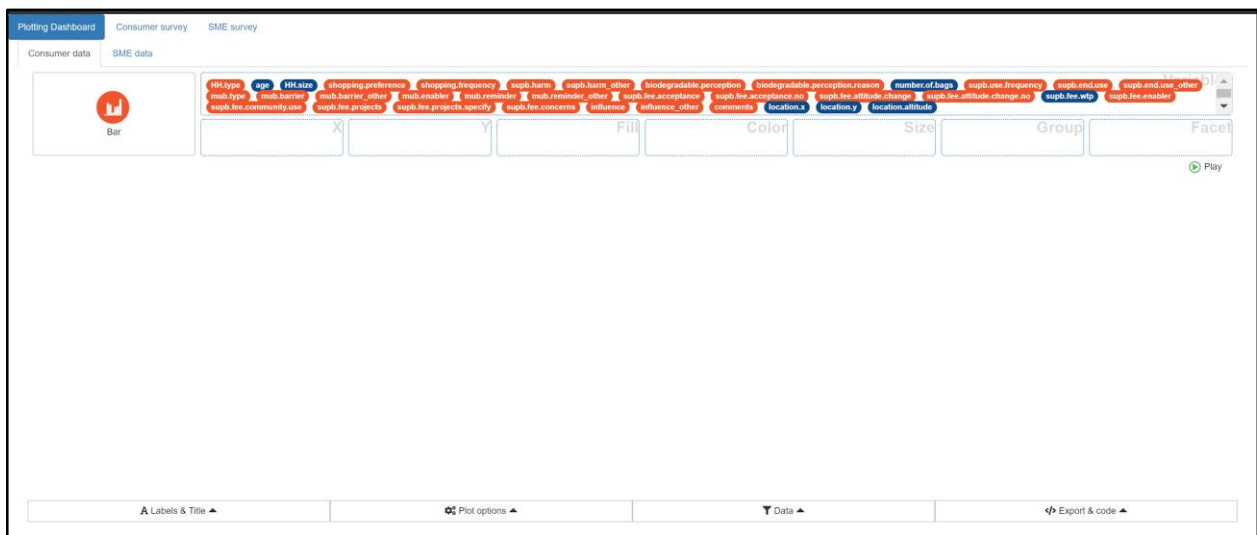
And **Export and Code** that is used to export the generated plots to standalone images if need be and also displays the backend code used to generate these plots (in ggplot format)



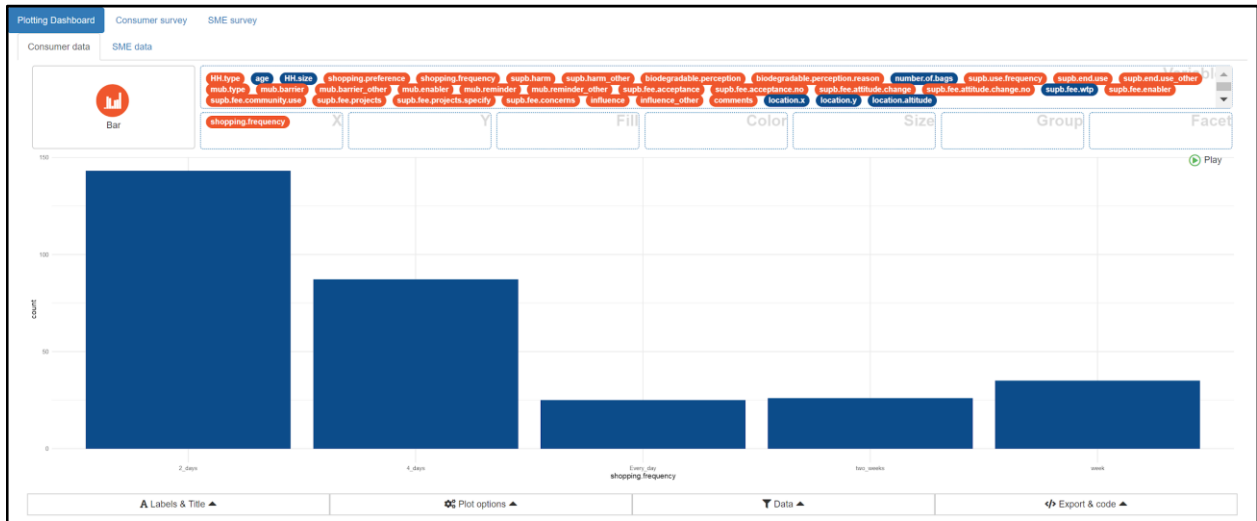
Example

The below sequence illustrated the usage of the dashboard.

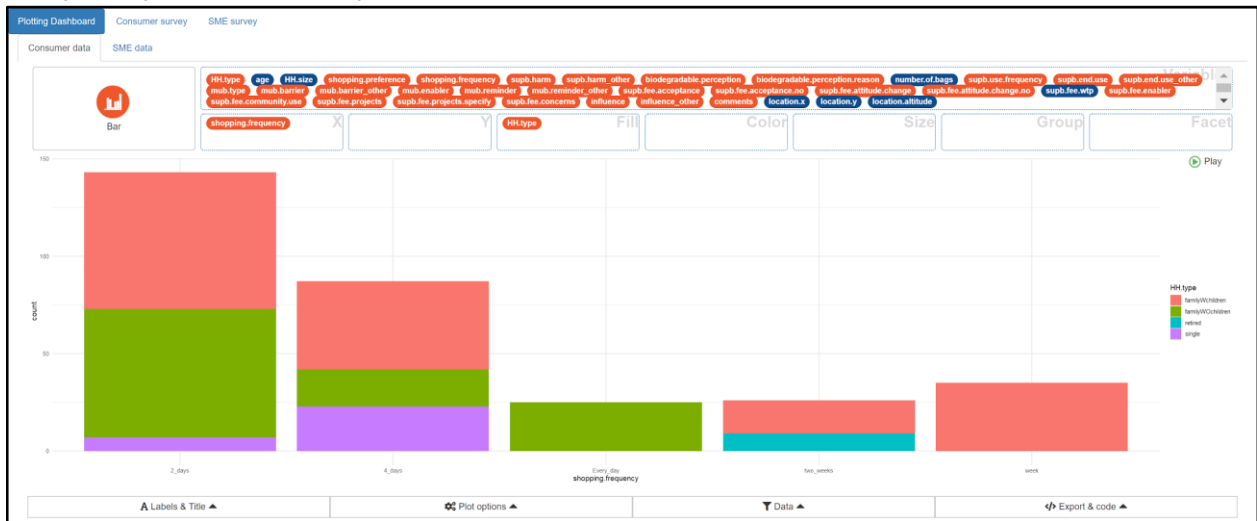
Starting with **Consumer data** we have the following blank dashboard



