

Transparency of Carbon-Neutral Labels

Evidence from a Choice Experiment

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Motivation

- Carbon-neutral labels often do not explain **how neutrality is achieved**.
- Firms face investor and board pressure to make net-zero commitments.
- 63%** of Forbes Global 2000 companies have carbon-neutral or net-zero targets.
- Concerns about CO₂ offsetting include:
 - Practical concerns:** additionality, credibility, double counting, leakage, and uncertain long-run abatement.
 - Ethical concerns:** moral licensing and the commodification of nature.
- The European Parliament has adopted rules banning **unverified environmental claims**.
- UK guidance** recommends disclosing the roles of reductions and offsetting in neutrality claims.

Research Questions

- To what extent do consumers value **transparency about offsetting and reduction shares** on carbon-neutral labels?
- Do consumers value **CO₂ reductions and CO₂ offsets** differently?
- How does the **presence of other sustainability labels** affect willingness to pay (WTP) for carbon-neutral labels?

Survey and Experimental Design

Survey. Pre-registered discrete choice experiment targeting tea consumers in **the UK**.

Pilot 157 participants
Main survey 1,339 participants
Analyzed sample 1,321 participants (excluding protest responses)
Product 80 teabags or a 200-gram tea box

Experimental groups

	Control	Treatment 1	Treatment 2
Carbon-neutral label			
CO ₂ offset share	No information	95%	50%
CO ₂ reduction share	No information	5%	50%
Participants	448	447	444

Choice attributes

Attribute	Levels
Carbon-neutral label	Yes / No
Organic label	Yes / No
Ethical trade label	Yes / No
Price (£)	0.90, 1.90, 2.90, 3.90, 4.90, 5.90, 6.90

- 16 choice cards in two blocks
- Two tea alternatives plus a none-of-these option

Tea product A

☒ No label

☒ No label

☒ No label

Price of tea product A

£3.9

I choose...

Tea product B

☒ No label

☒ No label

☒ No label

Price of tea product B

£2.9

None of the two

NEITHER TEA A
NOR TEA B

Price

£0

Empirical Approach

- Mixed logit in WTP space:
$$U_{inj} = -\alpha_i(p_{inj} - \mathbf{w}_i^T \mathbf{X}_{inj}) + s_{in} + \varepsilon_{inj}$$
 - $\alpha_i > 0$ is the utility scale, $\mathbf{w}_i$ is the MWTP vector, and s_{in} is the status quo utility.
- Group comparisons:** pairwise MWTP differences are tested using Poe et al. (2005).
- Multiple testing:** p-values are adjusted with the Holm–Bonferroni method.

Results

Main finding: consumers value the carbon-neutral claim, but transparency alone does not raise WTP.

MWTP estimates (£)

	Control	Treatment 1	Treatment 2
MWTP (£)	0.55***	0.52***	0.32***
Std. error	(0.08)	(0.10)	(0.09)

Holm-corrected significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

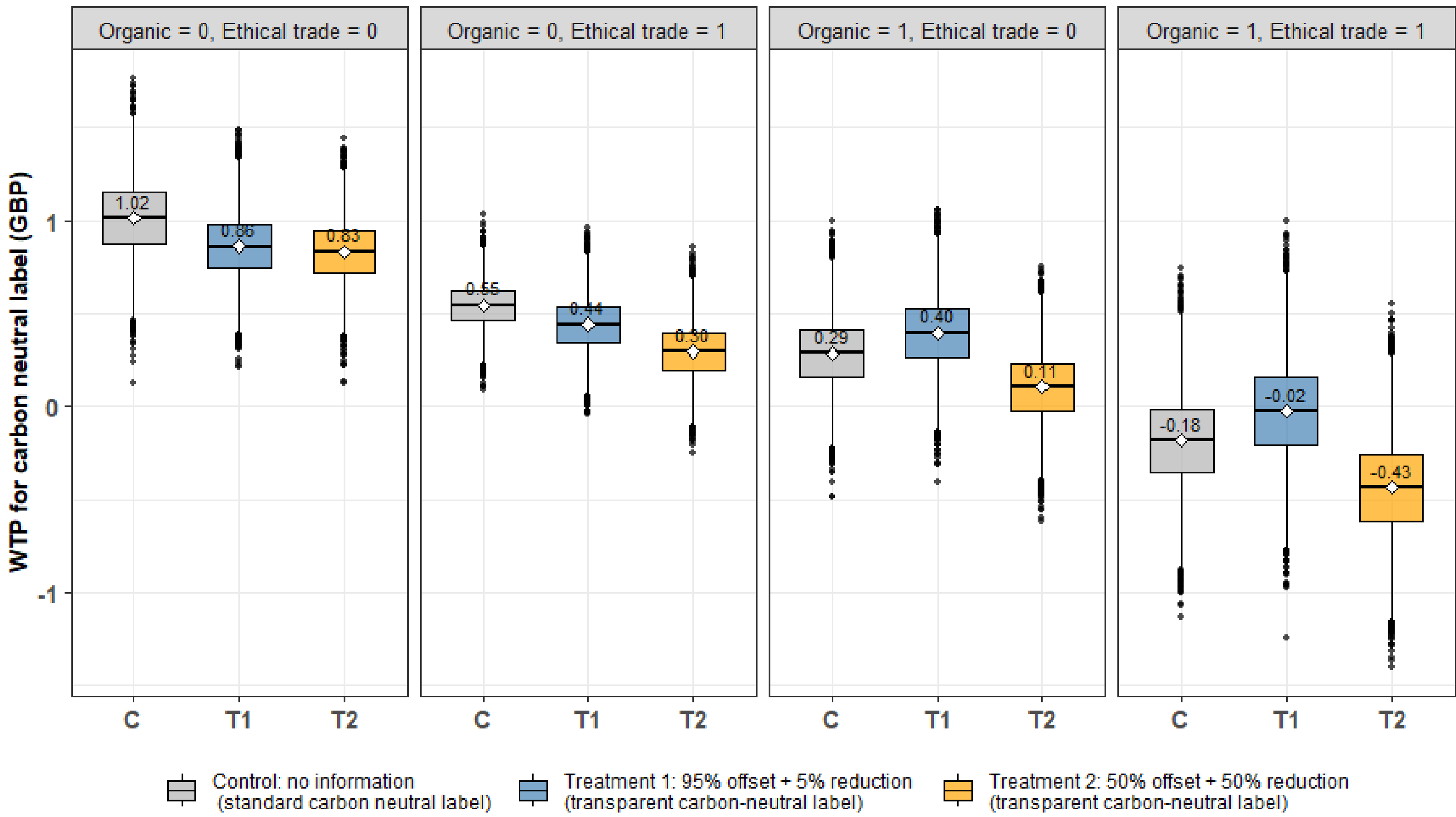
Pairwise comparisons (Holm-adjusted)

