Individual and Collective Action: Evidence from the Climate Movement*

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Abstract

Does encouraging individual action on large-scale societal problems like climate change undermine collective political engagement? Our time's "individualization" zeitgeist is often amplified by large corporations, and many worry that it crowds out support for systemic policy. We investigate through a randomized controlled trial embedded in Scandinavian administrative data, recruiting over 4,000 Swedes to use an advanced consumption-tracking app. The treatment arm adds a carbon footprint calculator—the paradigmatic personal agency technology first popularized by BP—with feedback, social comparisons, and injunctive norms. We link comprehensive measures of subjects' political lives from administrative data and surveys, including an obfuscated exit-poll-style survey fielded immediately after the 2024 European Parliament elections, with *complete*, revealed footprint measures through a new research infrastructure. Individualization of externalities causes a large, immediate reduction in consumption emissions that is concentrated among green-predisposition individuals and begins to fade after a few months. However, we find no evidence of political crowd-out. Instead, the treatment's personal-responsibility messaging crowds *in* collective action among particular (and increasingly influential) greens: those who reason deontologically. Unlike the consequentialists of social science textbooks, they evaluate actions based on their *means*. Deontologists are more likely to vote, vote for greener parties, support climate policy, name climate change as decisive to their vote, donate to climate causes, and sign petitions, when encouraged to take personal-life action on the cause. Our results are broadly consistent with activists' theory-of-change that personal and collective, political action reinforce each other, but not with researchers' warnings of an opposite-signed individualization-trap.

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1 Introduction

Individuals pursue their self-interest; companies maximize profits; and the state—informed and mandated by the democratic process—corrects market failures. This is often the starting point for economics and political science textbooks. Delineated societal roles reasonably reflect the organization of much of private and public life, and are thought to help deliver prosperous societies.

Yet these boundaries are beginning to erode. A stark example is climate change. States have largely failed to slow potentially catastrophic greenhouse gas emissions (IPCC, 2023). In contrast, a global majority of surveyed individuals now report self-regulating, consuming less or greener out of concern about climate change (Ipsos, 2021), while few vote for green parties. And in parallel many companies build green brands. They do so in part through wide-reaching media campaigns promoting conscientious consumption and personal responsibility for one's footprint (Supran & Oreskes, 2021); an example of corporations conspicuously emphasizing i(ndividual)-frame thinking (Chater & Loewenstein, 2023b). These different but interrelated role-blurring phenomena are often met with skepticism from researchers. Economists warn against focus shifted away from the state in the fight against climate change (Stiglitz et al., 2017; Chater & Loewenstein, 2023a). The premise underlying such warnings—that bottom-up mitigation efforts by individuals (or corporations) don't merely fail to add up; such ideas crowd out the s(ystemic)-frame government policies that *could* effectively reduce emissions (Nordhaus, 2019; Hahn et al., 2026)—might link back to textbooks. Quantitative social science stipulates consequentialist reasoning, and when actions are compared by their contribution to an end, doing more of one tends to imply doing less of another. Many activists instead argue that "personal action and collective, political action are self-reinforcing" (Sierra Club, 2019).[1]

In this paper we ask, first, if individuals engage more or less in a cause *politically* if encouraged to do so *personally*, through consumption choices; second, how any such political crowd-out (or -in) compares to direct effects on consumption; and finally, whose interests (if anyone's) emphasizing individual action appears to serve. We investigate in the climate case and embed a large randomized trial within Sweden's administrative data. The treatment is a paradigmatic personal agency technology, originally popularized by BP (Brulle & Werthman, 2021): a climate footprint app encouraging conscientious consumption. We combine individual-level exposure with comprehensive measures of the political and private behaviors through which subjects can potentially influence the cause. A new

[1] A vocal and equally environmentally-ambitious faction echo traditional social science in their strategies and oppose "individualization" (for debate, see e.g. Hackel & Sparkman, 2018; Williamson et al., 2018; Mann, 2019; Mark, 2019; Michaelson, 2019; Kaufman, 2020; Alter, 2021; McFall-Johnsen, 2021; Solnit, 2021).

research infrastructure we set up makes this possible.

Emphasizing personal action to help combat large-scale, societal challenges could crowd out political engagement and collective action through different, plausible pathways, but they tend to pre-suppose consequentialist decision-making.[2] In our conceptual framework, consequentialists' attention to "ends" in effect makes private lifestyle choices and political engagement substitutes in the production of environmental quality. Yet, recent empirical evidence has made clear that "thinking like an economist" is relatively uncommon (Bartels, 2008; Conway & Gawronski, 2013; Awad et al., 2018; Almås et al., 2020; Stantcheva, 2026). Many real-world decisions are taken based on evaluations of their means (Bénabou et al., 2024; Ellingsen & Mohlin, 2026). And people who reason deontologically and try to follow perceived moral rules are unlikely to let devolved responsibility for externalities reduce doing-their-part through the political channels of the traditional social contract. For them, one might instead expect possible crowd-*in* of political engagement and its downstream regulatory consequences.[3] In our stylized framework, deontologists' benefits are supermodular in the two activities, and our pre-registered hypotheses predict reductions in individual emissions but the possibility for both political crowd-out and crowd-in, depending on the individual's (reasoning) type. The net impact of increasingly loud calls for individual climate action will then filter through population heterogeneity in both reasoning itself and its implications for private consumption and (potentially countervailing) political engagement responses.

We investigate in Sweden, where widespread climate concern coexists with modest political action. Ninety-two percent of Swedes view climate change as a serious problem (European Commission, 2025), yet national and international commitments aren't met (Swedish Climate Policy Council, 2025). Deontological arguments often take center-stage in the home country of Greta Thunberg, concepts like "flight shame" (*flygskam*), and many companies and activist organizations encouraging individual climate action (see Section 2). The research infrastructure, data linking, and privacy protections we develop would likely also prove infeasible outside of Scandinavia.

We invited about 180,000 Swedes to use the app *Konsumtionskollen* ("The Consump-

[2]This could for example happen through so-called moral licensing or -accounting (Monin & Miller, 2001; Sachdeva et al., 2009; Bénabou & Tirole, 2011; Mullen & Monin, 2016; Knook et al., 2022); limited attention or other psychological channels that more directly cause activity substitution (Werfel, 2017; Gabaix, 2019; Hagmann et al., 2019; Nafziger, 2020; Altmann et al., 2021); as a result of media space crowd-out (Eisensee & Strömberg, 2007; Beattie, 2020; Chater & Loewenstein, 2023a); and/or through a household production framework for green outcomes (Ek, 2018; Chan, 2024).

[3]Crowd-in could also come about through different specific channels, such as affirmation of values or a desire for moral consistency (Bénabou & Tirole, 2011; van der Werff et al., 2013; Mullen & Monin, 2016; Comin & Rode, 2023); perceived establishment or reinforcement of social norms (Allcott, 2011; Nyborg, 2018); and/or through signaling channels (Bénabou & Tirole, 2006; Ellingsen & Johannesson, 2008).

tion Tracker") and participate in research in May 2024. This was done through the digital mailboxes used for official communication in Sweden, and take-up was higher than expected—over 4,000 participants in the final sample—so that the experiment is high-powered.[4] The app was developed by climate researchers and tracks all spending through a connection to subjects' bank accounts. The treatment is the regular, environmentally-framed version, with social comparisons, injunctive norms, personalized suggestions, goal-setting, and feedback on one's emissions. The pared down, spending-information-only version the control group receives is not environmentally framed.

A detailed pre-analysis plan guides the analysis. Our first measure of subjects' political lives is voting in EU Parliament elections, which tend to have far-reaching climate policy consequences. Only 53% of eligible Swedes voted in the 2024 elections we focus on, compared to 84.9% in the 2026 national elections. We combine vote-cast records with exit-poll-style measures of party choice (ranked by "greenness") and policy preferences, and endline survey measures of social movement activity and incentivized climate actions. The obfuscated election survey was conducted with the Swedish National Election Studies Program—the country's premier election pollster—immediately after the election.

Do large emitters like BP and Exxon Mobil, who spend millions to "individualize" climate responsibility (Brulle & Werthman, 2021; Supran & Oreskes, 2021), appear to gain from such efforts? Does the climate movement? A full account of the consequences and incidence includes political impacts, but also any *direct* effects on spending and emissions. Complete footprint measures are needed.[5] In essentially cash-free Sweden, the app's link to the user's bank statement provides a full view of spending. Register data report energy source and use—the emissions component examined in most existing research (see e.g. Lyubich, 2025)—but also, for example, type of housing and car (if any). Together, the registers and app make it possible to account for user-level heterogeneity in transactions' carbon intensity. Existing methods that, like ours, e.g. capture different emissions from expenditure at a fueling station for those who drive an electric vs. a gas car typically cover only about half of individuals' footprints (Song et al., 2019; Berland & Leroutier, 2025).[6]

[4]Our take-up rate is between 2 and 3%, which is low in absolute terms but unusually high for digital enrollment, especially given the app's intrusiveness and low nominal incentive to participate (about 3 USD). Intrusiveness is often a necessary feature of targeted behavioral policies, and the take-up rate was higher than our power calculations for consumer outcomes assumed. Ex ante power calculations were not feasible for political outcomes, but our sample sizes are larger than those in prior work examining similar outcomes (see e.g. Jha & Shayo, 2019; Cantoni et al., 2019; Bursztyn et al., 2021), and also substantially larger than Haaland et al. (2023)'s recommendation for information experiments.

[5]One reason is that interventions targeting particular life choices (such as water consumption) have been shown to affect behavior in *other* areas (such as energy consumption) (Bonan et al., 2021; Jessoe et al., 2021).

[6]They do so with detailed consumer surveys that distinguish quantities and prices (see Berland & Leroutier (2025) for a compelling example). This comes at the cost of moderate breadth and reliance on recall.

