

# Information Acquisition and Sustainable Consumption: A Field Experiment

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  - Might avoid information to behave selfishly (Dana et al., 2007; Golman et al., 2017).
  - Information might be insufficient to encourage sustainable choices.
- Technology offers new ways to provide information on sustainability of own consumption.
  - Specific targeted information at individual level on purchased product and close substitutes.

# This Project

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## Method

- Field RCT with App users (ReciclaYa) from Carrefour in Spain.
- Treatment intervention offering optional information on recycled material of purchased plastic water bottles and close substitutes.
- Preregistered at [aspredicted.org](https://aspredicted.org) Num. 107257.

## Related Literature and Contributions

- Information avoidance (e.g., Dana et al., 2007; Hertwig and Engel, 2016; Golman et al., 2017), particularly in context of environmental consequences (e.g., d'Adda et al., 2018; Lind et al., 2019; Momsen and Ohndorf, 2020, 2022; Reisch et al., 2021)  
→ Investigate acquisition of information on product sustainability **in the field**.
- Effectiveness of providing mandatory information on the environmental impact of consumption (e.g., Newell and Siikamäki, 2014; Camilleri et al., 2019; Fosgaard et al., 2021; Takahashi, 2021; Andor et al., 2022)  
→ Focus on provision of **optional information**.
- Credence Goods (e.g., Dulleck and Kerschbamer, 2006; Kerschbamer et al., 2019; Balafoutas and Kerschbamer, 2020; Schneider et al., 2021)  
→ Optional information interventions for **label credence goods**.

# Experimental Design

## Background Information

### **The App – ReciclaYa (Carrefour)**

- Provides information on how to recycle purchased products (after scanning the bill).
- Each recycling action gives points (that can be redeemed for small discounts).

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## The Products

- Label credence goods: Plastic water bottles from 2 brands from Danone.

○ Font Vella (**0–25% recycled plastic**)



○ Lanjarón (**100% recycled plastic**)



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1.5l

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- **Treatment:**

- (1) *Thank you* for purchasing the product.
- (2) Offer to receive **information** about recycled material of purchased and related products.
- (3) [If yes:] Information about recycled material of 4 bottles (2 of each brand).
- (4) Choose a 5 € voucher for one of the two brands.

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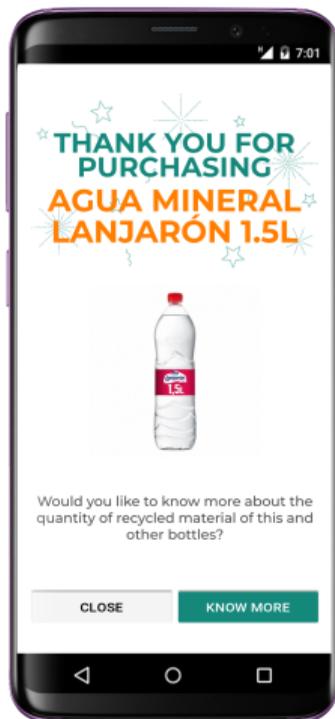
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- **Control:**

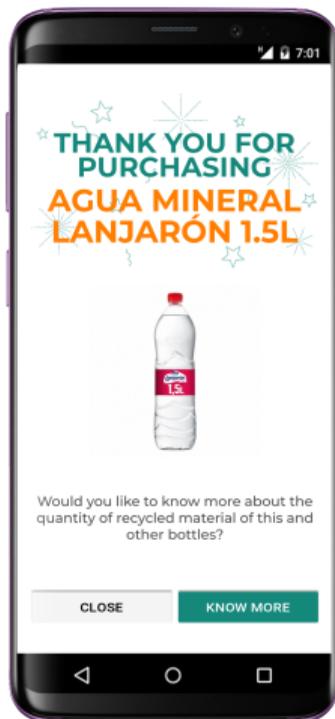
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## Implementation (Treatment)



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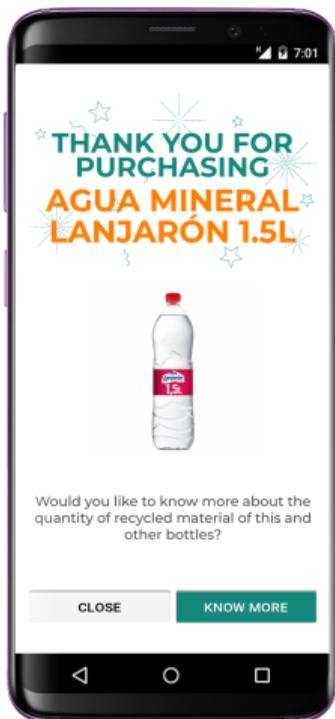


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- (3) Info [if selected]

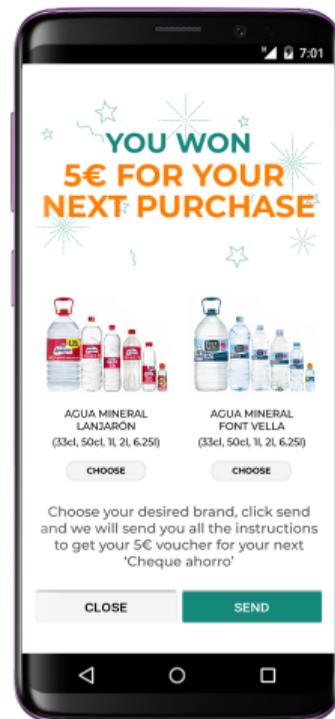
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(3) Info [if selected]



