Pick your CARbon: User perceptions of Carbon Equivalencies When Selecting Rideshares

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Motivation

Here are 3 green car options, pick one:

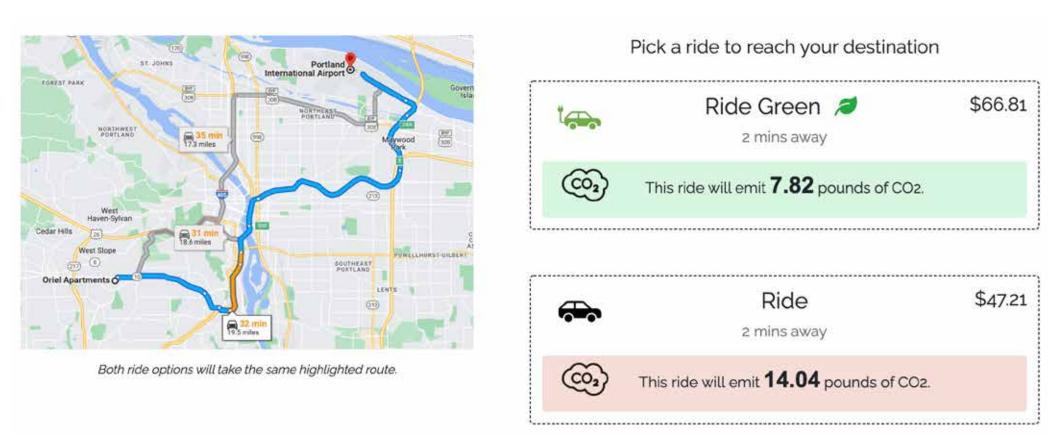
- Reduce: **97.9 Kilograms of CO**₂
- Rescue: **1.6 Trees**
- Save: 41.1 Liters of Gasoline

What is the right way to talk about carbon emissions?

We hypothesize that standard energy metrics are too scientific for consumers and may not be actionable.

Experiment

We asked people (n = 1000) to chose between simulated ride options with different CO₂ information.



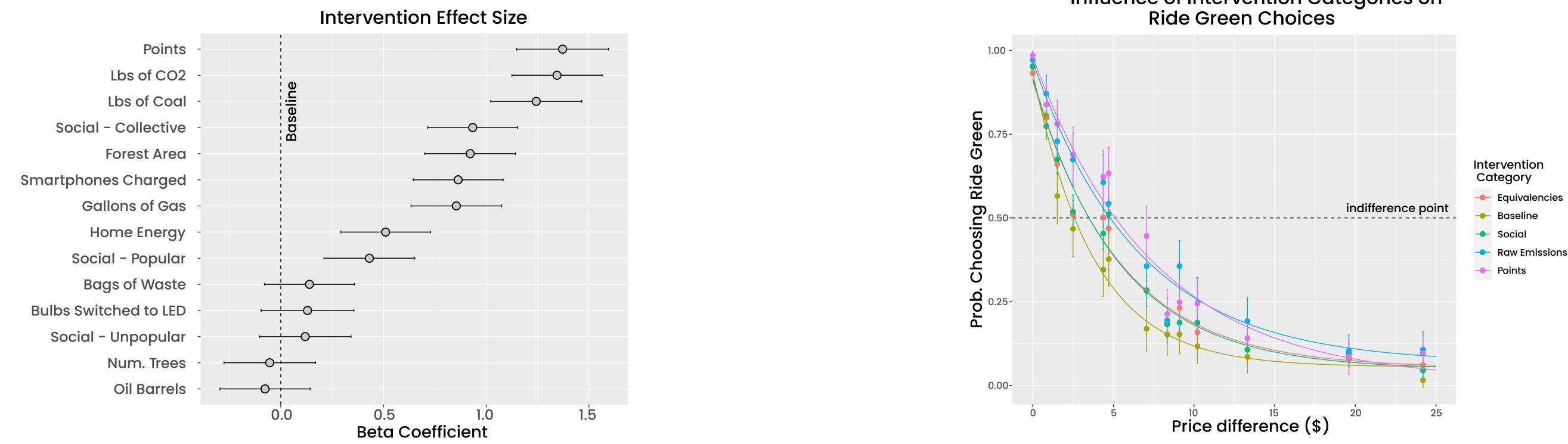
		0.444 Metric Torn - of Carbon Dioxide (CO ₂) equivalent This is equivalent to greenhouse gas emissions from:	
		0.095 gasoline-powered passenger vehicles driven for one year 🕥 👝 🚺 1,103 miles driven by an av	verage gaspline-powered passenger vehicle ③
		This is equivalent to CO ₂ emissions from:	
	rauvisones, including covid-19 testing and quarantine	50 gallons of gasoline consumed (?)	sumed ()
<u>Find o</u>	783 lb of CO ₂ correspond to:	482 pounds of coal burned (2)	h of gazaline 🗇 📾
×	 45440 Number of smartphones charged 0.07 	0.055 bames' energy use for one year ()	ne fer ene year
100.00	Number of US homes average electricity consumption for one year	0.002 railcars' worth of coal burned ③	
Flight	887.5 Miles driven by an average passenger vehicle	18.1 propane cylinders used for home barbeques ③	ints in one year 🗇
🐯 United ((UA) 783lb of CO ₂ ①	natural gas-fired power plants in one year ③ S4,052 number of smartpho	ones charged 🔿