In the first part of our empirical analysis we show that some individuals sharply decrease consumption when encouraged to take individual climate action. Treated subjects reduce emissions by 3.6% in the first quarter. This substantial response is driven by a pre-specified subsample of "green" individuals who reduce emissions by 7%.[7] Spending and emissions appear to fall across most broad consumption categories (greens for example spend less on clothing)[8], but we find little evidence of switching from high- to low-emitting expenditure. The first-quarter response fades relatively quickly: in the second quarter the (now imprecise) point estimate suggests 2% lower emissions among greens. Aggregating across the full seven-month treatment period yields emissions reductions that are large in absolute terms—much bigger than comparable information interventions (see e.g. Allcott, 2011; Andor et al., 2020), and totaling about 0.9% of Sweden's total annual emissions if extrapolated to the full population (see Appendix E.3)—but not statistically significant. A high-intensity personal agency treatment like the one we analyze thus directly reduces emissions substantially in the first few months because greens adjust their lifestyles, but consumption then backslides.

In the second part of our empirical analysis we analyze how individualization in turn affects political engagement in the climate cause, and find no evidence of crowd-out. Effects on our measures of political participation and action are small in magnitude and not statistically significant in the full sample, as well as among greens and other subsamples.[9] There is, however, an important exception: in line with our hypotheses and the conceptual framework, we find *crowd-in* of collective action through politics and environmental policy preferences among green deontologists.[10] When encouraged to act personally through consumption choices, they are more likely to vote, vote for greener parties, support climate policy more, cite climate change as a key factor in their voting choice, donate more to a climate cause, and are more likely to sign a petition for climate action.[11] In short, they appear to adopt or extend a broad moral duty to address climate change that increases their political engagement as well.

Overall, our experimental evidence indicates less reason to worry that consumers internalizing emissions externalities—sometimes prodded by corporations or activist

[7] The green sample was pre-defined using a set of survey questions on climate concern, desire to live more sustainably, and pro-environmental attitudes. They comprise about one-third of our sample.

[8] $p = 0.005$; $q = 0.057$ with adjustment for multiple hypothesis testing

[9] We focus the political engagement analysis and remainder of the paper primarily on the green sample, given the consumption findings and in line with our pre-analysis plan.

[10] We measure deontological reasoning in two ways, but primarily the standard-approach trolley problem.

[11] The relationship between the exit poll survey and our treatment was carefully obfuscated. Our version matched very closely with the look, feel, and content of standard surveys from the Swedish National Election Studies Program (SNES). The survey also included a battery of other topics besides climate change (e.g., attitudes toward the EU, refugees, food, etc.). See Appendix D.4.

organizations—further erodes political engagement and states' thus-far-limited attempts to slow emissions than is often argued. At least in contexts like Sweden, personal agency focus likely benefits the climate movement[12], with the magnitude of the benefits depending on the relative prevalence of different forms of reasoning in the population. Whether it in-sum benefits society at large is an important question for further research.[13]

This paper provides a comprehensive, direct test of individual/collective action crowd-out.[14] This ties our work, first, to a broad social science literature on engagement in politics, policy, and collective action. The bodies of work studying top-down mobilization of political *behavior* and policy-support on the one hand (see e.g. Green et al., 2013; Drews & Van den Bergh, 2016; Green & Gerber, 2019; Dechezleprêtre et al., 2025), and the more bottom-up, organic processes that shape political *preferences* and identities on the other (see e.g. DellaVigna & Kaplan, 2007; Jha & Shayo, 2019; Kuziemko et al., 2026), are both large. They are also largely disjoint (Green & Schwam-Baird, 2016; Han et al., 2024). We study a readily-available and top-down, mobilizing stimulus that both (some) climate activists and corporate interests can and do make use of at-scale. Our findings make clear that such tools can affect not only turn-out, but also "deep" political engagement outcomes thought to evolve more slowly (party choice, willingness-to-pay for climate support, and so on). This in turn ties this paper to a fast-growing new stream of work on social movements, with particular focus on technological factors and social dynamics.[15] We show how one's perceived, *personal* agency itself affects engagement in the cause through collective channels. The prospect of political crowd-out and its downstream consequences is arguably among the most debated but least evidenced topics in the science of prosocial behavior. Our findings may plausibly extend beyond the climate context (see e.g. Buchholz & Sandler, 2021).

Our results also help empirically ground the broader debate and research on policy targeting individuals vs. "systems". Beliefs and ideas influence policy and welfare (Benabou,

[12]Many of our subgroup-specific findings echo ones from Dechezleprêtre et al. (2025)'s multi-country survey experiments. We cross-validate self-reported voting with individual-level administrative voting records.

[13]Large changes in consumption may e.g. affect economic growth, which would matter for social welfare.

[14]Earlier empirical work offers partial tests using lab-like, stylized primes or vignettes and measuring self-reported outcomes soon after treatment (Werfel, 2017; Hagmann et al., 2019; Knook et al., 2022). Heeb et al. (2026) instead present a climate-friendly fund investment opportunity before a climate referendum, finding no crowd-out of political support. Nie et al. (2026) study a plastic conservation campaign and find crowd-in of support for stricter plastic policy. We attempt to experimentally shift an individual's general, perceived ability to reduce their emissions through personal life choices; to do so "naturally"; to comprehensively measure the political and private behaviors and attitudes relevant to the cause; and to ensure high-intensity in the treatment (since a clear "first-stage" shift in private behavior helps interpret political null results).

[15]See McClendon (2014); Cantoni et al. (2019); Enikolopov et al. (2020); González (2020); Bursztyn et al. (2021); Dippel & Heblich (2021); Hager et al. (2022); Cagé et al. (2023); Boudreau et al. (2025).

2007; Cantoni et al., 2017; Alsan & Neberai, 2026; Ash et al., 2026). The belief that individuals are in control of their own fates is thought to be especially consequential. It might engender choices—e.g., policies and parties to support at the ballot box—that themselves reduce *governments*' effectiveness, leading to self-fulfilling prophecy dynamics (Benabou & Tirole, 2006). This led Maniates (2001), Chater & Loewenstein (2023a), and many others to worry about the fast spread of i-frame zeitgeist, policy efforts, and organizations the past several decades.[16] We build, first, on Bénabou & Tirole (2010), Bénabou et al. (2024), Ellingsen & Mohlin (2026), and Stantcheva (2026) to take seriously the possible broader significance of moral reasoning for economic decisions and the delineated-roles view of society itself being contested.[17] Our crowd-in findings imply that deontology's role and influence might continue to grow in the climate case[18], and that corporations' curious focus on individuals' climate footprints either has other motivations (such as dynamic consumer/producer complementarities (Aghion et al., 2023; Besley & Persson, 2023)); that it influences regulation outside of democratic processes; or that it simply is ineffective strategy (DellaVigna & Gentzkow, 2010).

Finally, we provide an assessment of the extent to which and how individuals change their lifestyles and consumption when helped and encouraged to do so to reduce emissions—an important input into almost all mitigation policy design (Creutzig et al., 2023).[19] This is because we directly measure subjects' *full* carbon footprints and expose them to a high-intensity, sustained form of information incentives from trusted sources. The nuanced malleability we detect is the final input into our conclusion: emphasizing personal responsibility and agency appears to markedly benefit climate change mitigation, but unless crowd-in of political engagement from deontological greens has substantial downstream (e.g. regulatory) consequences, the benefits may still be one-off rather than compounding.

[16] Chater & Loewenstein (2023a) especially worried about the focus on "nudges" following Thaler & Sunstein (2008)'s influential book and companies promoting related ideas, in part because nudges looked less effective when Milkman et al. (2021), DellaVigna & Linos (2022), Maier et al. (2022), and Mertens et al. (2022) reanalyzed the evidence, and because beliefs are often incorrect (see e.g. Stantcheva, 2020).

[17] Consequentialism vs. deontology is moral philosophy's most fundamental distinction (Rawls, 1971). Economists have naturally focused more on closer-to-home moral concepts such as scope/whose-interests-count (e.g. Enke, 2020) and distributive principles (e.g. Cappelen et al., 2007).

[18] In addition to the influence over policy our findings imply, there is also evidence in various surveys, and from comparing early to later studies, that deontological endorsement of climate action duty is growing more prevalent (see Appendix G.1). If this reflects a link from how societal challenges are addressed to the prevalence of deontological thinking, then our findings may suggest "self-correcting" dynamics, as more and greener votes from (green) deontologists imply *increased* state regulatory efforts downstream. Of course, consequentialists may also see reason to self-regulate, for example due to states' inaction.

[19] Our feedback and facilitation incentives build on wide-ranging research and policy efforts to influence decisions through behavioral interventions (see e.g. Madrian & Shea, 2001; Thaler & Benartzi, 2004; Carroll et al., 2009; Allcott, 2011; Ferraro & Price, 2013; Banerjee et al., 2020; Dai et al., 2021). Rodemeier & Semken (2026) survey research on behavioral environmental economics.

2 Background

2.1 Climate change and mitigation efforts

Greenhouse gas emissions from human activities have "unequivocally caused global warming" (IPCC, 2023).[20] Global surface temperature has already reached 1.1°C above pre-industrial levels, resulting in wide-ranging climate change impacts including weather extremes, shifting precipitation patterns, ecosystems and species loss, threats to food and water security, and adverse consequences for human health.

The Paris Agreement of 2015 seeks to hold increases in global temperature below 2°C. Signatories are to implement policies to meet nationally determined greenhouse gas emission targets. Yet despite near-universal ratification or accession to the treaty, almost all states have thus far failed to follow through in their regulations and policy measures. The current trajectory is projected to result in 2.8–3.2°C warming by the end of the century, raising the risk of climate tipping points and severe, irreversible damages (IPCC, 2023; UNEP, 2025).

Climate action by private actors—eco-consumerism and self-initiated conservation by individuals and households, corporations, and so on—has meanwhile been growing (Bénabou & Tirole, 2010; Kotchen, 2013; Aghion et al., 2023; Kaufmann et al., 2024).