(4) Voucher choice

# Sample

- Duration of experiment: **September 23, 2022 – December 3, 2022** (at which point the pre-registered sample size of 1.000 valid voucher choices was reached)

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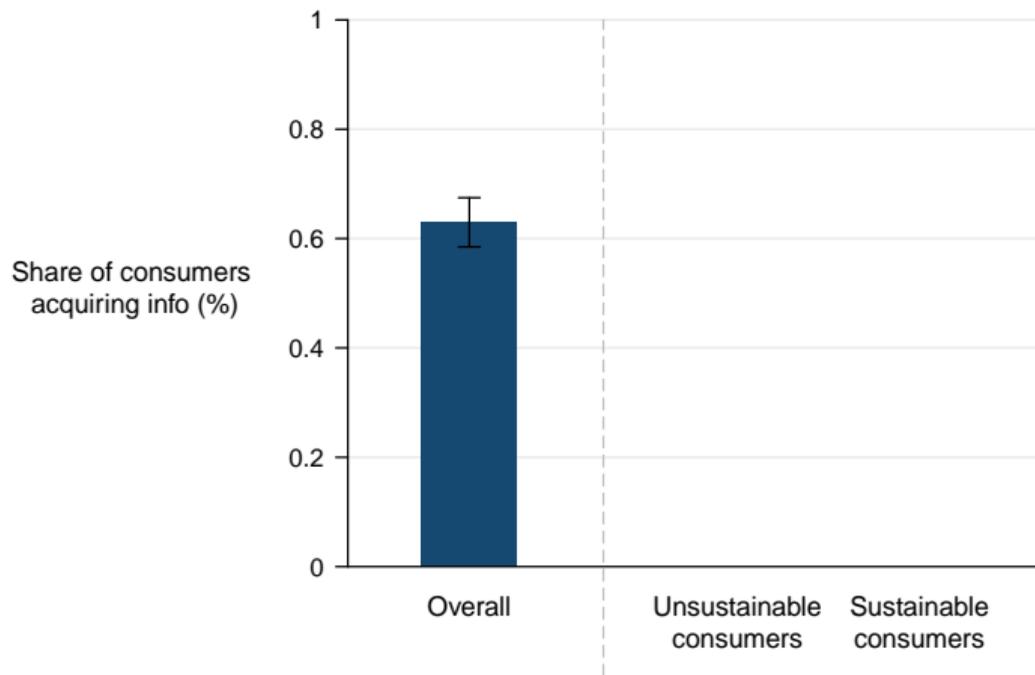
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- Exclusion Criteria
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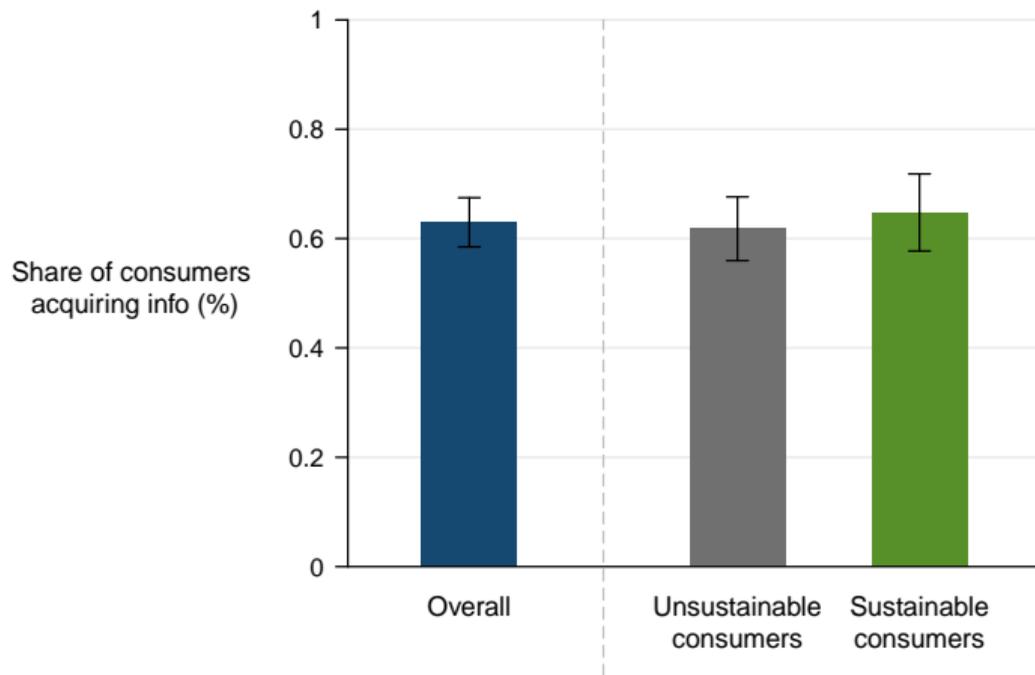
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  - Users with technical issues ( $N = 1$ )
- Final sample: **988 app users** (542 control, 446 treatment)
  - 40% upload a product from “sustainable” brand (→ “**sustainable**” consumers)