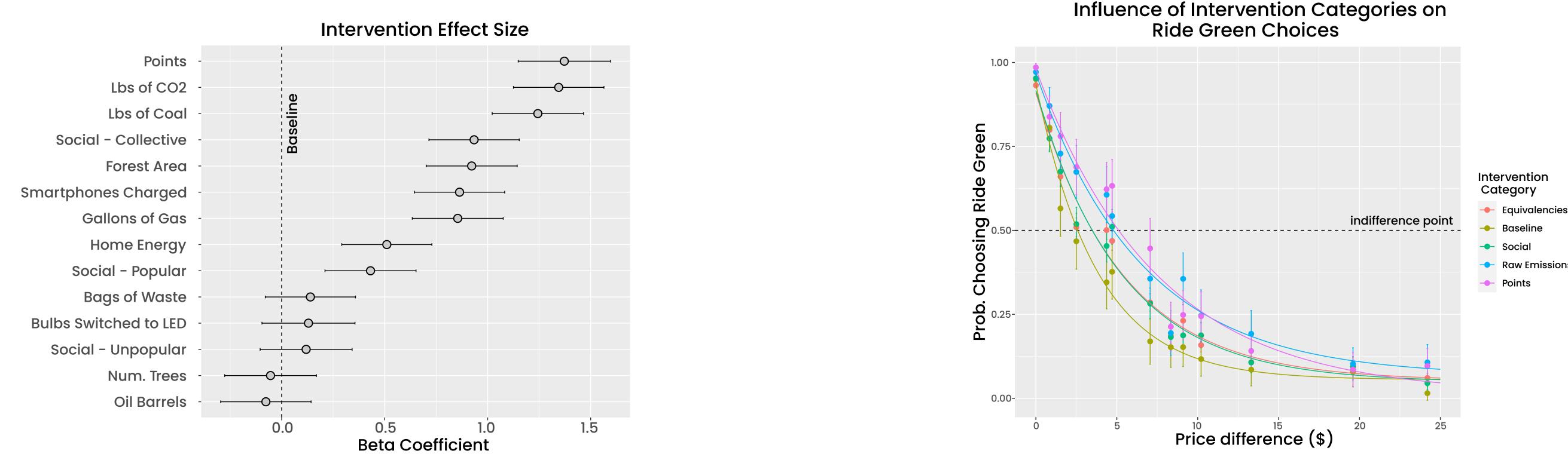


Results

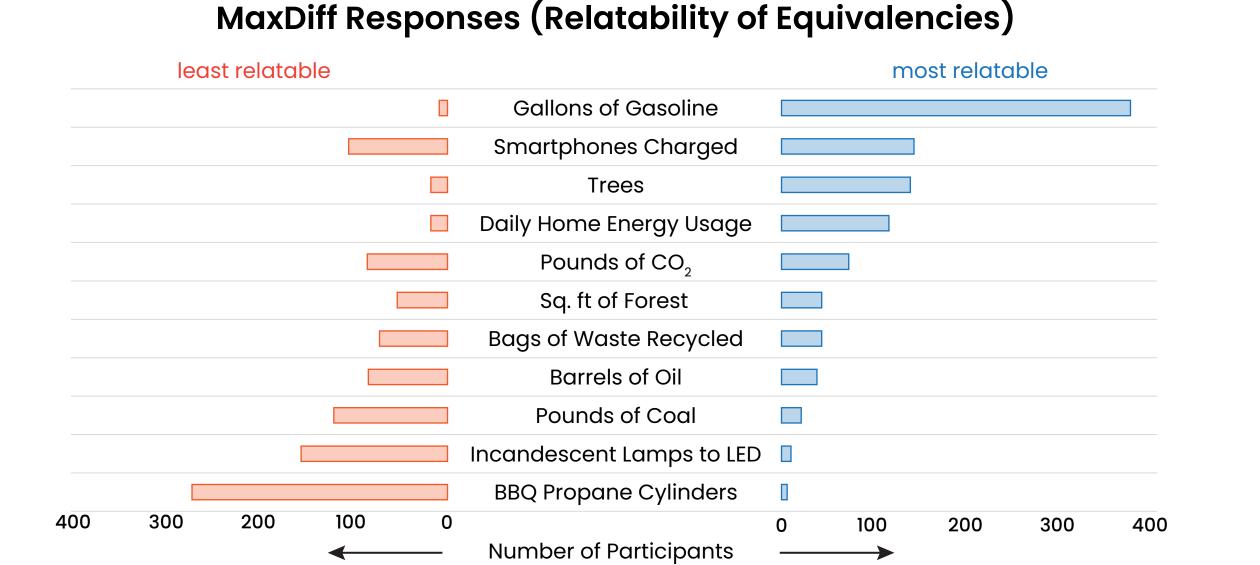
People's ride-share choices are influenced by the way carbon is presented.