2.2 Study setting: Sweden

State failures may both contribute to and in turn be influenced by such individualization of climate action. Sweden provides a suitable setting for investigating these relationships.

First, widespread climate concern rarely translates into *political* action in Sweden, as elsewhere. The Green Party's vote share has never surpassed 7.5% in national elections; the government has rolled back climate measures as anger over high energy prices grew; and only eight percent of Swedes list climate change as their most important political issue (Sveriges Radio, 2026). The country's often-youth-led climate movement has continued to demand stronger political action, as famously exemplified by Greta Thunberg's school strikes that began in Stockholm in 2018 (Radio Sweden, 2026; WWF Sweden, 2023).

Second, *individualized* climate action is common and highly visible in Sweden. The proportion of Swedes who reason deontologically is comparable to the global average, but higher than in many other Western countries (see Appendix G.2). Eighty-five percent

[20] We use the terms "carbon emissions" and "greenhouse gas emissions" interchangeably. Both refer to all greenhouse gases, including carbon dioxide, methane, and nitrous oxide. These different substances are aggregated into carbon dioxide equivalents (CO_2e) using their 100-year global warming potentials.

of Swedes report voluntarily reducing household energy use and 58% eating less meat to reduce their climate impact (Naturvårdsverket, 2024). Personal climate action is often framed in moral terms (e.g., "flight shame") and promoted both by corporations and environmental organizations.[21] A high-powered test of whether and how private climate behavior affects political behavior appears possible in this context.

Finally, Sweden's digital infrastructure enables treatment at scale; tracking individual level outcomes; and linking forms of data that can rarely be looked at together. Ninety-five percent of Swedish adults use BankID, an electronic identification system that is used to log into banks, government agencies, and health services (Internetstiftelsen, 2025). Participants can securely authorize access to their bank transactions for our study, giving direct insights into actual consumption outcomes rather than self-reported behavior. Similarly, 76% of adults use a digital mailbox, verified through BankID, to receive official communications from public agencies, employers, and businesses (Internetstiftelsen, 2025); this makes large-scale enrollment efforts possible. Sweden also maintains a wide range of administrative registers, all linked through a personal identity number, which can additionally be used to target surveys.

3 Study Design

Beginning to understand the last few decades' individualization of climate responsibility "in the wild"—and impacts on mitigation action through traditional, political channels that the consequences depend on—requires devolvement at scale; a research infrastructure that can comprehensively measure and link individuals' reasoning, private actions, and political outcomes; and a technology suitably linked to the zeitgeist of individualization. Figure I overviews our experiment and data collection.

3.1 Sampling and recruitment

We contacted potential participants in May 2024 through their official digital mailbox, inviting them to make use of and share consumption data with a mobile app (Konsumtionskollen, or "The Consumption Tracker") that was designed specifically for this study.

[21] For example, a Swedish fast-food chain framed purchasing its "climate-positive" burgers as a virtuous act, casting its consumers as "climate heroes" (Christiansen et al., 2023). The Swedish Society for Nature Conservation links consumption restraint to responsibilities towards others and future generations (Naturskyddsföreningen, n.d.), while WWF Sweden offers a personal carbon footprint calculator (WWF Sweden, n.d.).

In the app, subjects used their BankID to grant access to transaction and other individual data. They received a small reward for participation.[22]

We first ran pilots to test recruitment protocols and app functionality. Take-up rates were somewhat higher than expected—2-3%. Based on the pilots and power calculations for ∼1,400 users, we invited ∼180,000 individual to participate. We targeted Swedish adults in single-person households.[23] We also oversampled demographics and geographies that we believed would be responsive to a technology encouraging personal climate action: 18-39 year-olds from precincts with a comparatively large share of green party voters in the previous EU election. The final sample has over 4,000 participants.

3.2 Data

We combine data from three main sources: the Konsumtionskollen app; three surveys (baseline, election, and endline); and administrative data from government registers. Outcome variables are summarized in Appendix Table C.1, and a full codebook is in Appendix C.

The baseline survey took place concurrently with recruitment in May 2024. It included standard questions from European and Swedish public opinion surveys (Eurobarometer and SOM, respectively) along with measures of identity and values (Gneezy et al., 2012; van der Werff et al., 2013; Cornelissen et al., 2013; Garvey & Bolton, 2017). The election survey was fielded on June 10, 2024, the day after the European Parliament elections. It included standard exit-poll-style questions and was administered in partnership with SNES.[24] The link between the election survey and other parts of the study was carefully obfuscated (see Section 4). The endline survey was circulated in December 2024. This survey polled participants again on items from the election survey, and presented two revealed preference elicitations for climate action (Dechezleprêtre et al., 2025). Summary statistics are presented in Appendix C.7 and full surveys in Appendix H.

[22] This was an electronic lottery ticket worth 30 SEK after sign-up and a second lottery ticket after completion of the endline survey. Subjects were also informed that Konsumtionskollen was developed by *Svalna AB*, and that the study would link their consumption data with register data and survey responses.

[23] Avoiding households with multiple adults who share expenses helps ensure better accuracy for consumption measures and feedback.

[24] Established in 1954, SNES is a leading institution for studies of politics, public opinion, and voting behavior. They have conducted regular surveys in connection with European Parliament elections since 1995, and they are recognizable and well-regarded by the Swedish public (Swedish National Election Studies Program, 2026).

Political outcomes. The main political outcomes are: (a) voting in the 2024 EU Parliament elections, (b) greenness of the party voted for,[25] (c) importance of climate change in voting choice, (d) support for climate policies, (e) signing a climate petition, and (f) donating to a climate cause.[26] These outcomes are measured from responses in the election and endline surveys. The voting outcome is cross-validated with official vote-cast records from government registers.[27]

Consumption outcomes. The primary consumption outcomes are weekly carbon footprint (kg CO_2e), expenditures (SEK), and carbon intensity (kg CO_2e/1000 SEK), which we track from up to 60 months preceding app installation in May 2024, to the end of the study period in December 2024. The Konsumtionskollen app collects detailed bank transaction data. Each transaction states the retailer and amount. The app categorizes transactions into 65 categories (e.g., groceries, transport, electronics, rent) and calculates carbon footprints for each by combining expenditure amounts with carbon intensities calculated by Statistics Sweden—using multi-regional input-output analysis to account for emissions along the entire supply chain—as well as data from official government registers and individual user information. There are four parent categories: food, housing, transportation, and miscellaneous.

Moral reasoning. We elicit moral reasoning in our baseline survey following standard practice: a trolley dilemma (see Appendix C). Subjects are classified as consequentialists if they are willing to divert the trolley and as deontologists if they are not (Cornelissen et al., 2013). In our sample, 86% are consequentialists while 14% are deontologists. This measure of deontological reasoning is likely conservative (see Awad et al., 2018; Bénabou et al., 2024), but informative.[28] Note also that trolley dilemma responses do not proxy for other characteristics that predict differential treatment effects on political behaviors:

[25] We calculate a green score for each party based on subjects' survey responses about them in the SNES survey. More details on this pre-specified procedure are available in Appendix C. There was strong consensus across subjects on the ratings and rankings across parties (Appendix Figure C.1).

[26] Items (d), (e), and (f) follow closely from Dechezleprêtre et al. (2025). Additional outcomes were described in the PAP but are omitted, as described in Appendix D.6.

[27] We use the official voting records in the outcome variable, but self-reports almost always agree.

[28] To test this, we elicit consumers' concern for consequences specifically related to individual climate action at endline. Following Kaufmann et al. (2024), we ask about consumers' valuation of a CO2e reduction when it does versus when it does not reduce *aggregate* emissions. We find suggestive evidence that deontologists in our sample of green consumers (defined below) are less concerned about the effects on aggregate emissions than consequentialists (see Appendix Figure D.2). This is expected, given their relative attention to means vs. ends. It also suggests that the relevance of our deontology measure for climate action depends on underlying green preferences, consistent with Bénabou et al. (2024)'s finding that moral reasoning differs across contexts.

in both the full sample and among green individuals, there is near-perfect balance in baseline characteristics and other attitudes between deontologists and consequentialists (Appendix Table D.4). This is somewhat surprising and facilitates interpretation.

Green individuals. Our pre-analysis plan anticipated stronger treatment responses among those with pro-environmental orientation.[29] This "green" subsample comprises individuals whose baseline survey responses indicated ≥ 7 (out of 10) for "Considers climate change a problem", ≥ 5 (out of 7) for "Pro-environmental self-identity", and ≥ 5 (out of 7) for "Wish to live more sustainably". They constitute 33% of our overall sample.

Register data. The app's carbon footprint calculations and suggested ways to decrease emissions make use of register data, e.g. on home heating source. Further, we use official vote-cast records from the Swedish Election Authority to cross-validate individuals' reported voting. We also use sociodemographic and household variables (e.g., gender, age, location of residence, dwelling type, household composition, income, education, car ownership) from the Total Population Register (RTB), the Income and Taxation Register (IoT), the Employment Register (Sreg), and the Swedish Register of Education (UReg). Finally, we use administrative records for data quality controls, as described below.

Data linking and contractors. We worked with multiple contractors for recruitment, survey dissemination, and data handling. We link individual data across sources while maintaining strict, bespoke protocols to protect subjects' privacy, as described in Appendix B.4.[30]

Data quality and filtering. We run a battery of checks and filters to ensure data quality. We provide a brief overview here and full details in Appendix B. We verify complete coverage for consumption data by comparing transaction records to (a) official administrative records of income and household composition and (b) external expenditure benchmarks from SCB's 2021 Household Expenditure Survey. We also check for temporal and categorical coverage in consumption data.[31]

[29] This was in part because prior work has shown that green consumers are more responsive to information treatments (Costa & Kahn, 2013; Al-Ubaydli et al., 2023).