# Results

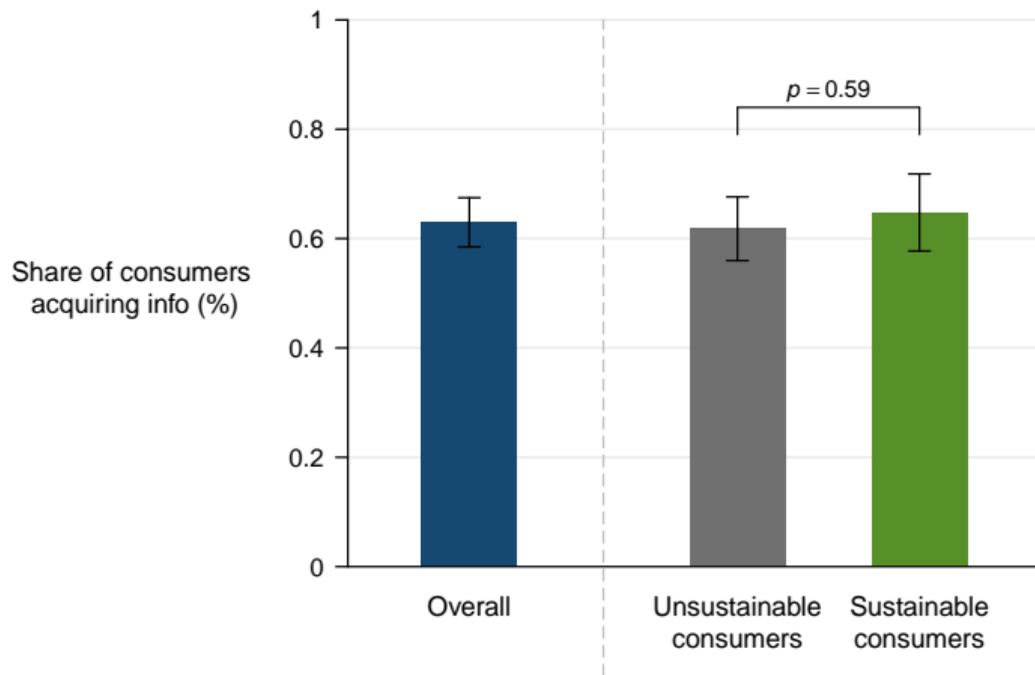
# Information Acquisition



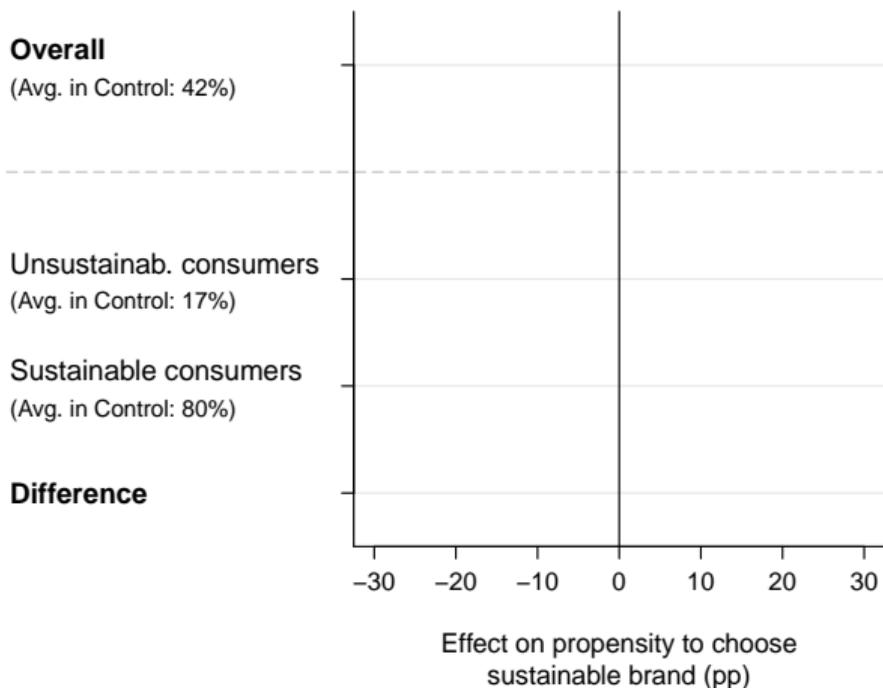
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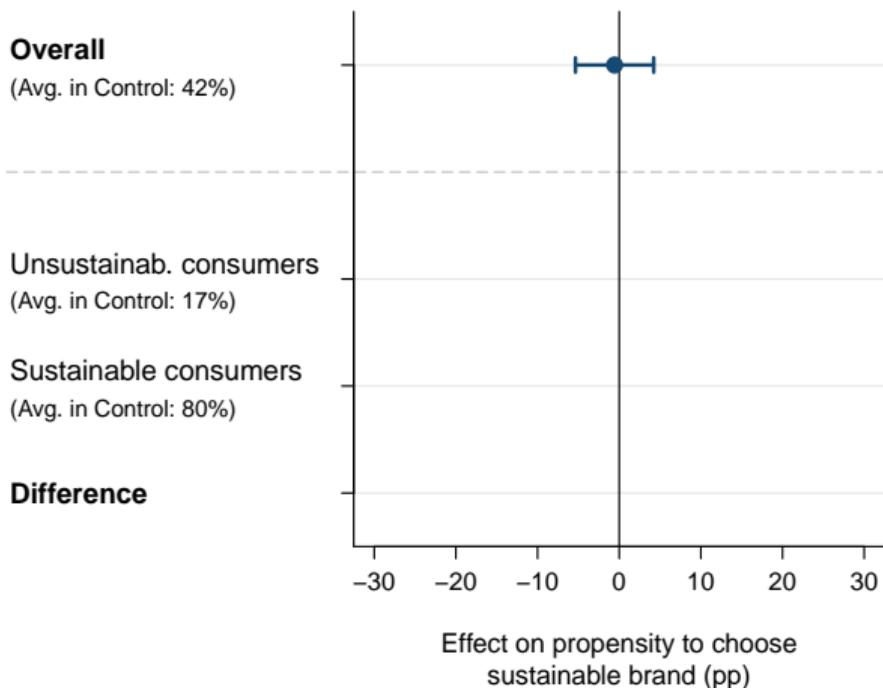