Dragging **shopping.frequency** to **X** we get the below illustration that shows that out of the total households surveyed, most of them do their shopping every two days and 4 days.



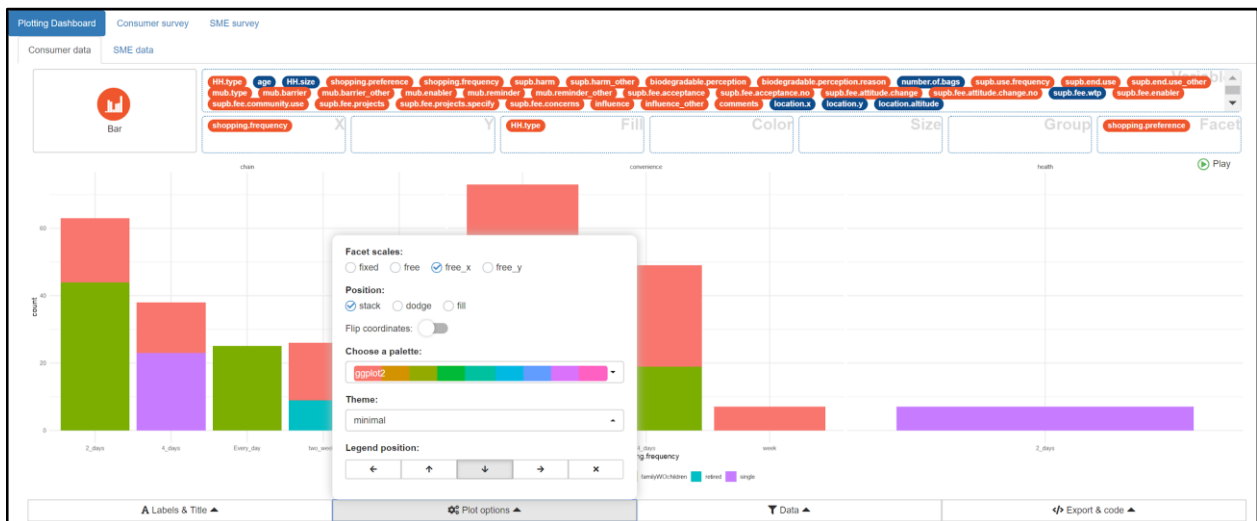
Assume we are interested in the shopping patterns of the households based on the household types. We drag **HH.type** to **Fill** to get the below illustration that for example only ‘families with children’ households do their shopping weekly ‘single’ households to their shopping at most every 4 days but never daily.

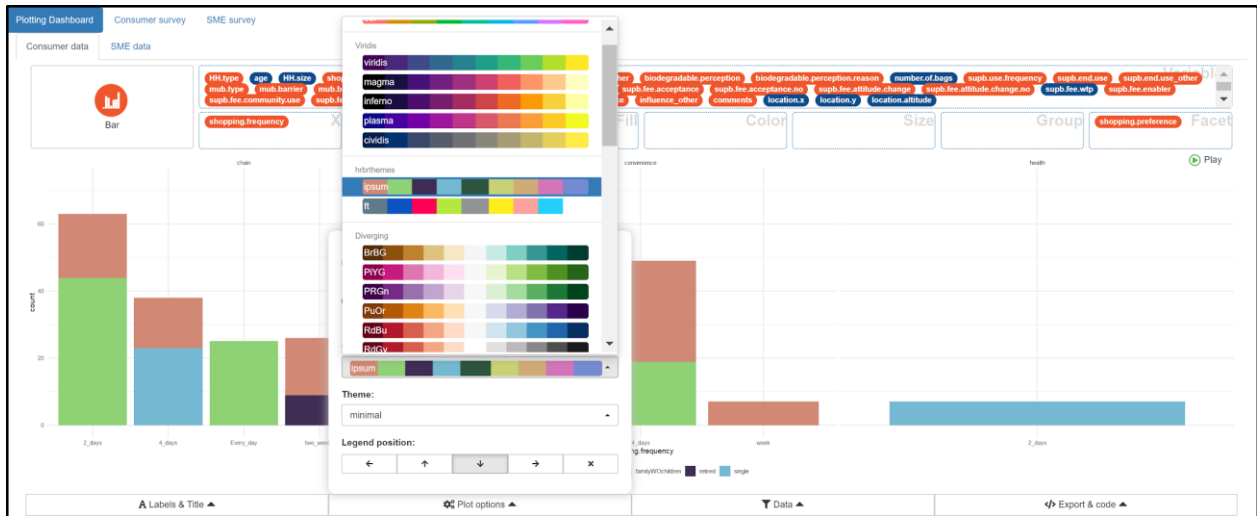


If we are further interested in the breakdown of those shopping patterns across shop types, we drag **shopping.preference** to **Facet** which gives the below illustration which shows, for example, that only ‘single’ households shop at ‘heath’ shops.