[30] We linked transaction and footprint data from Svalna's app with surveys commissioned from Enkätfabriken by SNES and the research team and administrative records from government agencies. Linkage used pseudonymous participant identifiers; a separate contractor, KGM, held the identity-linkage key (Appendix B.4). Svalna AB supported implementation and supplied app data but had no role in, or control over, the analysis or interpretation of results.

[31] Participants are excluded if their transaction history does not cover the required pre-treatment window, if spending is recorded in five or fewer consumption categories per month on average, or if average food

We follow best practices in survey design and data (e.g. Stantcheva, 2023). We included questions that tag inattention or inconsistency; asked for careful and honest answers; and notified participants that responses must pass automated quality checks to be usable.

3.3 Treatment

Participants were randomized into treatment and control groups within the app. The two groups are balanced, as shown in Appendix Figures C.2 and C.3.

The treatment encourages individual climate action through personalized information on the emissions associated with one's lifestyle, suggested actions, framing to boost self-efficacy (Semken, 2025), injunctive norms and social comparisons, and moral appeals from the IPCC (such as their "everyone must do their part" statement).

The treatment group's version of the app is similar to *Svalna AB*'s publicly available carbon footprinting app.[32] The detail, precision, and accuracy of its footprint measurement far surpass standard online—and to our knowledge all other—carbon calculators (see Andersson, 2020): it calculates a "revealed" footprint measure verified through bank transactions; it estimates emissions from multiple greenhouse gases (carbon dioxide as well methane and nitrous oxide) using rigorous accounting protocols; and it accounts for user-level heterogeneity in transactions' carbon intensity.[33]

The app encourages users to consume less or greener and provides specific suggestions on how to do so. Users can see their carbon footprints either aggregated or broken down into different consumption categories, or specified for individual transactions. They can set personal reduction targets, and compare their emissions with other people who are similar to themselves. Users also receive a monthly email report similar to the home energy reports used in many prior studies (e.g. Allcott, 2011; Allcott & Kessler, 2019; Andor et al., 2020). This helps increase and equalize treatment intensity regardless of how much participants use the app itself. The monthly reports contain a summary of the previous month's emissions, norm-based messages on how to reduce the footprint, and a prompt to open the app.

and transport spending is below 500 SEK per month.

[32] Figure II presents screenshots from the app for reference. Appendix A.1 provides further description and screenshots from the onboarding process, which reinforced personal agency and self-efficacy.

[33] For instance, dietary habits may affect the carbon intensity of food and beverage consumption. When on-boarding in the app, users answer questions about their diets, exercise, food waste, and the price class in which they typically purchase foods, which helps Svalna produce a tailored carbon intensity measure for each user. Similarly, Svalna adjusts heating footprint estimates based on user-entered data about heating sources, and carbon intensity per SEK estimates are updated dynamically to account for monthly energy price changes. Full details are provided in Andersson (2020). A more detailed description of the Svalna app is provided in Appendix A.

The control version of the app has a similar look-and-feel as the treatment group's version (see Appendix Figure A.5). It processes bank transactions in the same manner, but presents information to users through a neutral lens of personal spending and finance; it does not bring attention to environmental issues or provide any messaging designed to induce individual behavioral change. Control participants also receive neutrally framed monthly email reports on personal spending. The control app thus helps isolate two distinct channels through which the treatment might influence behavior: (1) information and feedback on general consumption and spending activities (both groups), and (2) personal action for reducing carbon emissions encouragement (only the treatment group).[34]

4 Empirical Analysis

Our empirical analysis follows a detailed pre-analysis plan.[35] We estimate intention-to-treat effects on consumption and lifestyle choices using versions of the regression:

$$Y_{it} = \tau T_{it} + \theta \bar{Y}_{i,PRE} + \delta_t + \varepsilon_{it}, \tag{1}$$

where Y_{it} is the consumption outcome of individual i at time t; T_{it} is a treatment indicator; $\bar{Y}_{i,PRE}$ is the mean outcome for individual i over the eligible pre-treatment periods roughly the quarter before launch; δ_t is time fixed effects; and ε_{it} is an idiosyncratic error.[36] Standard errors are clustered by participant. The estimated ATE is τ.

Our initial outcome is emissions from total consumption, measured as CO_2e. We also measure effects on expenditures (SEK) and the carbon intensity of purchases (kg CO_2e/1000SEK). We use the inverse hyperbolic sine transformation for emissions and expenditures as we expect consumption responses to be more proportional to consumption levels than absolute. We collapse our transaction-level panel data to the weekly level to minimize zeroes in the outcome variable.

[34] Raising awareness of personal spending and finances could still have induced behavioral change for some participants.

[35] The pre-analysis plan is available in the AEA RCT Registry at https://www.socialscienceregistry.org/trials/13389. Deviations are described in Appendix D.6.

[36] Equation 1 is an ANCOVA model similar to a standard difference-in-differences model but where the individual fixed effects have been replaced by pre-treatment means of the outcome variable and the model is estimated on post-treatment observations only (see McKenzie, 2012). Given that our panel is unbalanced, we weight observations by the inverse of each participant's number of observed weeks within the estimation period when estimating a single average treatment effect (ATE), giving each participant equal total weight. When estimating separate effects by week or time interval, we give equal weight to each observed participant-week.

We estimate treatment effects on political outcomes using versions of the regression:

$$Y_i = \beta_0 + \beta_1 T_i + \varepsilon_i \tag{2}$$

where Y_i is an outcome for individual i, T_i is a treatment indicator, and ε_i is an idiosyncratic error term. The ATE is captured by β_1.

Additional individual level controls can potentially increase precision and test sensitivity. We follow recent recommendations by Cilliers et al. (2024) and select covariates using a post-double selection (PDS) lasso method with restrictive and model-specific pools of candidate variables. We report versions of the main results with PDS-chosen covariates in the appendix, and detail our approach for choosing them in Appendix D.2.

Multiple hypothesis testing. We account for multiple hypothesis testing (MHT) using outcome family indices and within-family adjustments for a false discovery rate of 5%, based on the outcome families in Appendix Table C.1 (Kling et al., 2007; Anderson, 2008). We report conventional p-values for family indices and individual outcomes in the main analysis. We also calculate sharpened q-values for the most relevant within-family outcomes.

Experimenter demand effects. We do not expect confounding from experimenter demand effects (EDE). We obfuscate the link between the election survey and other parts of the study in multiple ways. It was administered in partnership with SNES, and the content, format, and presentation of the survey matched closely with standard SNES election surveys. The invitation was signed by the SNES director, marked with institutional logos, and accompanied by an information sheet closely resembling those used by SNES (see Appendix H). Climate change questions stood alongside a battery of analogous questions on other issues, including food and health, personal finance and savings, marine protection, acceptance of refugees, and attitudes toward the European Union, among others (see Appendix H for full surveys). We asked respondents at the end of the survey to guess the researchers' intent (Allcott & Taubinsky, 2015); we confirm the successful obfuscation in Section 6.2. We also directly test sensitivity to EDE in the endline survey with 30% of participants by presenting a vignette experiment about crowd-out and crowd-in (de Quidt et al., 2018), and then asking again about support for a carbon tax.[37]

[37]The vignette experiment had two EDE treatments that directly informed subjects of the crowd-out (crowd-in) hypothesis. We gauge the potential influence of EDE by comparing responses across vignettes and against a neutral control.

Attrition. Our treatment and control groups exhibited nearly identical patterns of attrition over the course of our study (Appendix Figure D.1 and Table D.1).

5 Consumption and Lifestyle Responses

5.1 Results

Encouraging personal responsibility for and ability to oneself reduce emission externalities decreased carbon footprints substantially. Treated individuals on average consume (and thereby emit) about 3.6% less the first quarter ($p = 0.020$), as shown in Column 3 of Table I. Thereafter the effect begins to fade, as shown both in the table and in the weekly level event study results in Appendix Figure E.1.[38] Because emissions decreases are very large the first few months of exposure but then backslide, our full sample estimates over the entire seven month study period are imprecise ($p = 0.319$), but would overall imply a decrease of about 1.47% of the total carbon footprint—a large reduction in absolute terms, as discussed below. This is shown in Column 4 of Table I.

Green individuals reduce their emissions nearly twice as much as the average Swede in the sample, as shown in Appendix Figure E.1 and Table I, columns 5 and 6. They decrease their footprint by 7% in the first quarter ($p = 0.021$) and by 3.7% over the full seven months ($p = 0.160$). If changes in personal climate action influence political behaviors, greens may thus also respond more politically and in collective action, empirically grounding our prespecified plan to focus on this subgroup.

Our findings are robust. Including covariates selected by PDS lasso yields identical conclusions: the intervention substantially reduces emissions in the first quarter, with more pronounced effects among greens (see Appendix Table E.1).

5.2 How and how much individualization affects consumption choices

Our estimates imply much larger reductions in emissions than those in prior studies on private conservation interventions, despite comparable absolute effect sizes.[39] For in-

[38] Column 3 of Table I reports separate estimates for three interval bins after treatment, which we refer to as quarters. Because participants needed to manually consent in the app to continued sharing of transaction data every 90 days, we see a drop in available consumption data from disengaged users around weeks 12 and 24 (Appendix Figure D.1). These drops provide natural boundaries for grouping weeks into post-treatment week 1–11, 12–23, and 24 onward, approximately corresponding to these consent periods. The study ends before the third quarter is complete.