# Effect of Intervention on Propensity to Choose Sustainable Brand



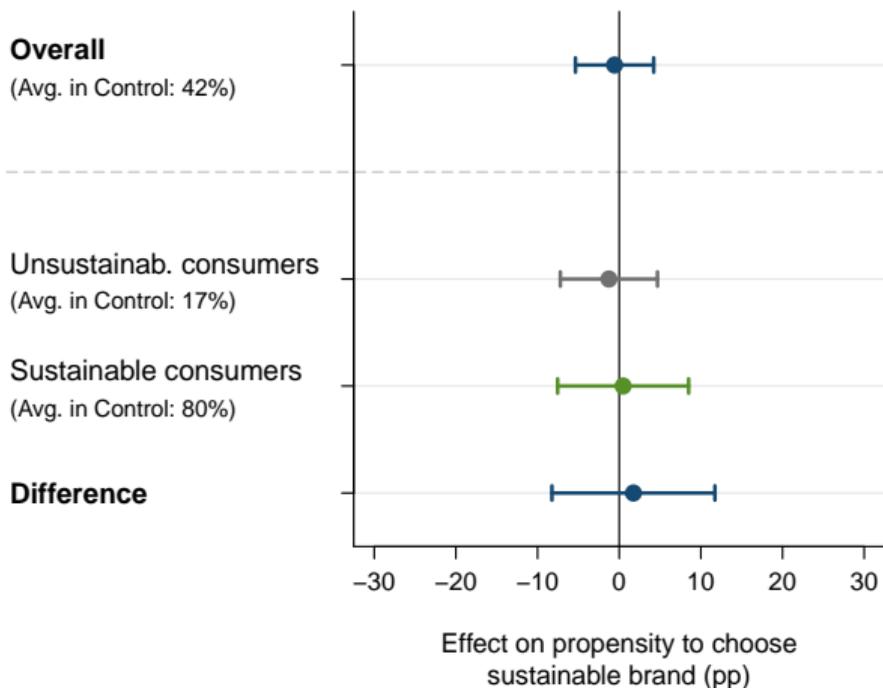
▶ Table

# Effect of Intervention on Propensity to Choose Sustainable Brand



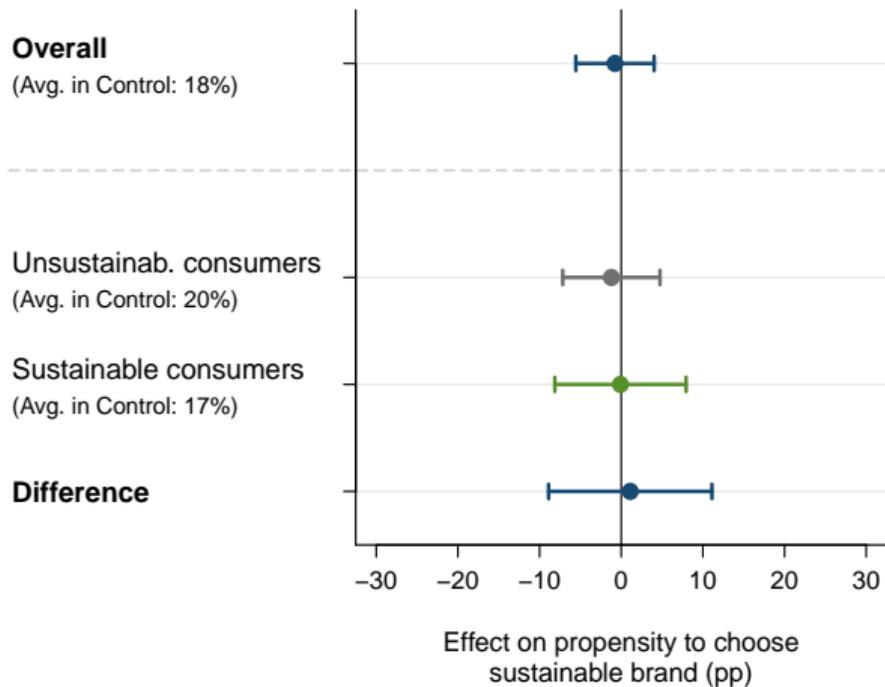
▶ Table

# Effect of Intervention on Propensity to Choose Sustainable Brand



▶ Table

# Effect of Intervention on Propensity to Switch the Brand



# Investigating Reasons for Lack of Effectiveness

## Path Dependence

- 82% of consumers choose a voucher for the brand of the **initial purchase**.
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## Intention to Cheat

- 10% of users upload an old purchase **after** their voucher choice that match the voucher brand.
- 83% of all uploads of an old purchase after the voucher choice match the voucher brand.
- Excluding “cheaters” does not affect the results.