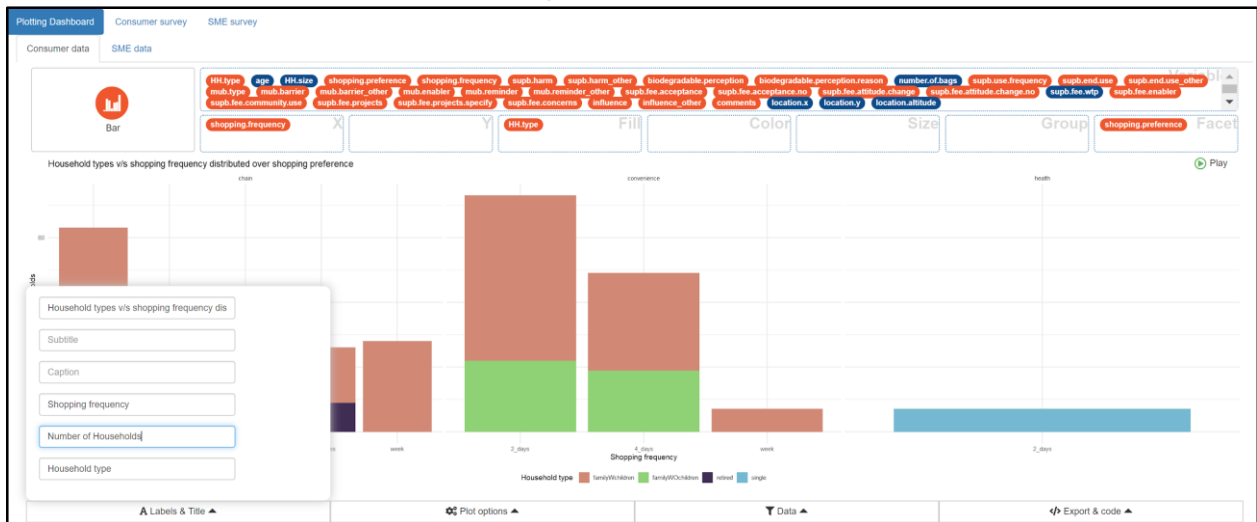


We can also make some aesthetic modifications using the **Plot options** tab by moving the **legend** to the bottom and changing the color **palette** as per the two screenshots below.

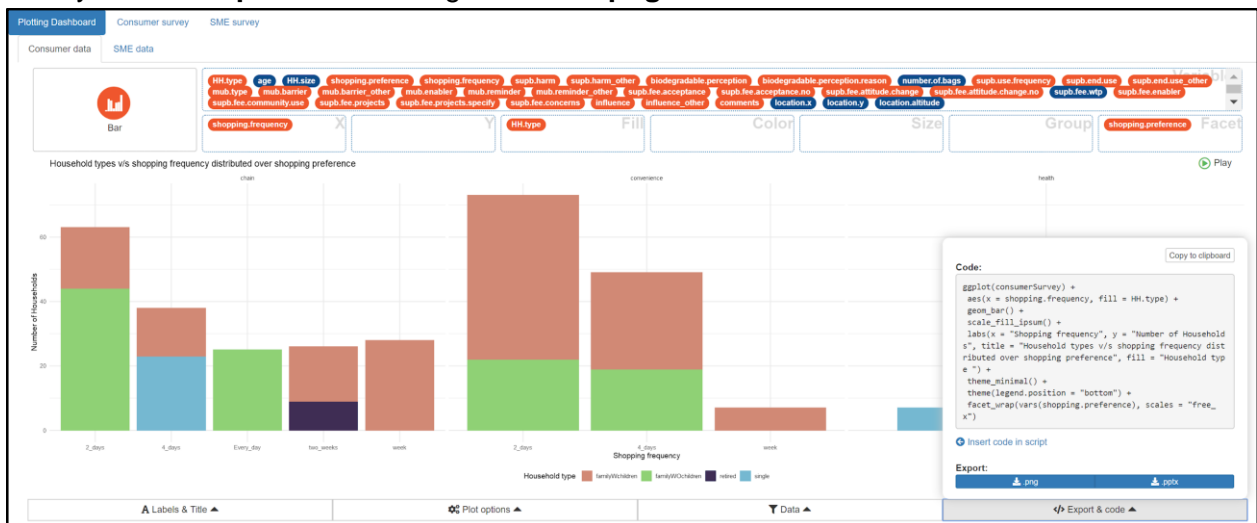




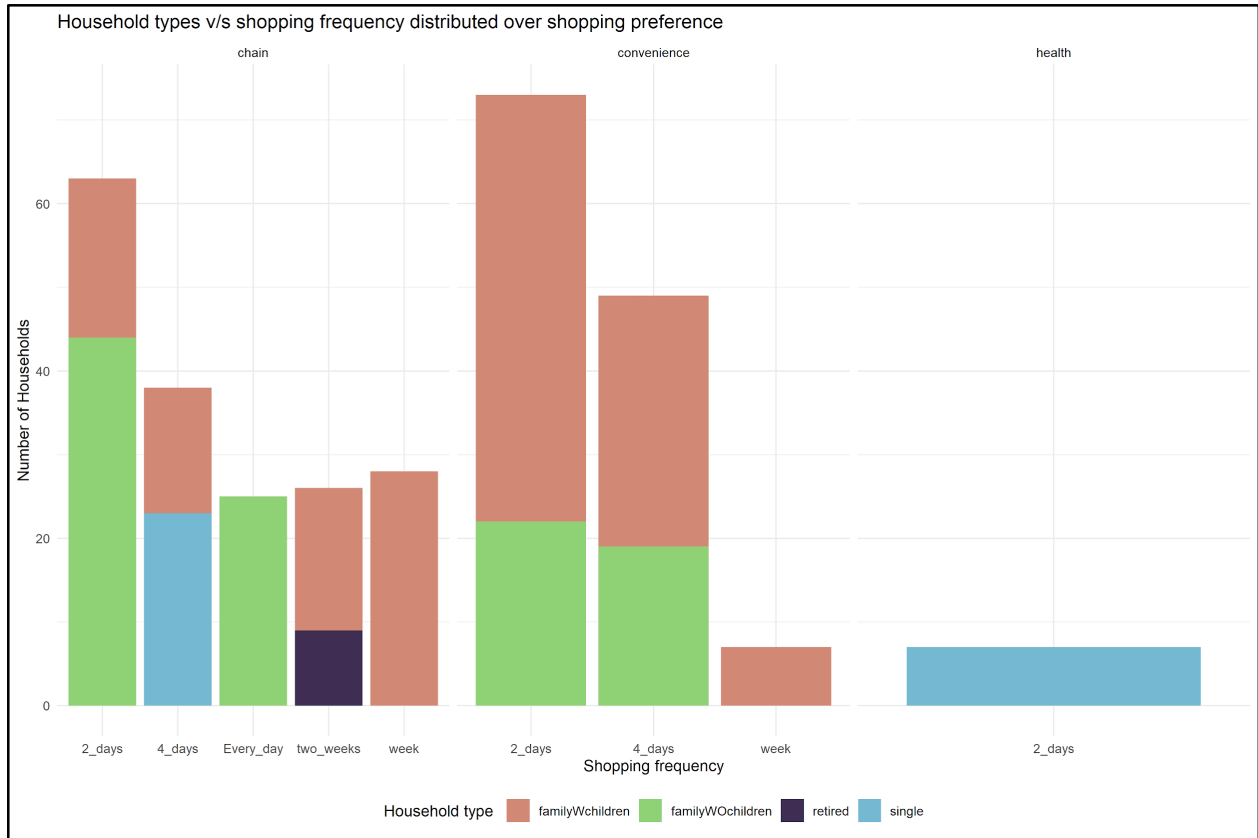
Labels and Titles can also be edited as per the below



