

Information Acquisition and Sustainable Consumption: A Field Experiment

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November, 2023
ECOBAS

Motivation

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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

Research Questions

1. Information acquisition

- 1.1 To what extent do consumers acquire costless information about products' sustainability?
- 1.2 How does information acquisition differ between consumers of sustainable and unsustainable products?

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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 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).
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- 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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- **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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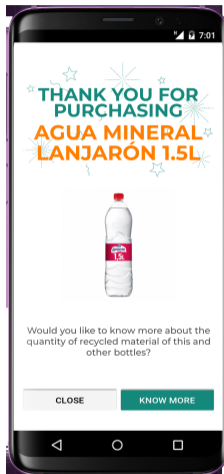
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- **Control:**

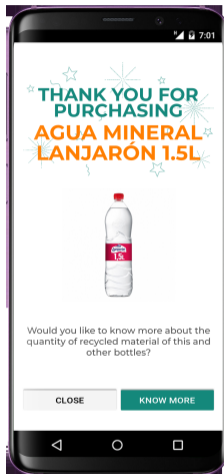
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Implementation (Treatment)



- (1) Thank you +
- (2) info offer

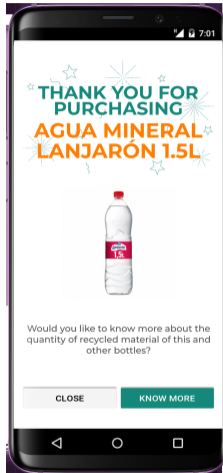
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Implementation (Treatment)



(1) Thank you +
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(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)

Sample

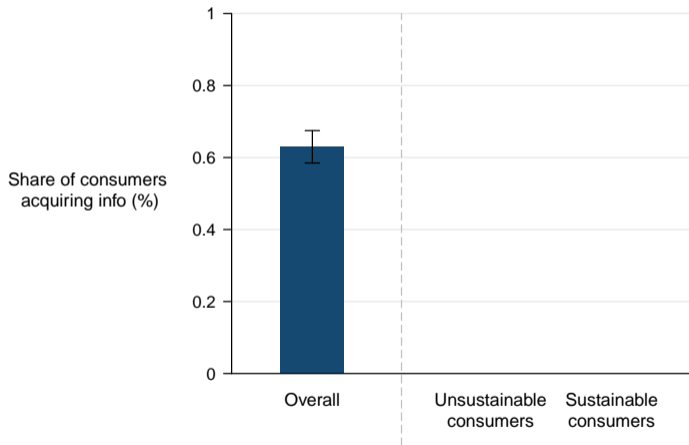
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 - Users with invalid voucher choice ($N = 142$)
 - Users who uploaded a green and a brown product ($N = 11$)
 - Users with technical issues ($N = 1$)

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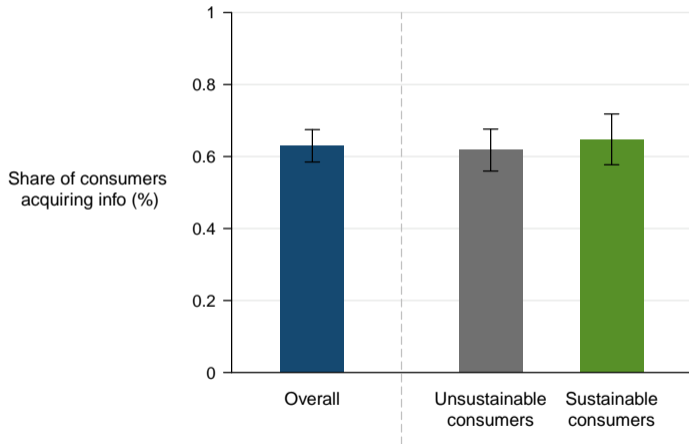
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 - Users with technical issues ($N = 1$)
- Final sample: **988 app users** (542 control, 446 treatment)
 - 40% upload a product from “sustainable” brand (“**sustainable**” consumers)