# Robustness

- The treatment affects the propensity to choose a voucher. [▶ Details](#)
- Results are robust to classifying individuals based on history of purchasing behavior before the experiment. [▶ Details](#)
- No effect on observed purchasing behavior during and after voucher period. [▶ Details](#)
- Demand for considered products is responsive to incentives [▶ Details](#)

# Conclusion

## Good news

- High voluntary information acquisition.
- No significant difference in information acquisition by purchasing history.
- Brown consumers do not seem to strategically avoid green information about products.

## Bad news

- Offering voluntary information on sustainability of purchased product and close substitutes does not lead to significantly more sustainable consumption preferences.
- Strong path dependence in product choice that is unlikely to be explained by a lack of information processing or an intention to cheat.
- Information interventions in isolation might not be enough for triggering (substantial) behavioral change.

**Information interventions might still be useful as part of policy packages that combine increased awareness on products' sustainability with other boosts to behavioral change.**

Thank you

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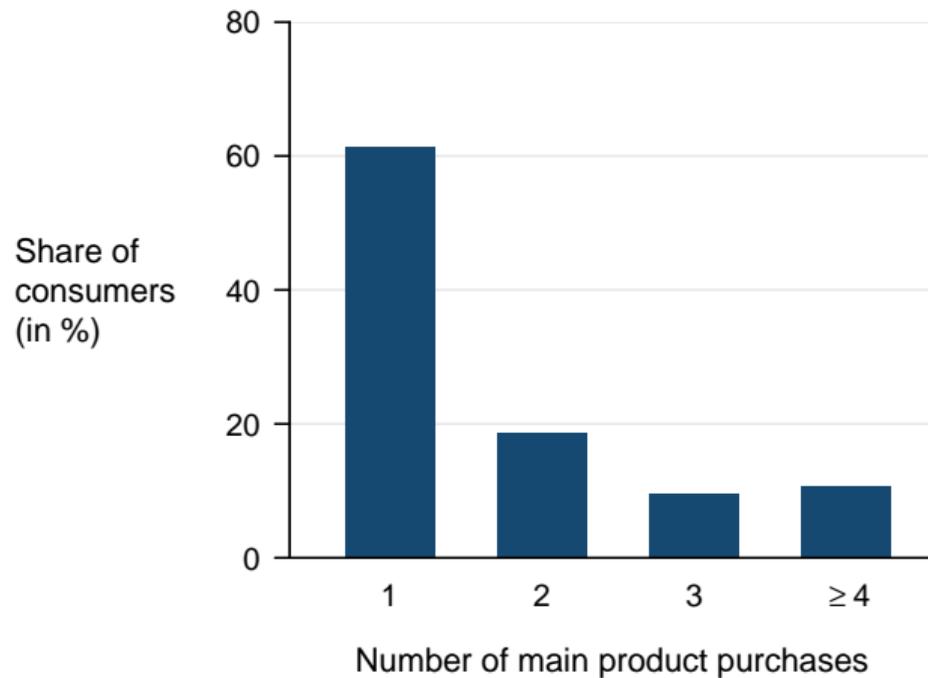
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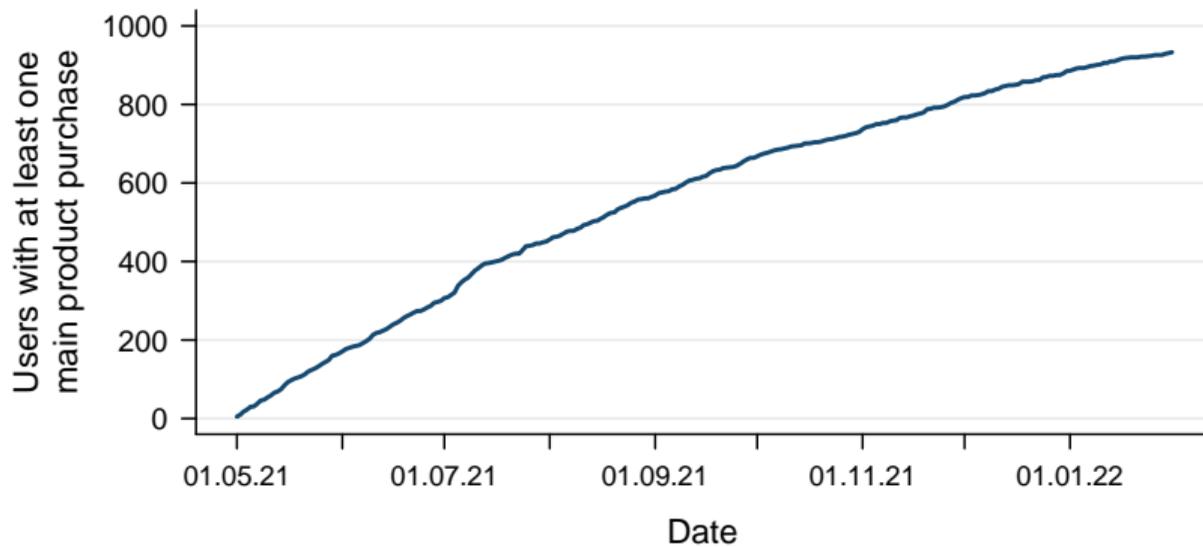
# Measuring Effect on Consumption Choices