Comparison	Poe test	
Control vs. Treatment 1	0.40	($p = 0.80$)
Control vs. Treatment 2	0.03	($p = 0.15$)
Treatment 1 vs. Treatment 2	0.06	($p = 0.25$)

- Consumers are willing to pay a premium for carbon-neutral labels.
- No evidence that transparency increases WTP.
- No evidence of preference for CO₂ reductions over offsets.

Competing Labels

Organic and ethical-trade labels **crowd out** the marginal value of the carbon-neutral claim, but do not change the null effect of transparency.



Mechanisms

- 51% of participants** misunderstood offsetting, but WTP does not differ significantly between those who did and did not understand it.
- The **95/5 label** was rated as the most confusing (**34.07%**).
- Interaction effects for trust, confusion, concern about offsets, climate worry, guilt, and social approval were tested.
- Holm-adjusted Wald tests** do not show statistically significant pairwise differences.

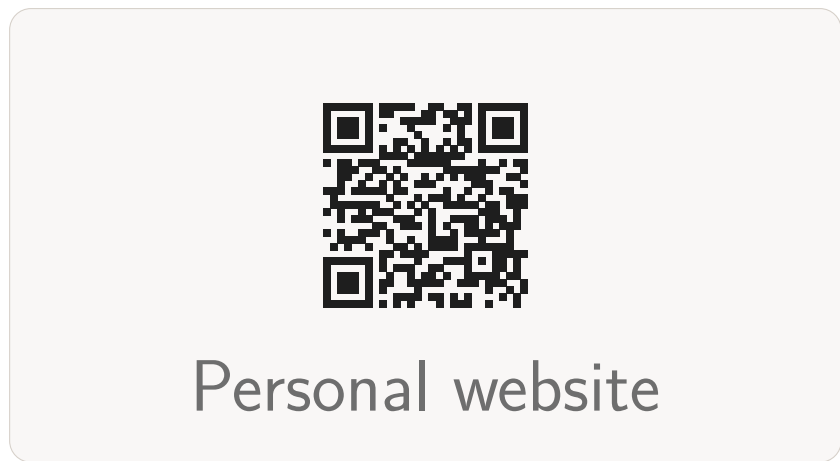
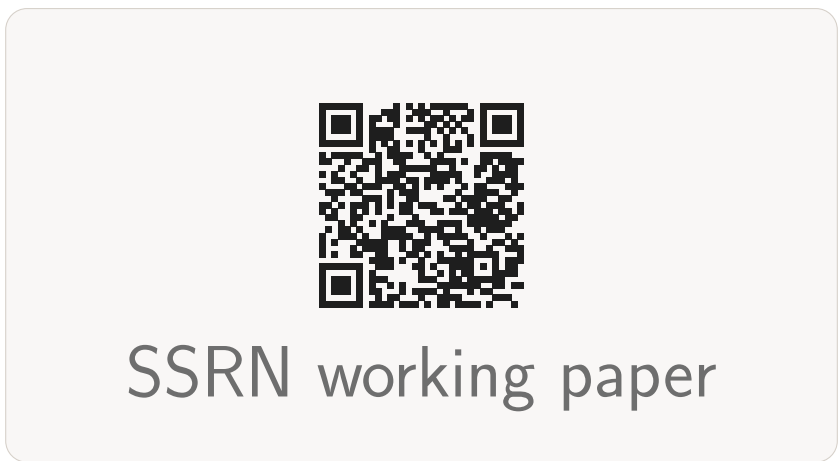
Robustness Tests

- Preference-space estimations: multinomial logit and mixed logit.
- Alternative sample restrictions: including protest responses; excluding speeders and failed attention checks.
- WTP-space estimations: multinomial logit, mixed logit, more Halton draws, and error components.
- Contingent valuation** as an additional check.

Conclusion

- Consumers are willing to pay a premium for carbon-neutral labels, but **transparency does not change WTP**.
- Reporting the exact **shares of offsetting and reduction** may not be sufficient on its own.
- Policy could balance **transparency** with **stronger regulation of labels**.

Resources & Contact



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