Results

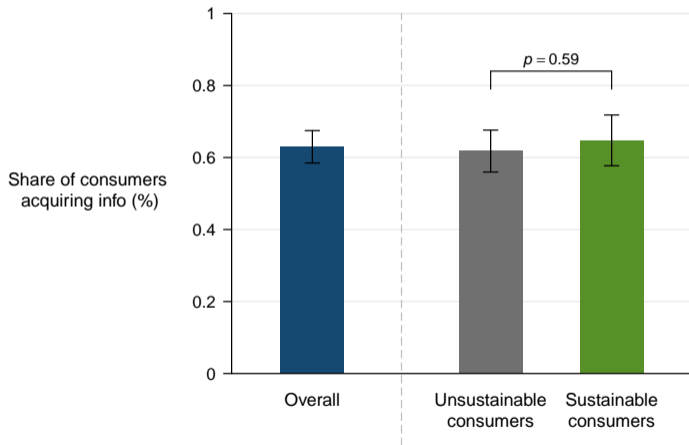
Information Acquisition



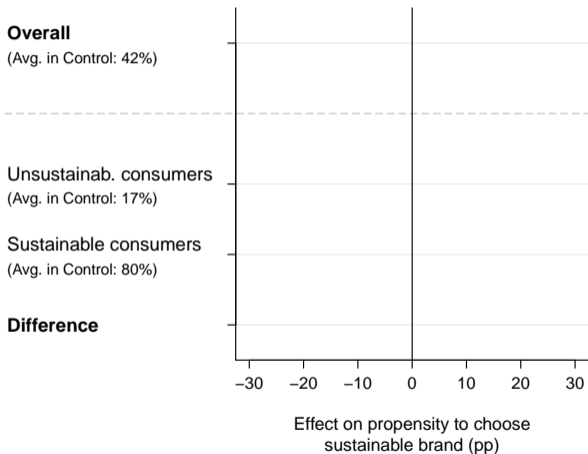
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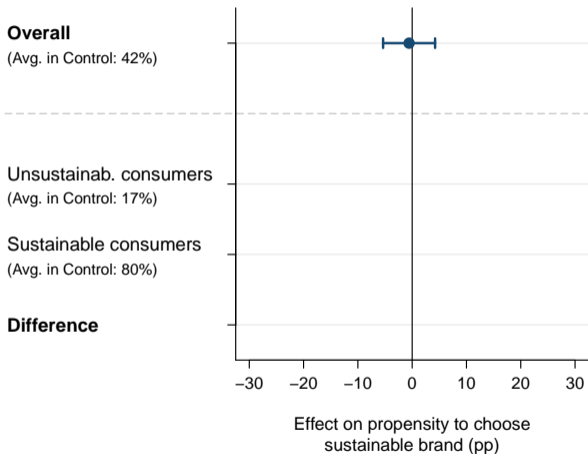


Effect of Intervention on Propensity to Choose Sustainable Brand



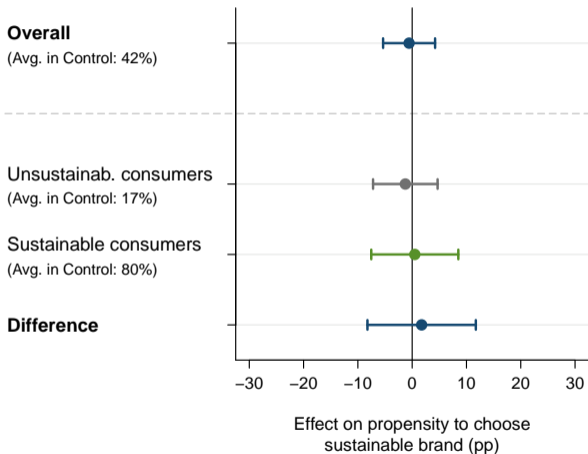
▶ Table

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 their 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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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 ²	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 (%)	χ^2 -test (p-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 ²	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 ²	0.02	0.02	0.35	0.35	0.31	0.31

*p < 0:1, ** p < 0:05, *** p < 0:01.



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 ²	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

*p < 0:1, ** p < 0:05, *** p < 0:01.



Consumption Volume of Considered Products over Time



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