Finally we can Export the resulting visual into png format



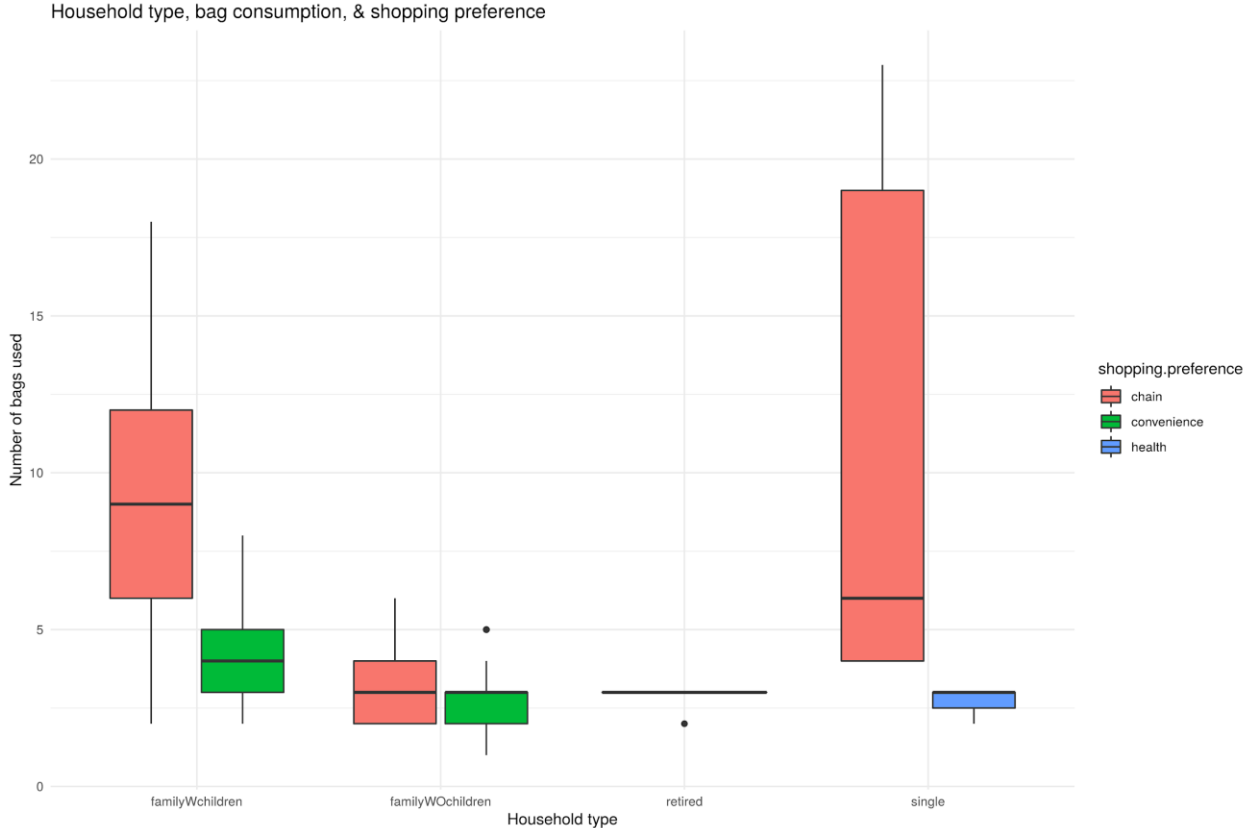
To get the following



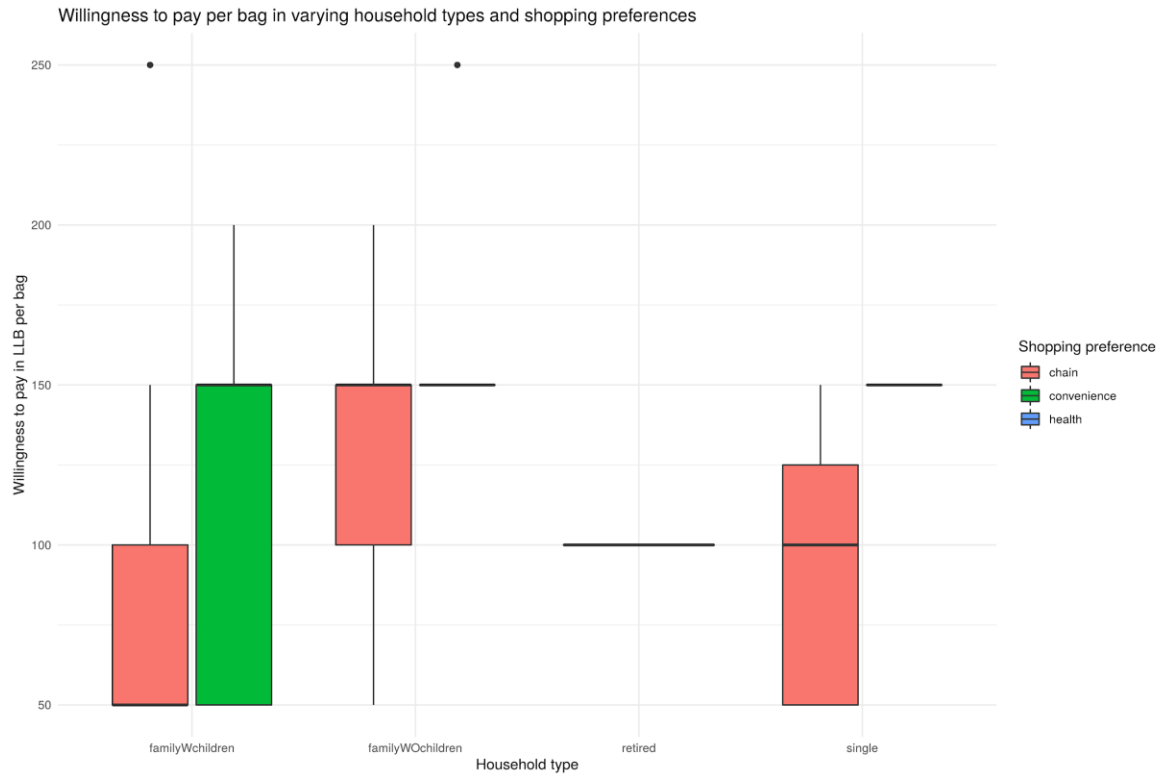
Findings per question

There are a great deal of interesting findings emerging from individual answers to our survey questions and from comparative analysis of various answers to the survey questions. In the belief of democratizing data analysis across the entirety of the available data and thereby reducing the biases associated with data communication by the researchers, we present below only some examples of findings to showcase the power of the plotting dashboard. We recommend interaction with