[39] See for example Allcott (2011); Sudarshan (2017); Allcott & Kessler (2019); Myers & Souza (2020); Andor et al. (2020); Enlund et al. (2023).

stance, prior studies on home energy reports find reductions in electricity consumption in the range of 2–5% (Carlsson et al., 2021), but housing expenditures (of which electricity consumption is a part) comprise only 12.9% of the average consumer's pre-treatment footprint in our sample. The broader scope of our intervention and comprehensive footprint measure imply reductions that are an order of magnitude larger.[40]

Individuals who are encouraged to themselves help combat climate change by adjusting their lifestyle and the associated emissions appear to do so in large part through lower overall spending rather than lower carbon-intensity consumption. We show this in the first two columns of Appendix Table E.2. The estimates for carbon intensity are noisy, but for example suggest a decrease of around 0.6% for greens in the first quarter (Panel D); substantially less than the 7% percent needed to account for their decrease in emissions during the same period. Greens appear to decrease consumption and emissions in all four broad categories (transport, food, housing, and miscellaneous) in the first quarter, as shown in Panel D of Appendix Table E.2.

Learning may have helped subjects lower their emissions: the treatment enhanced carbon knowledge as measured through a quiz, users' awareness of their consumption, and rating the app as interesting and informative, as shown in Appendix Figures F.2 and E.2 and Appendix Table F.5.[41] We also find evidence of a role for so-called cognitive evaluation and affirmation.[42] Subjects did not see the app as controlling or intrusive, but treated individuals were more likely to report feeling satisfied about their consumption, as shown in Appendix Figure E.2. Aspirations and commitments may also play a role. The treatment app suggested personalized action cards that users could "save", indicating their intent to take specific actions.[43] Subjects were amenable to these suggestions, saving 41% of the suggested action cards, with particularly high take-up of suggestions to eat out less, reduce shopping, and buy fewer clothes, as shown in Appendix Table E.4 and Appendix Figure E.3. Translation into concrete action was more mixed. First-quarter emissions reductions were strongest for clothing, with weaker evidence in other action card categories, as shown in Appendix Figure E.4.

[40] Our ATEs are also if anything conservative relative to what one might expect from a policy roll-out of a carbon footprint calculator like Konsumtionskollen, as they are identified relative to a control that also features rich feedback on consumption.

[41] See Appendix C for our measure of quiz performance and Appendix H for the quiz itself.

[42] Cognitive evaluation theory posits that interventions can induce desired actions by acknowledging and empowering their users, but they can backfire if seen as controlling.

[43] See Appendix A.1 and Appendix Figure A.3 for a description of the action cards.

6 Political Crowd-out and Crowd-in

We have seen that a widely promoted personal agency technology directly and substantially reduces emissions—a key first step in assessing the overall consequences and incidence of individualizing climate responsibility. A full account also includes any potentially more important indirect effects on mitigation through traditional, collective channels and the political engagement they depend on. We expect subjects' moral reasoning to play a key role.

6.1 Modeling and measurement

To illustrate the possibility of crowd-out or -in, consider the following simple model.[44] Consumers can address climate change through private conservation (a_1) and political engagement (a_2). We analyze how an intervention $s \in [0, 1]$ designed to encourage a_1 affects a_2. An agent chooses (a_1, a_2) to maximize

$$U(a_1, a_2; s) = B(a_1, a_2) - C(a_1 + a_2) + \eta s \cdot a_1, \tag{3}$$

where B is utility from the activities and C is effort cost with $C' > 0$ and $C'' > 0$.[45] $\eta s \cdot a_1$, with $\eta > 0$, is the additional value of a_1 attributable to the intervention, which may arise because it increases the salience of a_1 or reduces cognitive frictions (Bordalo et al., 2022).

At an interior solution, totally differentiating the first-order conditions gives

$$\frac{da_2}{ds} = \frac{\eta\,(B_{12} - C'')}{(B_{11} - C'')(B_{22} - C'') - (B_{12} - C'')^2}, \tag{4}$$

where subscripts denote partial derivatives. The denominator is positive by the second-order condition, so $\operatorname{sgn}(da_2/ds) = \operatorname{sgn}(B_{12} - C'')$. Convex effort costs tend toward crowding-out for all agents; for crowd-in to occur, there must be sufficiently strong complementarity in B. We posit that the structure of B will depend on an individual's moral reasoning.

Consequentialists are outcome-oriented. They ask themselves: "How much good did I do?", with primary attention on overall environmental impacts. We can write their production function for environmental benefits as $B^{con}(a_1, a_2)$, in which the two activities are substitutable inputs, so $B^{con}_{12} \leq 0$ and hence $da_2/ds < 0$. Then, encouraging private

[44] Other models and channels for crowd-out/crowd-in are also possible. We focus on this particular one to help elucidate our pre-registered hypothesis.

[45] One may interpret a_1 and a_2 in temporal units (e.g., minutes or hours devoted to private and political actions), making the collective cost function $C(a_1 + a_2)$ natural. Both B and C are twice continuously differentiable.

conservation crowds-out political engagement, consistent with moral licensing and other theories predicting crowd-out (Merritt et al., 2010; Mullen & Monin, 2016).

Deontologists instead ask: "Am I acting like a moral person?" For them, $B^{deon}(a_1, a_2)$ is the moral value of adhering to environmental duties, as both a private consumer and a political being.[46] If fulfilling one duty reinforces the importance of related duties, B^{deon} is supermodular ($B_{12}^{deon} > 0$), leading to crowd-in of political engagement when $B_{12}^{deon} > C''$. Or in the somewhat vivid language of the Sierra Club, one of the prominent organizations in the climate movement that believes in and makes use of deontological messaging: "Individual lifestyle changes can act as a kind of alloy that strengthens political activism. To do the difficult work of walking more lightly on the planet is to bind commitment to conviction" (Sierra Club, 2019).

In practice, individuals may reason in both ways (Bénabou et al., 2024). Let $B = \phi B^{con} + (1-\phi)B^{deon}$, where $\phi \in [0,1]$ is the weight on consequentialist reasoning. Then

$$\text{sgn}\left(\frac{da_2}{ds}\right) = \text{sgn}\left(\phi B_{12}^{con} + (1-\phi)B_{12}^{deon} - C''\right),$$

so crowding-in is more likely the stronger the deontological motivation. Because our empirical measure of moral reasoning is binary, our prediction concerns relative crowd-out/crowd-in by type.

6.2 Responses

We find no evidence of political crowd-out. This holds both in the full sample and the green subsample, as shown in Figure III and Tables II-IV.[47] Treated individuals are not less likely to vote in the EU election, and they do not vote for less green parties. Similarly, emphasizing personal responsibility and action in the fight against climate change did not affect political attitudes: treated individuals are not less likely to cite climate change as an important factor in their voting decision nor to express less support for climate policy. For revealed outcomes elicited in the endline survey, ATEs for petition signing and above-median climate donations were also virtually zero.[48] Treated individuals also do

[46] This is closely related to identity-based models and to "warm glow" or process utility in prosocial behavior (Andreoni, 1989, 1990; Akerlof & Kranton, 2000; Bénabou & Tirole, 2011).

[47] These tables report estimates from Equation 2. Estimates from specifications with PDS-chosen covariates also indicate no political crowd-out; those results are reported in Appendix F.

[48] For the pre-specified outcome of climate donations (SEK), the full-sample estimates are weakly positive (+22.4 out of 500 SEK; $p = 0.039$, $q = 0.084$), which if anything is suggestive of crowding-in.

not assign less responsibility to governments for addressing climate change.[49] In short, ATEs for all political outcomes are consistently null.

These null findings are not due to lack of power. The treatment is high-dosage and induces substantial changes in consumption behavior. Consumption impacts are especially strong among green individuals and in the first quarter of exposure, which coincides with when the first four political outcomes materialize and are measured[50], yet we find no crowd-out in any form of political behavior or engagement. Rather, overall ATEs mask heterogeneous responses by moral reasoning. We focus now on green participants, following our pre-analysis plan.

We find distinct political crowd-out/in for those who reason as consequentialists and those who reason deontologically. Consequentialists display neither crowd-in nor crowd-out. However, deontologists notably show crowding-*in* of political engagement across the board, as shown in Figure III and Tables II–IV.[51] When encouraged to take climate action in and through their personal lives, green deontologists are more likely to vote, vote for greener parties, become more likely to cite climate change as a key factor in their vote, express greater climate policy support, donate more to a climate charity, and are more likely to sign a climate petition. This is in line with our pre-registered hypothesis and the intuition illustrated in the model presented in Section 6.1. We discuss the magnitude of their responses below; they are large. We formally test differential treatment effects for consequentialists and deontologists and find that they are statistically significant for all three political indices, as shown in Tables II–IV. Moral reasoning plays a crucial role in shaping how increased personal responsibility and agency in the climate cause affects political behavior.

These results are robust. They survive checks for multiple-hypothesis testing when analyzing the corresponding pre-specified indices. Moreover, the pattern of results is consistent across six different outcomes drawn from two different surveys that were circulated nearly six months apart. Our consistent findings across outcomes for green deontologists lend further credence to the null results in the pooled sample arising from response heterogeneity rather than lack of power.

[49] We asked participants who they believe should be responsible for addressing climate change in the election survey and the endline survey. We find that this "locus of responsibility" variable is strongly balanced between treatment and control in both surveys (Appendix Figure F.2 and Table F.5), and there is no shift between surveys (Appendix Tables C.4 and C.5.)

[50] These are voting, greenness of party, role of climate change in voting choice, and climate policy support.

[51] This finding is specific to deontologists in the green subsample. This suggests that crowd-in may only occur when the treatment activates a broader, overarching duty for climate change, which would be less likely for non-green deontologists whose duty-based moral reasoning might not so easily extend to the environment and climate change. This is also consistent with our empirical finding of little change in consumption for non-green participants.