All carbon interventions increased the likelihood that participants chose the "green" option.

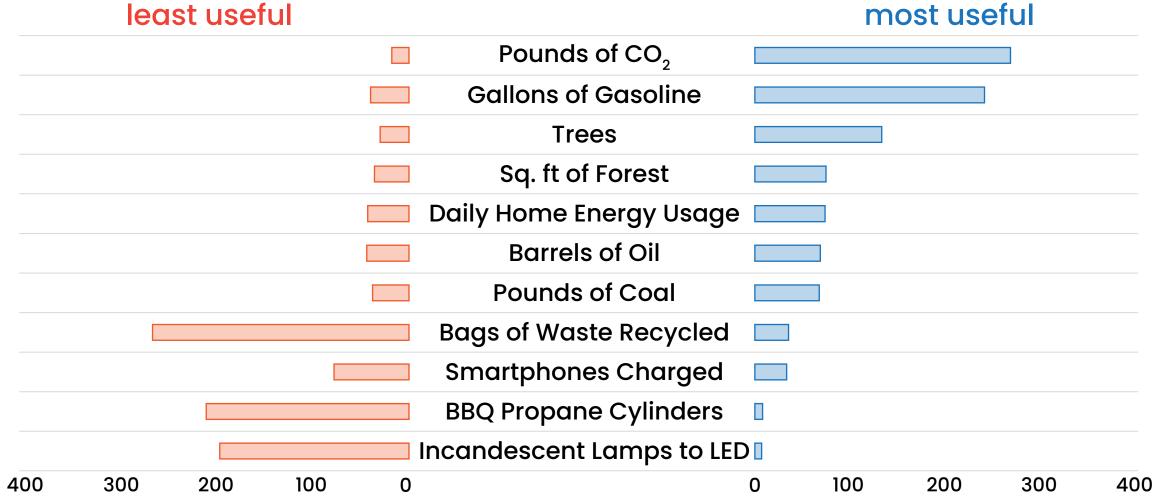




The equivalencies participants find most "relatable" or "useful" are not always effective.



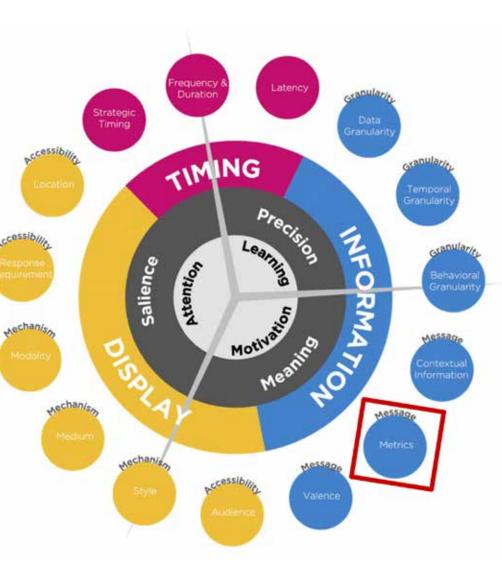
MaxDiff Responses (Usefulness of Equivalencies)



Number of Participants

Findings

 Raw CO2 emission numbers, when shown in comparison, are highly effective • Reward points were effective Interventions nudged people to make green choices •People were willing to pay more for the green choice Social interventions, in the form of collective impact, showed promise



Future Work

•Why were raw CO2 emission values effective? • Effect of CO2 emission targets? • Effect of contextual explanations? • Effect of valence in the messaging? • Effect of social factors? • Effect of temporal granularity?

References:

- David A. Shamma, Matthew L. Lee, Alexandre L. S. Filipowicz, Laurent Denoue, Kate Glazko, Kalani Murakami, and Kent Lyons. 2022. EV Life: A Counterfactual Dashboard Towards Reducing Carbon Emissions of Automotive Behaviors. In 27th International Conference on Intelligent User Interfaces (IUI '22 Companion). Association for Computing Machinery, New York, NY, USA, 46–49.
- EPA's GHG Equivalencies Calculator (22 equiviencies): https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
- Angela Sanguinetti, Kelsea Dombrovski, and Suhaila Sikand. "Information, timing, and display: A design-behavior framework for improving the effectiveness of eco-feedback." Energy Research & Social Science 39 (2018): 55-68.

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