the plotting dashboard to unbiasedly and comprehensively understand and draw findings from the Consumer Survey and and SME Survey.

Consumer example of comparative findings using the plotting dashboard

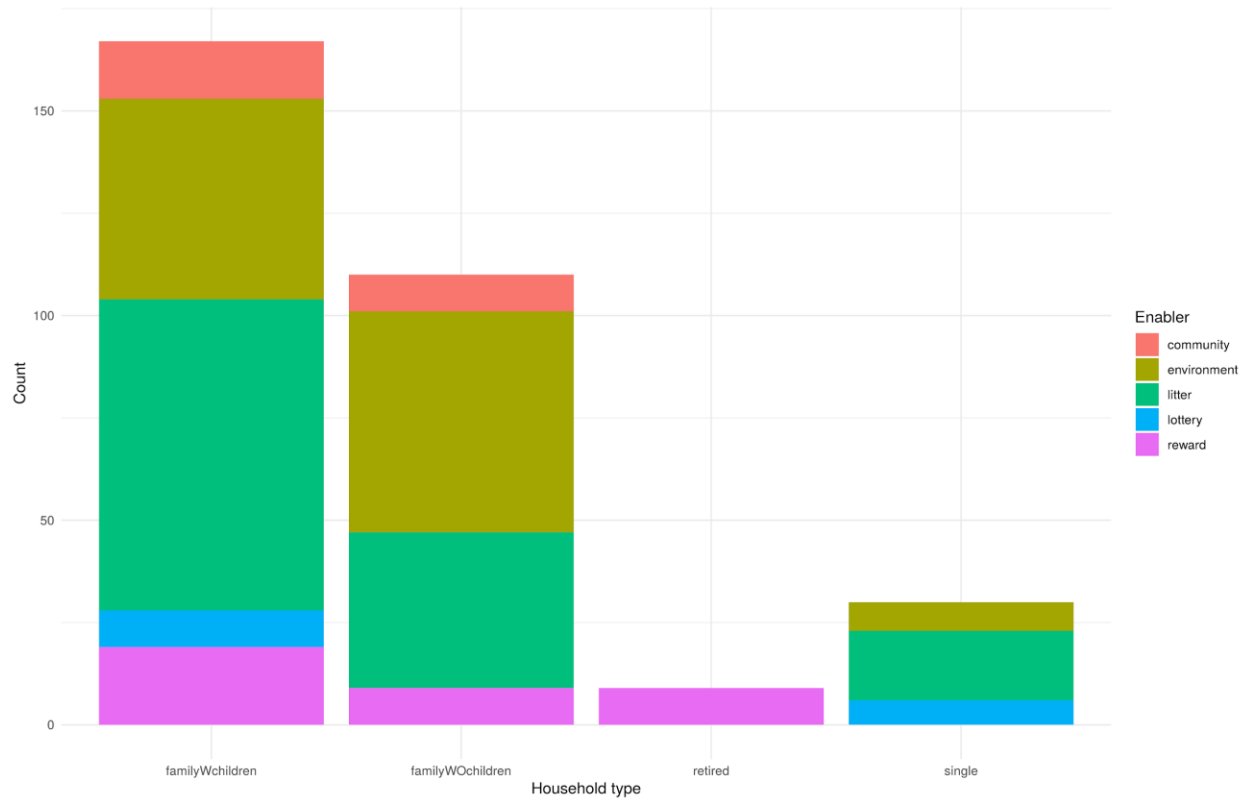


In this box and whisker plot the bold line provides the median and the bar above and below gives the 25% quartile for responses that are above and below the median. The line above and below the box presents the minimum and maximum response and the dots are the outliers that are not being reported. This plot shows that across HH types, customers of chain supermarkets consistently report using more plastic bags on average.