- **Major Challenge:** Products are only **bought occasionally**
  - Within 6 months, 61% of consumers buy at most once a product from the set (cond. on buying any) ▶ Distribution
  - Insufficient power to estimate ITT based on naturally occurring consumption choices

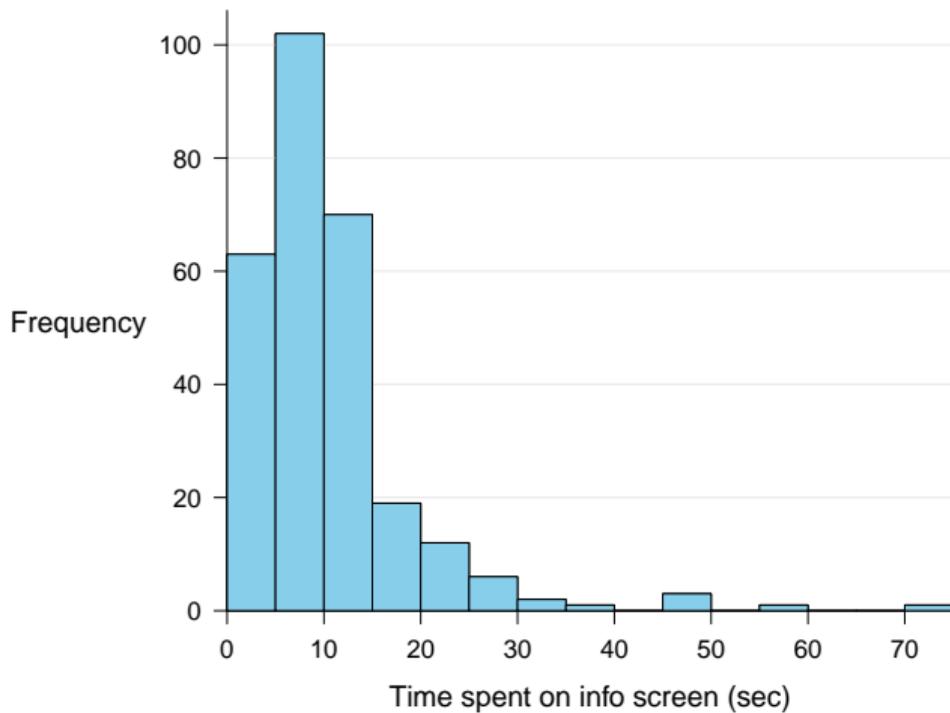
## Number of Purchases



## Sample Size over Time



## Distribution of Time Spent on Info Screen



## Estimation Results – Propensity to Choose Sustainable Brand

	ATE		Effect heterogeneity	
Treated	-0.006 (0.024)	-0.002 (0.025)	-0.013 (0.030)	-0.010 (0.032)
Sustainable consumer	0.638*** (0.025)	0.638*** (0.026)	0.630*** (0.034)	0.629*** (0.035)
Treated × sustainable consumer			0.017 (0.051)	0.019 (0.028)
Constant	0.163*** (0.019)	0.183* (0.098)	0.166*** (0.021)	0.187* (0.099)
Additional controls	No	Yes	No	Yes
Observations	984	959	984	959
R <sup>2</sup>	0.4	0.4	0.4	0.4

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . Control variables are gender, age (below 30, 30–60, above 60), whether individual lives in a single household, whether individual has used the app before 2022, and whether the individual reports that he/she recycles.