The results also are not an artifact of experimenter demand effects. Obfuscation of the election survey was successful, as verified through open-ended responses at the end of the survey. We asked respondents to guess what the researchers were interested in (Allcott & Taubinsky, 2015; Bursztyn et al., 2020; Semken, 2025). No respondent mentioned the app, and only 0.7% and 5.2% mentioned consumption and climate/the environment (Table V).[52] These shares were similar in the treatment and control group, so EDE is unlikely to explain treatment effects for the four outcomes from the election survey. The endline survey was not obfuscated. However, its revealed preference elicitations—petition signing and donating—should be less susceptible to EDE, and we find the same response pattern for these as for outcomes from the obfuscated election survey. Our vignette experiment following de Quidt et al. (2018) reveals some potential scope for EDE in attitudinal questions on climate policy, but this may be due to the unnatural repeated elicitation format (Haaland et al., 2023), and EDE seems unlikely to explain the *differential* impacts that we find across deontologists and consequentialists. We provide a fuller discussion in Appendix D.4.

6.3 How and how much individualization affects political behavior

Research in psychology emphasizes the role of affirming values in instigating positive spillovers (Truelove et al., 2014; Sparkman et al., 2021). Our treatment mobilizes injunctive norms and civic/pro-social appeals while boosting self-efficacy (Semken, 2025), which together appear to bring about or reinforce a general, more action-oriented mindset on climate change, particularly among deontologists.

The magnitude of green deontologists' political crowd-in is substantial. Treatment increases the probability that they vote in the EU election by about 18 percentage points and the greenness of the party they vote for by about 15%. This indicates a significant political shift. Recall that we followed a pre-specified procedure to calculate green scores for each party based on SNES survey responses (Appendix C). The treatment effect of 11.4 (out of 100) could for example arise in a benchmark scenario in which (i) all green deontologists originally vote Liberal (score: 42) but over two-thirds shift their votes to the Social Democrats (score: 57), i.e., from the greenest party in the center-right coalition that governed in 2024 to the closest party in the center-left opposition coalition, or similarly (ii) all green deontologists originally vote for the Left Party (score: 84) but more than two-thirds shift their votes to the Green Party (score: 100). Similarly, the individual action

[52] Mentioning climate or the environment does not itself indicate awareness of the connection to the app study, since these topics appeared explicitly in the survey.

treatment's effect on deontologists' climate policy support is larger than 50%, and that on the importance of climate change to the voting decision about 40%, of the corresponding initial gap between greens and non-greens. Finally, it's worth noting that the endline findings on petition signing and donations indicate political crowding-in that persists well beyond the short-run.

7 Discussion

Regulating externalities is traditionally the realm of government, but measured against reasonable benchmarks (such as the globally ratified goal of holding increases in temperature below 2°C), states have done little to control anthropogenic climate change. Many of the corporations that account for substantial shares of global carbon emissions systematically emphasize *individuals'* ability to influence climate trajectories through their personal life choices. Some climate activists do too. This paper asks whose interests—if anyone's—appear to be served by the last few decades' individualization of climate responsibility. This depends on whether individuals become more or less engaged in the political processes that underpin state action when encouraged to act on a cause personally, through lifestyle choices. It also depends on how any such political crowd-out or crowd-in compares to direct effects on emissions through the same consumption choices.

We find no evidence for the political disengagement and weakening of democratic processes underpinning regulatory efforts that many worry about, despite sustained, high-intensity treatment and a technology that in many ways epitomizes the personal agency zeitgeist. This simplifies our accounting: combined with large (but one-off) direct emissions decreases through consumption among pre-specified green individuals, and political crowd-*in* among those greens who reason deontologically, no-political-crowd-out implies that individual action focus reduces emissions and in this sense benefits the climate movement.[53] Our evidence thus appears consistent with the view of some activist organizations that instilling a sense of personal responsibility if anything helps accelerate more systemic solutions (see also Semken, 2025).

How large are the climate benefits? Suppose the movement's organizations and leaders choose their strategies in a calculated and goal-seeking manner; that is, "as consequentialists". The net benefits of individual action messaging are what they would then

[53]Direct consumption responses and indirect political-engagement-in-the-climate-cause responses have "the same sign". Since neither point towards lower mitigation efforts, we avoid having to quantitatively compare the relative magnitude of responses of different forms and whose ultimate impact on emissions (once regulatory consequences of party vote-shares and other downstream consequences play out, etc.) is difficult to attach numbers to.

compare to those from other possible strategies, such as lobbying policy-makers. We can inform the climate benefits of the direct emissions decreases we find. Consider scaling the technology we study to Sweden's full population.[54] Our estimates would then imply annual emissions reductions on the order of 1 million tonnes CO_2e nation-wide.[55] Best predictions would in turn translate this into roughly 200 million USD in avoided climate damages annually, or 3.6 billion liters of avoided glacier ice melt (∼1400 Olympic swimming pools), 710 gained life-years, and 4.7 km^2 (∼660 football fields) of avoided change in vegetated ecosystems (Semken, 2025). The climate movement would thus need to compare relatively large expected benefits from "individualization" to those expected from other strategies, even if we hypothetically assume that the downstream regulatory benefits of increased political climate engagement are small.

What about corporations like BP, Exxon Mobil, Coca Cola, Anheuser-Busch, and the plastics industry, who finance and promote conscientious consumption ideas and individual responsibility for one's footprint (Sullivan, 2020; Brulle & Werthman, 2021; Supran & Oreskes, 2021; Topping, 2025); do they benefit from their strategy? This paper's results make clear that individual action focus is unlikely to displace "genuine [...] systemic change" within democratic, voter-driven channels (Chater & Loewenstein, 2023b). It could be that such media campaigns—like much advertising (DellaVigna & Gentzkow, 2010)—are ineffective in accomplishing their aim, or that they function as a public form of lobbying and directly influence politicians' outlook and choices (see also Ash et al., 2026).[56] It could also be that such corporate strategies simply have other motives, such as dynamic complementarities—processes through which co-evolving consumer preferences and production or branding choices ultimately benefit adaptive firms.

Whether goal-oriented climate activists and policy-makers should shift their mitiga-

[54]Scale-up of a treatment like ours in classic "libertarian paternalistic", opt-in manner would fall far short of Sweden's climate targets because of modest rates of voluntary take-up. However, an alternative perspective is to see our treatment as embodying the pervasive zeitgeist of individualized responsibility that everyday consumers encounter in their daily lives whether they want to or not. This interpretation naturally implies far larger direct emissions reductions from changed consumer behavior, and simultaneously, any that materialize downstream of green political engagement. In contexts like Sweden, *policy-makers* might also be able to dispatch some technologies similar to the app we use to all adults, rather than requiring active opt-in.

[55]This magnitude is informed by two distinct scenarios: one in which all Swedes respond as the estimated full-sample ATE indicates, and another in which only green individuals respond to treatment (and to the extent that short-run estimates from the first quarter indicate). The latter ATE is roughly 4.5 times as large as the full-sample ATE but greens only comprise one-third of the sample, so both calculations yield a similar order of magnitude. Our calculations and alternative scenarios are in Appendix E.3.

[56]This would imply that legislators' response to personal agency messaging is qualitatively different from that of the individual consumer-voters in our study. If, unlike our participants, legislators are made to believe that climate action is a matter of personal rather than government responsibility, then this could stall or weaken regulation.

tion efforts more towards individual- or system-level change remains a question for future research, but one that this paper begins to delimit and narrow the parameter space for. One fruitful avenue may be to analyze how large-scale individualization of climate responsibility ultimately influences legislation, political discourse, and other outcomes that materialize downstream of elections. Another would be to test for the feedback "back to" individual climate behavior from political outcomes that activists' self-reinforcement hypothesis envisions. Such phenomena are likely to depend on the prevalence and changes over time in different forms of reasoning.

8 Conclusion

This paper directly tests if personal responsibility for and individualized ability to influence a cause crowds out engagement and action through traditional, collective channels for the first time. We use an at-scale RCT distributing an emblematic individual-action technology often promoted both by corporations and (some) activists—a carbon footprint calculator—to investigate and measure a wide range of important personal and political behaviors. We find no evidence of the widely theorized and warned-about "political erosion" or lower s-frame attention in the climate case in Sweden. In fact, we establish a causal, *positive* link between individualized climate action and political engagement for those individuals with green predisposition who reason deontologically. More research is needed, but together with large but one-off decreases in consumption and emissions, this provides first-look causal support for the view of many activists: that personal action and collective, political action can reinforce each other. How large the political benefits to the climate movement are will depend on *how much* more and greener voting and other forms of increased political engagement influence regulations and state action downstream.

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Figure I
Overview of RCT Design and Timeline