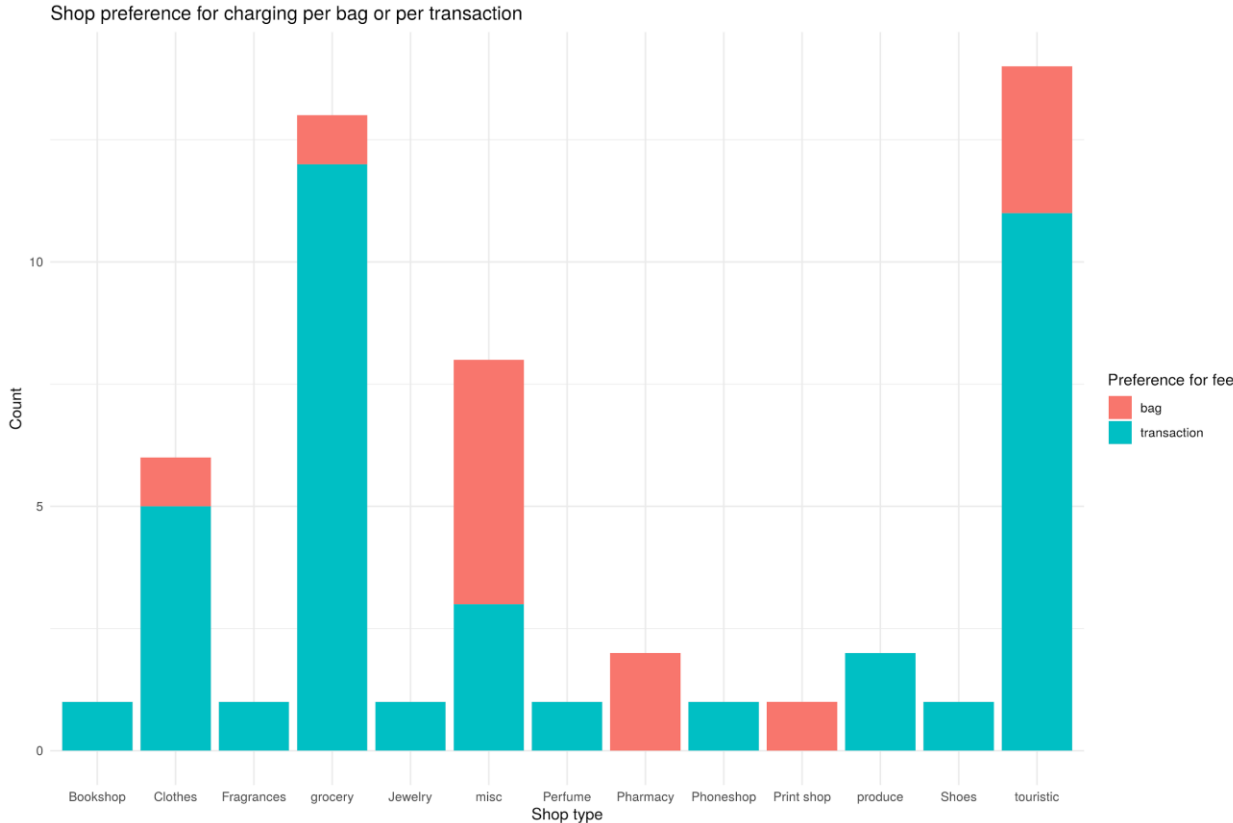
This box and whisker plot similarly shows that consumers shopping at convenience stores were consistently willing to pay more than those shopping in chain supermarkets