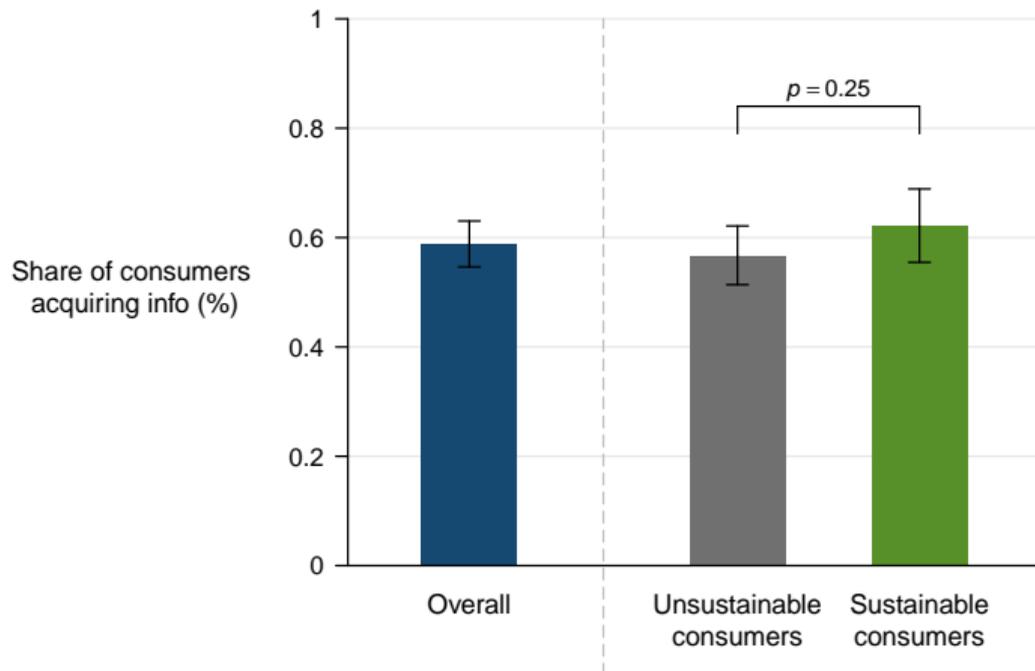
## Attrition by Treatment Status

	Control (%)	Treatment (%)	$\chi^2$ -test ( <i>p</i> -value)
Share receiving thank you message	99.7	99.8	
Share receiving voucher choice message	97.5	95.6	0.13
Share with voucher choice	96.0	89.8	0.00
Share with valid voucher choice	91.2	84.1	0.00

⇒ There is differential attrition by treatment status from the point of making the voucher choice onward (but not before!).



# Information Acquisition including All (Assigned) Individuals



## Voucher Choice including All (Assigned) Individuals

	Voucher Choice					
	None		Sustainable		Unsustainable	
Treated	0.062*** (0.016)	0.067*** (0.021)	-0.032 (0.024)	-0.032 (0.028)	-0.030 (0.025)	-0.035 (0.033)
Sustainable consumer	-0.022 (0.015)	-0.016 (0.016)	0.588*** (0.025)	0.588*** (0.035)	-0.566*** (0.025)	-0.572*** (0.035)
Treated × sustainable consumer		-0.013 (0.031)		-0.001 (0.051)		0.014 (0.050)
Constant	0.049*** (0.010)	0.047*** (0.011)	0.176*** (0.018)	0.176*** (0.020)	0.775*** (0.020)	0.777*** (0.022)
Observations	1,120	1,120	1,120	1,120	1,120	1,120
R <sup>2</sup>	0.02	0.02	0.35	0.35	0.31	0.31

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .



## Valid Voucher Choice including All (Assigned) Individuals

	Valid Voucher					
	No		Sustainable		Unsustainable	
Treated	0.071*** (0.020)	0.074*** (0.027)	-0.033 (0.023)	-0.023 (0.026)	-0.039 (0.026)	-0.051 (0.034)
Sustainable consumer	-0.053*** (0.019)	-0.050** (0.022)	0.590*** (0.025)	0.603*** (0.034)	-0.537*** (0.025)	-0.552*** (0.035)
Treated × sustainable consumer		-0.006 (0.039)		-0.027 (0.051)		0.033 (0.051)
Constant	0.108*** (0.015)	0.107*** (0.016)	0.153*** (0.018)	0.148*** (0.019)	0.738*** (0.020)	0.745*** (0.023)
Observations	1,120	1,120	1,120	1,120	1,120	1,120
R <sup>2</sup>	0.02	0.02	0.35	0.35	0.31	0.31

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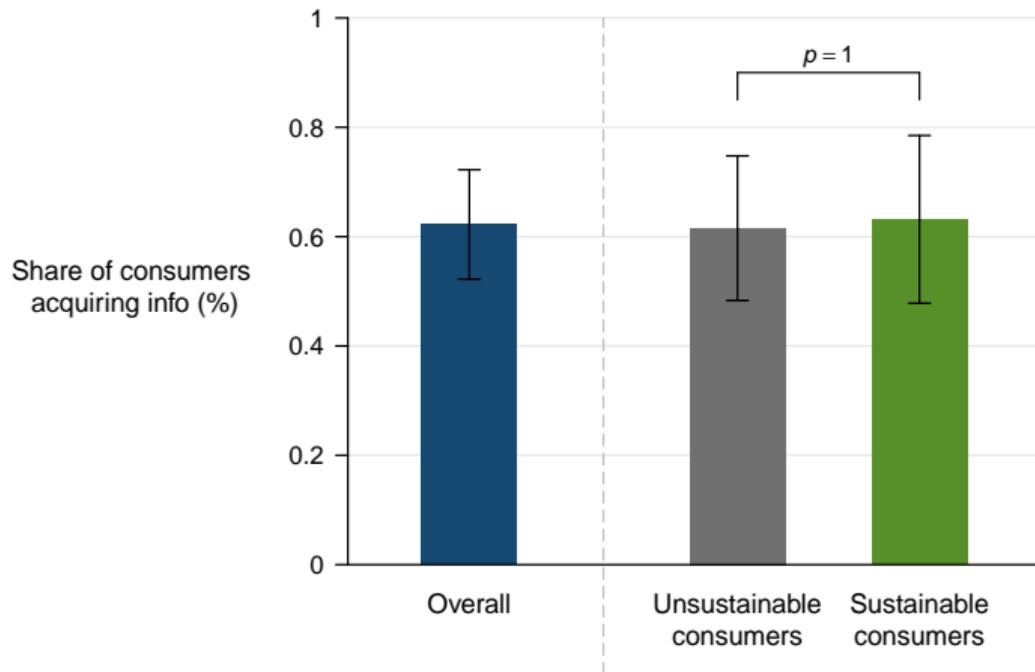