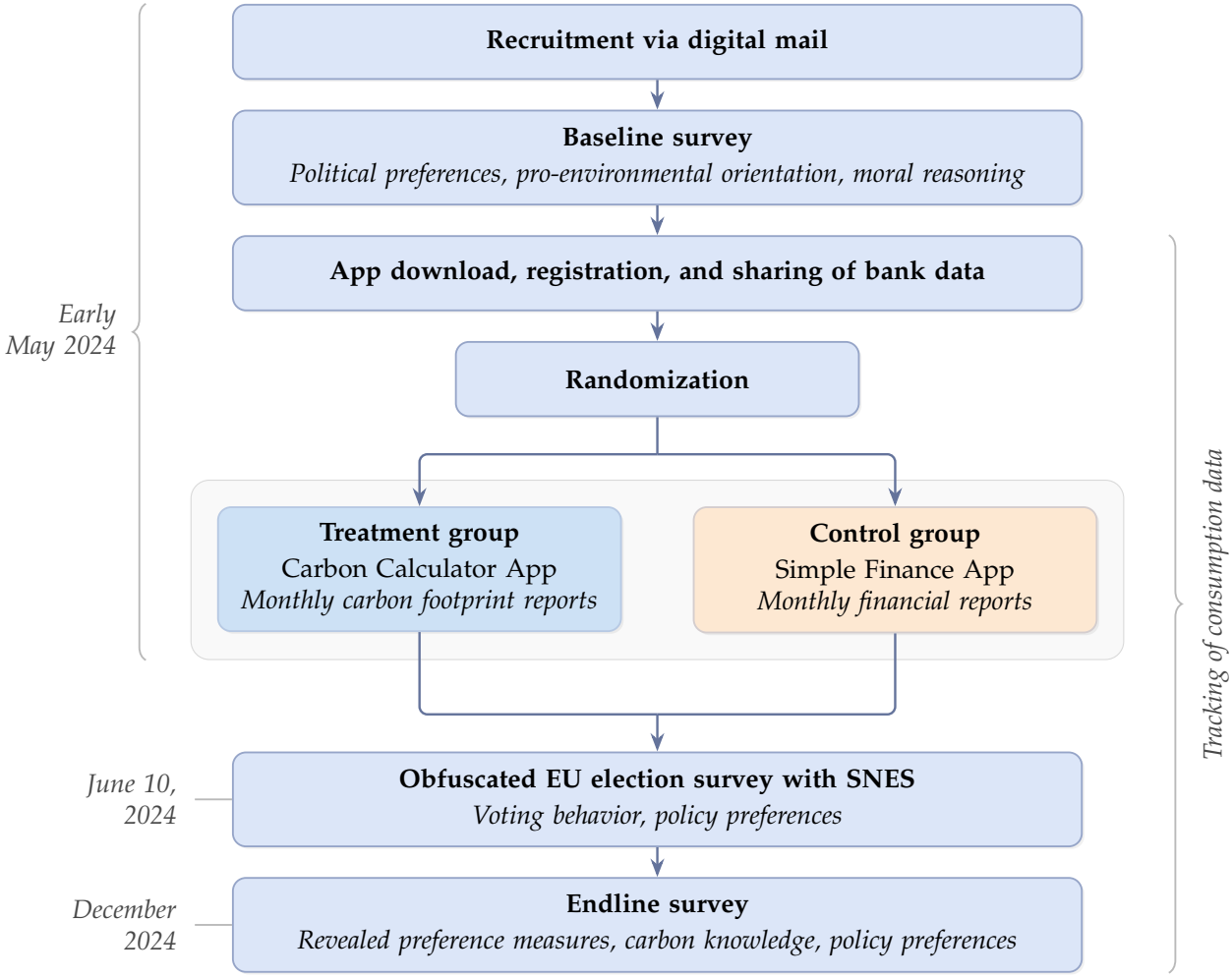
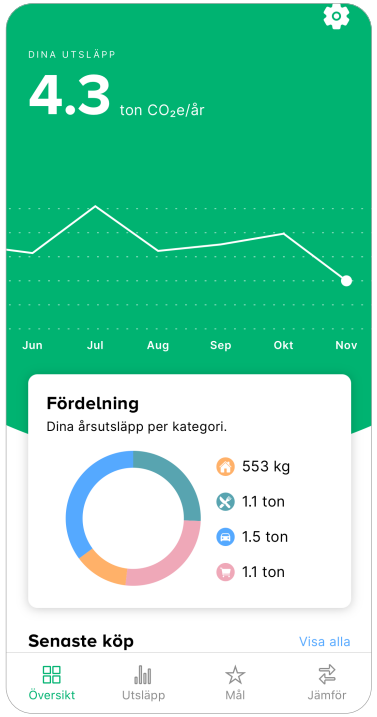


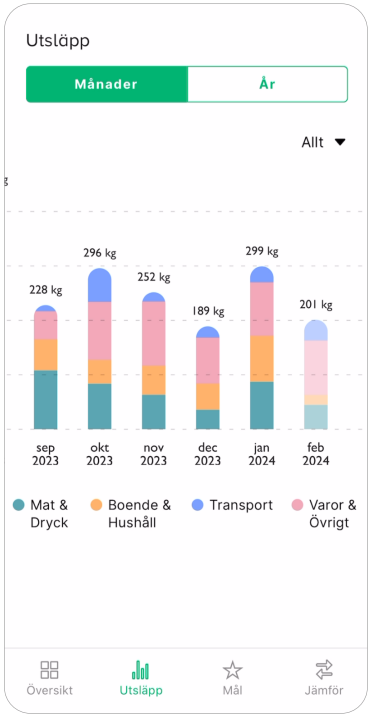
Figure II
The Treatment App: Dashboard, Emissions, Goals, and Peer Comparison

Carbon-footprint dashboard



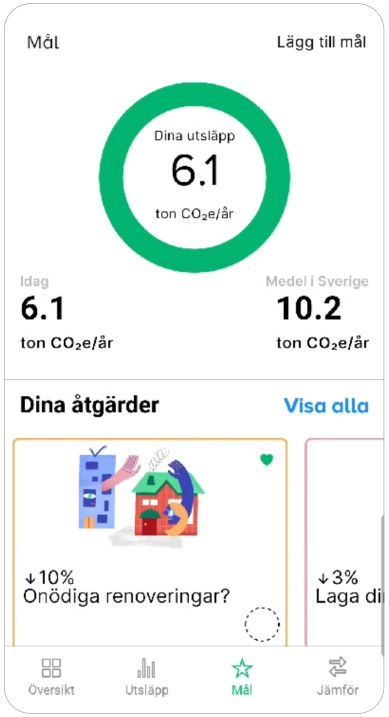
"Your emissions": annual CO_2e emissions, history and emissions by category.

Emissions breakdown



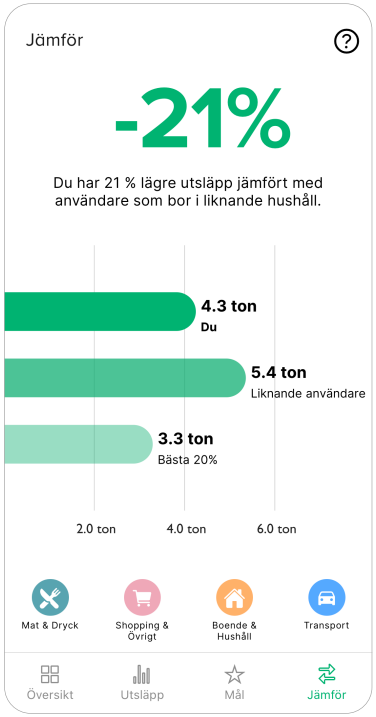
"Emissions": monthly or annual totals, with a category filter.

Goals and saved actions



"Goals", "Add goal" and "Your actions": current emissions, a national benchmark and saved action cards.

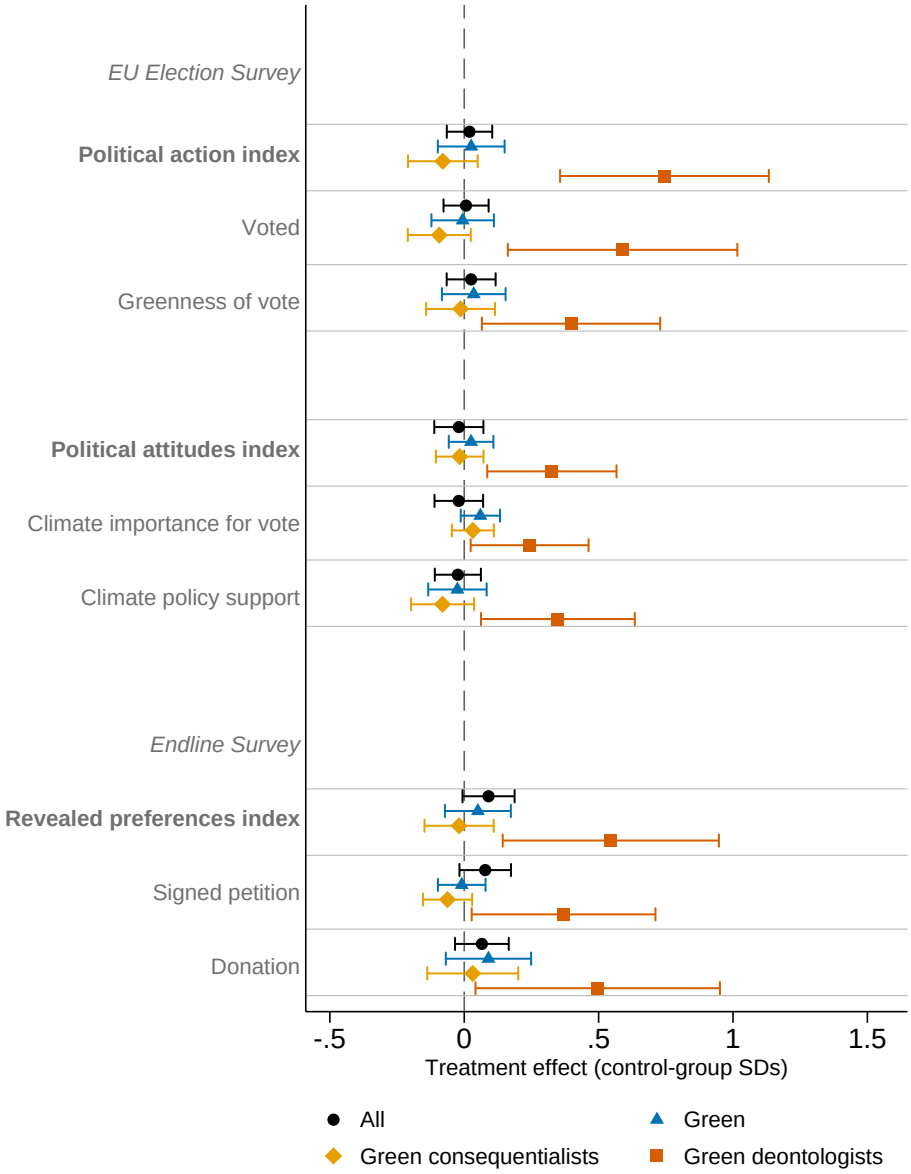
Peer comparison



"You have 21% lower emissions compared with users living in similar households."

Notes: The comparison displays the user, similar users and the "Best 20%". Both arms have a comparison feature; in the control version it concerns expenditure rather than emissions.