What causes different household types to want to bring a reusable bag

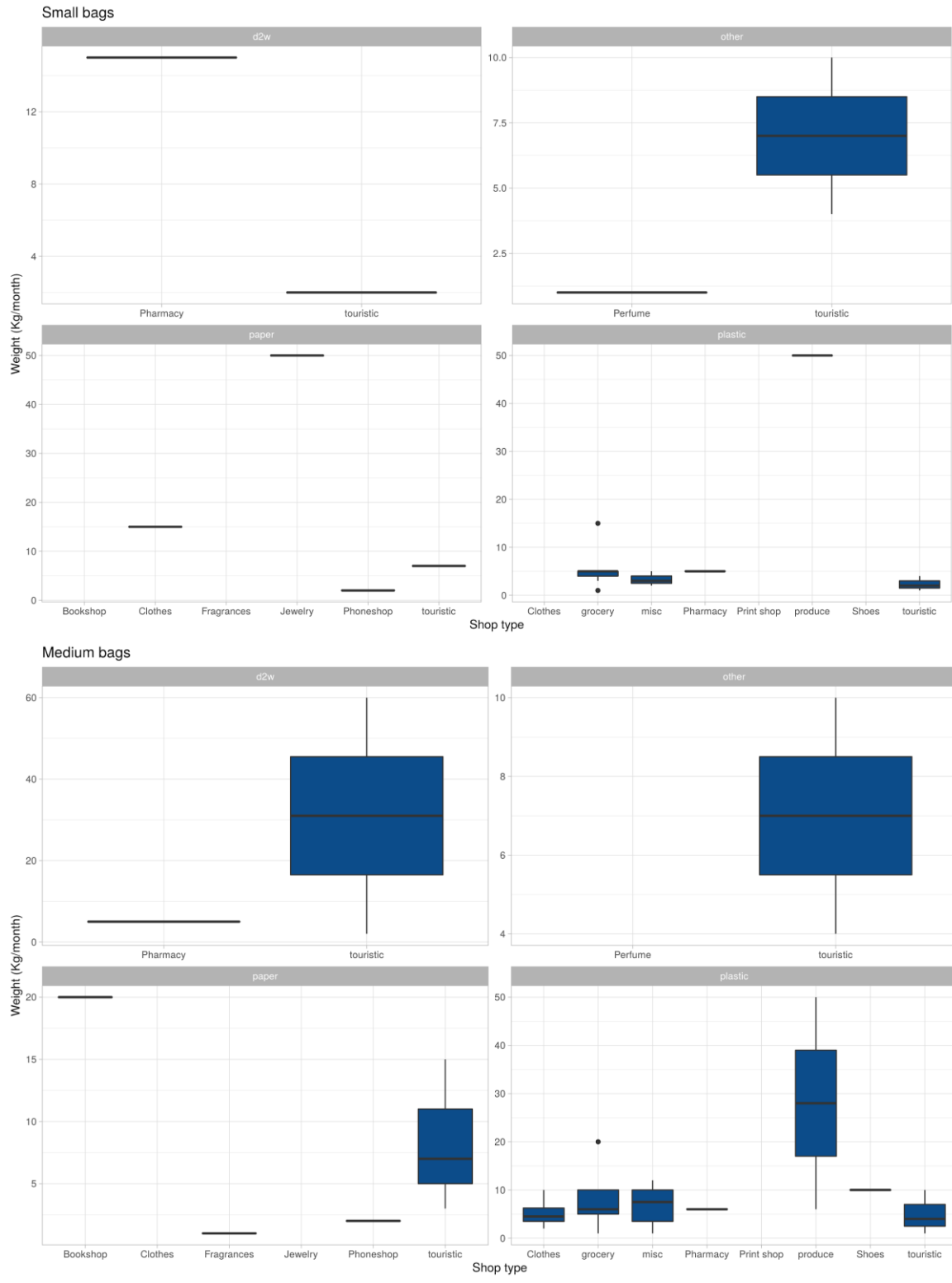


This shows that concern over environment and litter are the main enablers to bringing reusable bags across different household types

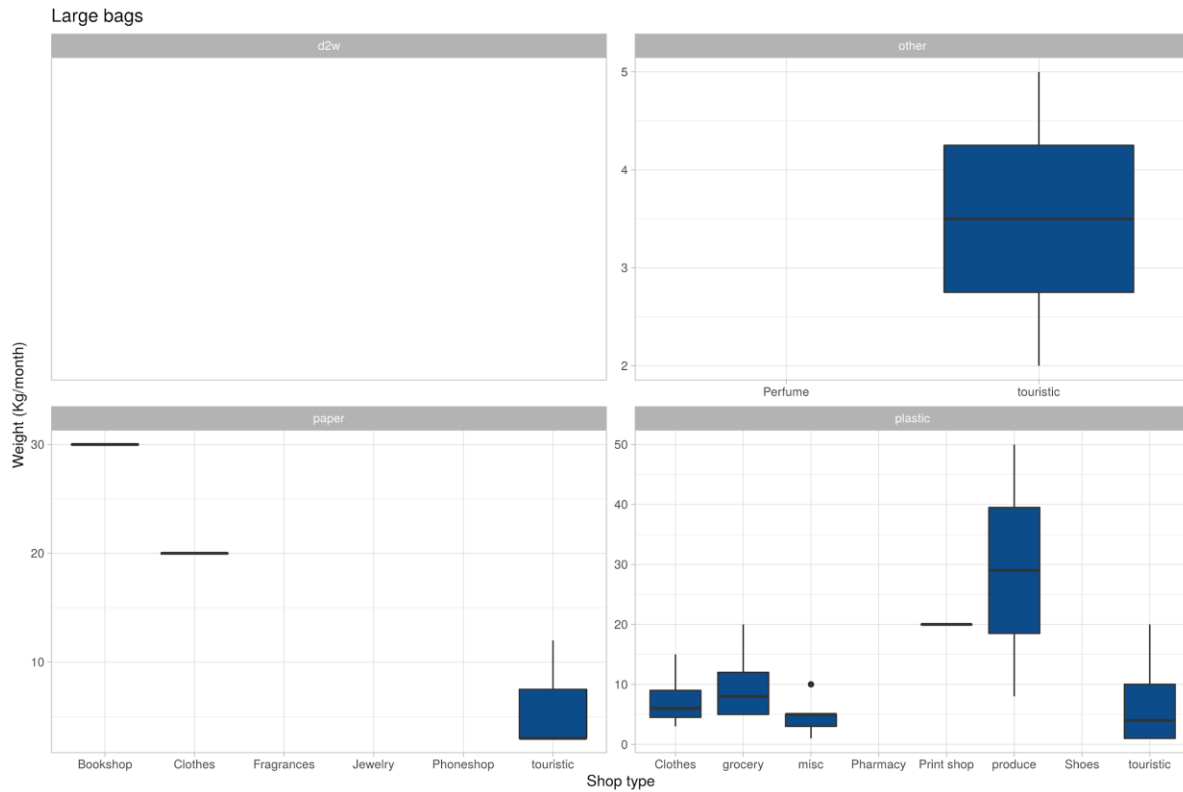
SME examples of comparative findings using the plotting dashboard