## Pre-experimental Behavior by Consumer Type

Variable	Unsustainable Consumer	Sustainable Consumer	Comparison ( $p$ -value)
sustainable units	1.04 (0.22)	3.29 (0.79)	0.01
unsustainable units	2.61 (0.42)	0.80 (0.17)	0.00
sustainable liters	1.89 (0.39)	6.60 (1.51)	0.00
unsustainable liters	4.43 (0.71)	1.19 (0.27)	0.00
recycled plastic	34.77 (6.58)	107.45 (24.72)	0.00
nonrecycled plastic	68.19 (11.03)	18.86 (3.90)	0.00



# Information Acquisition by Alternative Classification



## Voucher Choice under Alternative Classification

	Voucher Choice					
	None		Sustainable		Unsustainable	
Treated	0.012 (0.012)	0.000 (0.000)	0.020 (0.062)	0.009 (0.078)	-0.032 (0.062)	-0.009 (0.078)
Sustainable consumer	0.010 (0.011)	0.000 (0.000)	0.385*** (0.062)	0.375*** (0.080)	-0.395*** (0.062)	-0.375*** (0.080)
Treated × sustainable consumer		0.026 (0.027)		0.026 (0.128)		-0.053 (0.128)
Constant	-0.005 (0.005)	0.000 (0.000)	0.217*** (0.046)	0.222*** (0.050)	0.787*** (0.046)	0.778*** (0.050)
Observations	224	224	224	224	224	224
R <sup>2</sup>	0.0	0.0	0.2	0.2	0.2	0.2

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .



## Purchases of Units during Voucher Period

	Purchased Units					
	None		Sustainable		Unsustainable	
Treated	0.018 (0.030)	0.027 (0.038)	-0.108 (0.248)	-0.194 (0.209)	-0.560* (0.331)	-0.729 (0.476)
Sustainable consumer	-0.042 (0.031)	-0.032 (0.042)	2.603*** (0.298)	2.498*** (0.435)	-2.329*** (0.313)	-2.536*** (0.467)
Treated × sustainable consumer		-0.021 (0.061)		0.224 (0.592)		0.440 (0.620)
Constant	0.468*** (0.024)	0.464*** (0.026)	0.641*** (0.173)	0.681*** (0.170)	3.775*** (0.302)	3.854*** (0.351)
Observations	1,120	1,120	1,120	1,120	1,120	1,120

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .



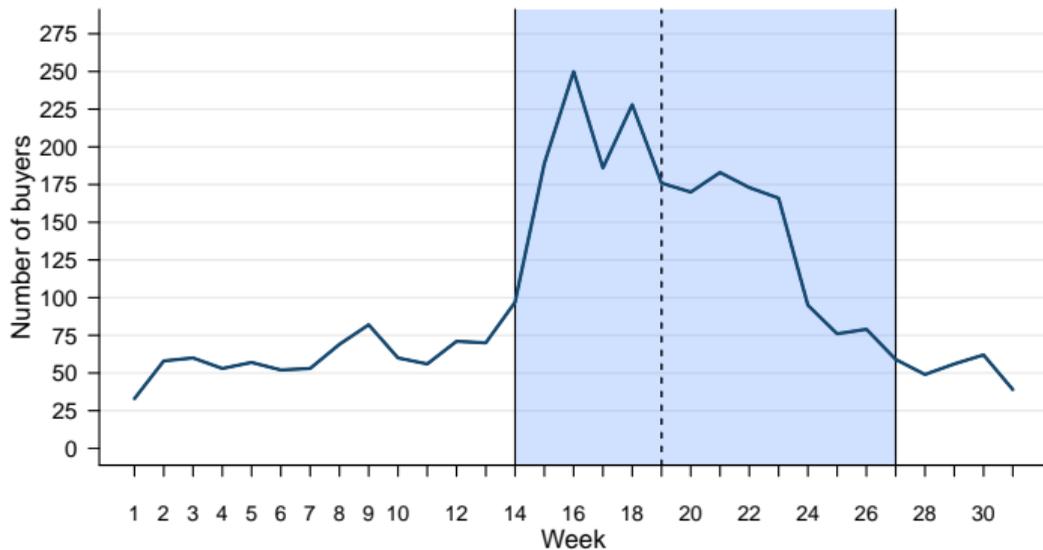
## Purchases of Units after Voucher Period

	Purchased Units					
	None		Sustainable		Unsustainable	
Treated	-0.004 (0.027)	-0.016 (0.034)	-0.374* (0.219)	-0.220 (0.179)	-0.050 (0.372)	-0.455 (0.550)
Sustainable consumer	-0.005 (0.028)	-0.019 (0.038)	1.171*** (0.267)	1.359*** (0.412)	-1.566*** (0.337)	-2.062*** (0.439)
Treated × sustainable consumer		0.031 (0.055)		-0.402 (0.525)		1.055 (0.679)
Constant	0.725*** (0.021)	0.731*** (0.023)	0.609*** (0.152)	0.536*** (0.149)	2.534*** (0.343)	2.725*** (0.400)
Observations	1,120	1,120	1,120	1,120	1,120	1,120

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# Consumption Volume of Considered Products over Time



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