Figure III
Treatment Effects on Political Actions and Preferences



Notes: The figure shows the effect of the treatment on political actions, political attitudes, and revealed preference measures for the full sample, green individuals, green consequentialists, and green deontologists. Below each index are its two components. Component outcomes are standardized using the control group mean and standard deviation. Each index is formed from its standardized components and re-normalized using the control group standard deviation of the resulting index. See Tables II – IV for corresponding estimates using original units and Appendix Tables F.1–F.3 for estimates with controls. See Section 3.2 for variable and sample definitions.

Table I
Treatment Effects on Total Carbon Footprint

Post-treatment period:	First quarter		Full period			
Individuals:	All		All		Green	
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.022	0.003		-0.015		-0.037
	(0.019)	(0.023)		(0.015)		(0.027)
Treatment × Green		-0.083*				
		(0.038)				
Green individual		0.033				
		(0.027)				
First quarter			-0.036*		-0.069*	
			(0.016)		(0.030)	
Second quarter			-0.007		-0.019	
			(0.017)		(0.032)	
Third quarter			0.020		0.005	
			(0.022)		(0.040)	
Observations	25,973	25,929	75,335	75,335	18,967	18,967
Individuals	2,593	2,589	3,543	3,543	843	843
Equal weight per:	Individual	Individual	Individual-week	Individual	Individual-week	Individual
Baseline survey required:	Yes	Yes	No	No	Yes	Yes

Note: The dependent variable is asinh(kg CO_2e). Columns 1 and 2 are restricted to the first quarter. Columns 3 and 5 report treatment effects separately for the first, second, and third quarters for all individuals and green individuals, respectively. Columns 4 and 6 report the average treatment effect over the full post-treatment period for the same samples. The quarters are approximate, and estimates use the available post-treatment observations in each, as further explained in Section 5. Columns 1, 2, 5, and 6 are restricted to individuals who passed the baseline survey quality checks. All regressions include year-week fixed effects and control for the individual's pretreatment mean footprint. Columns 1, 2, 4, and 6 give each individual equal total weight within the estimation window regardless of the number of post-treatment weeks available; columns 3 and 5 give each observed individual-week equal weight. Standard errors clustered at the individual level are in parentheses. *Significance levels:* * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table II
Treatment Effects on Political Action

	All	Green	Conseq.	Deont.	Green conseq.	Green deont.
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Voted						
Treatment	0.002	-0.002	-0.010	0.077	-0.028	0.180**
	(0.013)	(0.018)	(0.014)	(0.042)	(0.018)	(0.067)
	[1.000]	[1.000]	[0.864]	[0.159]	[0.319]	[0.016]
Observations	2,151	754	1,850	290	651	100
Mean dep. var.	0.897	0.934	0.905	0.848	0.942	0.880
SD dep. var.	0.304	0.249	0.293	0.359	0.235	0.327
p-value: Green conseq. = green deont.						0.002
Panel B: Greenness of Vote						
Treatment	0.74	1.01	1.04	-1.28	-0.39	11.39*
	(1.33)	(1.73)	(1.43)	(3.77)	(1.87)	(4.85)
	[1.000]	[1.000]	[0.864]	[0.581]	[0.715]	[0.016]
Observations	1,835	684	1,598	228	597	84
Mean dep. var.	71.72	82.27	71.54	73.18	82.11	83.75
SD dep. var.	28.49	22.61	28.45	28.57	22.88	20.62
p-value: Green conseq. = green deont.						0.023
Panel C: Political Action Index						
Treatment	0.020	0.026	-0.004	0.164	-0.080	0.745***
	(0.043)	(0.063)	(0.046)	(0.129)	(0.066)	(0.198)
Observations	2,151	754	1,850	290	651	100
Mean dep. var.	0.020	0.354	0.036	-0.070	0.372	0.238
SD dep. var.	1.000	0.870	0.981	1.098	0.846	1.015
p-value: Green conseq. = green deont.						< 0.001

Notes: The table shows the treatment effects on voting in the 2024 European Parliament election, greenness of the vote, and a political action index combining these two outcomes. Results are reported for the full sample, green individuals, consequentialists, deontologists, green consequentialists, and green deontologists. Anderson (2008) sharpened q-values controlling the false discovery rate across the two component outcomes, calculated separately by specification and sample, are in brackets. The final row of each panel reports the p-value from the corresponding green-sample interaction model testing equality of the treatment effects for green consequentialists and green deontologists. *Significance levels:* * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table III
Treatment Effects on Political Attitudes

	All	Green	Conseq.	Deont.	Green conseq.	Green deont.
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Climate Importance for Vote						
Treatment	-0.017	0.051	-0.023	0.018	0.027	0.207*
	(0.039)	(0.032)	(0.042)	(0.118)	(0.034)	(0.095)
	[1.000]	[0.274]	[1.000]	[1.000]	[0.557]	[0.034]
Observations	1,886	691	1,637	240	602	86
Mean dep. var.	4.489	4.841	4.492	4.471	4.842	4.837
SD dep. var.	0.854	0.414	0.845	0.914	0.416	0.402
p-value: Green conseq. = green deont.						0.074
Panel B: Climate Policy Support						
Treatment	-0.024	-0.025	-0.035	0.068	-0.081	0.348*
	(0.044)	(0.055)	(0.047)	(0.122)	(0.060)	(0.146)
	[1.000]	[0.479]	[1.000]	[1.000]	[0.557]	[0.034]
Observations	2,055	721	1,775	269	623	95
Mean dep. var.	0.004	0.426	0.002	0.013	0.429	0.403
SD dep. var.	0.990	0.744	0.988	1.002	0.748	0.729
p-value: Green conseq. = green deont.						0.006
Panel C: Political Attitudes Index						
Treatment	-0.020	0.025	-0.028	0.033	-0.017	0.326**
	(0.047)	(0.042)	(0.049)	(0.143)	(0.045)	(0.123)
Observations	1,818	664	1,578	231	576	85
Mean dep. var.	0.008	0.473	0.014	-0.028	0.480	0.431
SD dep. var.	0.993	0.543	0.980	1.085	0.541	0.553
p-value: Green conseq. = green deont.						0.008

Notes: The table shows the treatment effects on the importance of climate for the respondent's vote, climate policy support, and a political attitudes index combining these two outcomes. Results are reported for the full sample, green individuals, consequentialists, deontologists, green consequentialists, and green deontologists. Anderson (2008) sharpened q-values controlling the false discovery rate across the two component outcomes, calculated separately by specification and sample, are in brackets. The final row of each panel reports the p-value from the corresponding green-sample interaction model testing equality of the treatment effects for green consequentialists and green deontologists. *Significance levels:* * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table IV
Treatment Effects on Revealed Preferences

	All	Green	Conseq.	Deont.	Green conseq.	Green deont.
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Signed Petition						
Treatment	0.028	-0.003	0.018	0.095	-0.022	0.133*
	(0.018)	(0.016)	(0.019)	(0.053)	(0.017)	(0.063)
	[0.247]	[1.000]	[0.812]	[0.131]	[0.585]	[0.039]
Observations	1,534	565	1,331	196	490	74
Mean dep. var.	0.861	0.961	0.865	0.832	0.963	0.946
SD dep. var.	0.346	0.194	0.342	0.375	0.188	0.228
p-value: Green conseq. = green deont.						0.016
Panel B: Donation						
Treatment	0.033	0.045	0.021	0.113	0.016	0.248*
	(0.026)	(0.040)	(0.027)	(0.071)	(0.043)	(0.116)
	[0.247]	[1.000]	[0.812]	[0.131]	[0.585]	[0.039]
Observations	1,534	565	1,331	196	490	74
Mean dep. var.	0.519	0.641	0.525	0.480	0.651	0.581
SD dep. var.	0.500	0.480	0.500	0.501	0.477	0.497
p-value: Green conseq. = green deont.						0.059
Panel C: Revealed Preferences Index						
Treatment	0.091	0.051	0.058	0.308*	-0.019	0.545**
	(0.049)	(0.063)	(0.053)	(0.144)	(0.066)	(0.205)
Observations	1,534	565	1,331	196	490	74
Mean dep. var.	0.051	0.379	0.065	-0.050	0.395	0.277
SD dep. var.	0.969	0.742	0.964	1.012	0.727	0.830
p-value: Green conseq. = green deont.						0.008

Notes: The table shows the treatment effects on signing the climate petition, donation, and a revealed preferences index combining these two outcomes. Results are reported for the full sample, green individuals, consequentialists, deontologists, green consequentialists, and green deontologists. Anderson (2008) sharpened q-values controlling the false discovery rate across the two component outcomes, calculated separately by specification and sample, are in brackets. The final row of each panel reports the p-value from the corresponding green-sample interaction model testing equality of the treatment effects for green consequentialists and green deontologists. *Significance levels:* * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table V
Obfuscation: Perceived Purpose of Election Survey

	Full sample		Treatment		Control		Difference (C − T)
	(1)		(2)		(3)		(4)
	Share	N	Share	N	Share	N	Share
Answered question on the purpose of the survey	0.688	1,496	0.706	787	0.668	709	-0.038
Mentions app	0.000	0	0.000	0	0.000	0	0.000
Mentions consumption	0.007	15	0.009	10	0.005	5	-0.004
Mentions climate or environment	0.052	114	0.054	60	0.051	54	-0.003
Mentions migration, crime or security	0.010	22	0.008	9	0.012	13	0.004
Observations	2,176		1,115		1,061		2,176

Notes: The sample consists of individuals used to analyze political outcomes in the election survey, i.e. those that passed quality checks in the baseline and election survey. The table summarizes coded responses to an open-ended question at the end of the election survey that asked participants to guess what the researchers behind the survey were specifically interested in. The first row reports the share and number providing a non-missing answer. Column 4 reports the control group share minus the treatment group share, based on a two-sample comparison of means. *Significance levels:* * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.