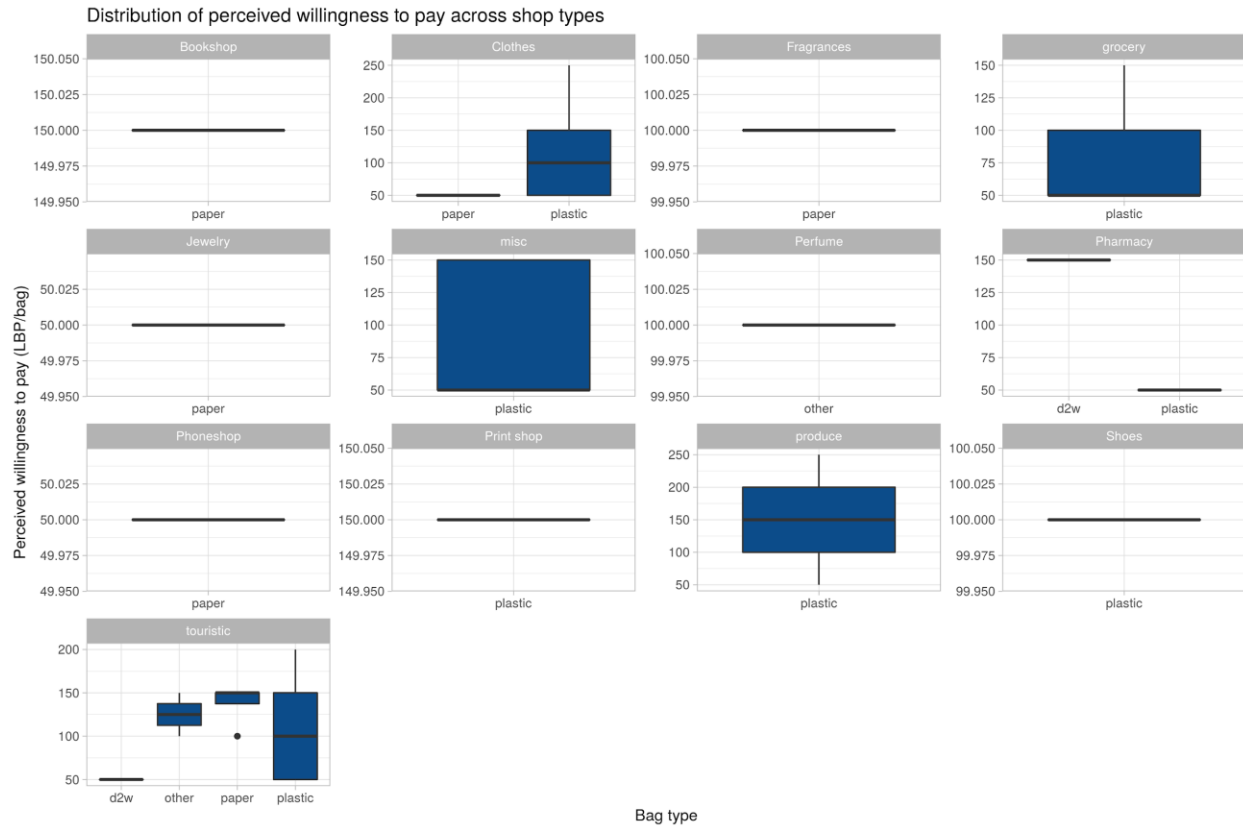
This shows that the majority of shop types prefer to charge a fee on the transaction instead of on each bag



These figures show no “Large” biodegradable (d2w) bags in the grocery market and their usage is restricted to “Small” and “Medium” sizes in pharmacies and tourist shops with pharmacies having the highest usage of “Small” d2w bags and tourist shops having the highest usage of “Medium” d2w bags.



Jewelry and clothing shops having the highest usage of “Small” paper bag usage, book shops and touristic shops the “Medium” and “Large” sizes. As for what the shops perceive the consumer to be willing to pay, all shop types regardless of the type of bag they are using perceive that the customer is willing to pay around 100 LBP per bag. Interestingly, although using more expensive bags, the shops using paper bags perceived that customers are willing to pay only 50 LBP/bag. Expectedly, touristic shops perceived that customers are willing to pay a higher amount per plastic bag.



The production of plastic bags in Lebanon and per capita consumption

We researched various methods for creating the most accurate and well founded estimate on production and consumption of single use plastic bags. Based on US patent 4,346,834 by Mobile Oil on the “production of Thermoplastic carrying bag”, these bags are made of **blended** polyethylene (PE) resins that are “particularly well suited for making seamless-wall handled strap bags from thin tubular film consisting essentially of a homogeneous blend of HDPE, LLDPE, and ordinary branched LDPE”. These bags consist “essentially of a ternary blend of about 5 to 20 wt.% HDPE, 20 to 70 wt.% LDPE, and 20 to 70 wt.% LLDPE”.

Given the composition of PE bags, we found that one of the methods to estimate production and consumption of single use plastic bags could be based on net imports of ethylene polymers with density < 0.94 . Even though we were able to work with Ministry of Industry to create a master list of all the plastic manufacturers (with some specification for who is manufacturing plastic bags), we found that the industry actors were reluctant to share information. Also, it is unknown exactly which of the 79 plastic industry actors are producing plastic bags. It was found, that Lebanon does not import ready made plastic bags but instead manufactures the bags in country with ethylene polymers with density < 0.94 imported primarily from Gulf countries. Given the thermoplasticity of PE and in consultations with industrialists we found PE waste from

manufacturing plastic bags to be minimal. Lebanon's total imports and exports of ethylene polymers with density < 0.94 were obtained from the United Nations International Trade Statistics 2017 dataset which is the most recent for the country. Figures extracted from this dataset show that, after adjusting for exports, Lebanon imports a total of 83.1 Million Kilograms of ethylene polymers with density < 0.94 yearly. Expert consultation revealed that around 70% of that amount is used in the production of plastic bags which computes to 58.17 Million Kilograms in 2017. This statistic is still questionable and requires further investigation.

Our SME survey shows that the small, medium and large categories of PE bags have market shares of 26%, 33% and 41% respectively with average number of bags per Kg being 125, 80 and 50. This means that the Lebanese average number of bags per Kg of PE bags is 79.4.

Given the above, the total Lebanese consumption of single use plastic bags in 2017 according to this method was 4.62 billion bags, which computes to 673 bags per person per year based on the latest population statistics of the United Nations at 6.85 million people. It can be assumed that these values remain accurate for 2019, given the minimal fluctuation in population since 2017 (6.81 million people) and no measures being enacted to reduce net imports, production, or demand from consumption of single use plastic bags in the country.

Another survey based method to estimate the consumption of single use plastic bags was also conducted and this will be the figure that is reported on with more confidence given the reduced number of assumptions made in the survey method. The survey is based on perceptions of single use bags with 316 consumers. Based on the survey conducted in Jbeil, the frequency of shopping and corresponding bag use is as follows: daily 8% using 3.28 bags on average, every two days 45% using 3.23 bags on average, every 4 days 28% using 6.25 bags on average, weekly 11% using 9.48 bags on average, every two weeks 8% using 10.57 bags on average. These results, assuming a population of 6.86M in Lebanon yield 4.01 billion bags per year (or a per capita average of 596 bags consumer per year). These numbers correspond well to the above estimation.