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Credibility, communication, and climate change: How lifestyle inconsistency and do-gooder derogation impact decarbonization advocacy



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ABSTRACT

The present research examines two distinct pitfalls for advocates aiming to motivate others to use renewable energy and reduce their carbon footprint. Recent research has found that science communicators and advocates may be judged for inconsistency between their behavior and advocacy—where information that an advocate's lifestyle has a large carbon footprint can undermine their appeals to live more sustainably or support policies to address climate change. Conversely, in other advocacy domains, research on do-gooder derogation has found that exemplary behavior among advocates can lead people to feel defensive about their own shortcomings and reject the exemplar and their cause. Do environmental advocates have to worry about both do-gooder derogation and behavior-advocacy inconsistency? Further, do different types of advocates have to worry about these pitfalls equally? To answer these questions, we use an online survey in the United States ($N = 2362$) to contrast the effectiveness of advocacy from peers and from experts across three levels of sustainable lifestyles: not sustainable, somewhat sustainable, and highly sustainable. We find strong evidence for the negative effects of behavior-advocacy inconsistency for both neighbors and experts, albeit much larger impacts for experts. Further, we also find partial evidence for do-gooder derogation for neighbors and experts: highly sustainable advocates were not more influential than somewhat sustainable ones—instead they were marginally worse. Overall, these results suggest that advocates, especially experts, are most credible and influential when they adopt many sustainable behaviors in their day-to-day lives, so long as they are not seen as too extreme.

1. Introduction

Many challenges exist for climate researchers, communicators, and advocates trying to encourage people to live more sustainably and with a smaller carbon footprint. To be an effective advocate, one must consider that there are many factors that go beyond the sheer informational quality of an argument that influence how effective a persuasive appeal may be. Among these are the use of persuasion strategies that take advantage of social dynamics or social influence [1], motivation to identify with others [2], framing and common cognitive biases [3,4], and messenger characteristics [5]. Research on the latter has shown that effective advocacy can depend just as much on characteristics of the messenger as the quality of the message they present. There is a wide range of messenger characteristics that have been shown to influence how persuasive a messenger is—from factors more central to the argument, such as expertise [5], to more peripheral factors such as attractiveness [6]. Understanding messenger effects is

important for understanding advocacy because advocates are messengers who openly and directly aim to persuade others of a cause. Indeed, much of the research on messenger effects is done in examining messengers who serve as an advocate for a specific cause [7]. In the present work, we examine messenger characteristics that influence the persuasiveness of advocates for decarbonization—those who aim to persuade others to adopt actions that decrease carbon dioxide emissions.

Recent research in the context of advocating for energy conservation has found that advocates may be judged not only for the quality of their arguments, but also based on their own lifestyles and personal carbon footprint [8]. In their work, Attari et al. show that climate researchers who have larger personal carbon footprints are vulnerable to criticisms which reduces how credible they are perceived to be and harms the persuasiveness of their conservation appeals [8]. Their research suggests that being a successful advocate for carbon mitigating behaviors may be easier if advocates practice what they espouse by living more sustainably. Similarly, other research finds that residential

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solar advocates who personally do not have solar panels are seen as less credible and are less effective at recruiting other residents to install solar panels than advocates who did have solar panels [9]. Advocacy for decarbonization policies can also suffer the same fate: support for a variety of decarbonization policies is more positive when the policies advocated for by someone with a smaller home carbon footprint in comparison to a higher carbon footprint [10].

There are a variety of reasons why people may not be influenced by communicators and advocates who do not “walk the walk”. People who do not practice what they preach are often seen as hypocrites [11], are more harshly judged by others [7] and disliked for appearing to falsely signal their values [12]. Conversely, advocates who practice what they preach may also be influential because they provide information about how they and others behave and provide demonstrations of how to follow the advice they provide [13–15]. Research on social influence finds that learning about others’ decarbonizing actions, such as a more efficient neighbors’ household energy usage [16] and the efforts of others to consume less meat [17], can lead people to follow in suit. Advocates who do not appear to be taking action may, inadvertently, be signaling that something is not urgent. Indeed, even in the face of obvious signal of danger, like smoke entering a room, people are likely to assume that something is not urgent if others do not take action [18]. Seeing others take action can help observers perceive climate change as an emergency, while an advocates’ inaction could lead people to conclude that it may not be as urgent as they are being told [19].

Should advocates live exemplary sustainable lifestyles to be credible and effective communicators? Other research suggest that exemplary behavior may not always be so helpful, and may actually be detrimental. Research on social comparison and “do-gooder derogation” finds that people may dislike others who perform exceptionally well in domains where they do not [20]. When advocates for environmental behaviors practice what they preach, they may be ripe targets for do-gooder derogation. Indeed, research has found that those who discuss their own sustainably-minded consumer behavior when advocating for reduced packaging may annoy the targets of their advocacy, turning people off from the idea [21].

Why would seeing advocates practice what they preach backfire? People are frequently drawn to making comparisons to others in order to evaluate oneself [22]. When people evaluate others who perform better than oneself, particularly in moral domains, they may feel negatively about themselves [20]. However, people are highly motivated to maintain a positive view of themselves as moral, competent and contributing members of society [23] and may seek to derogate others, including the do-gooder, to decrease the negative feelings that may arise about themselves [24,25]. Research finds that people take aim at do-gooders in a range of domains, from eating a vegetarian diet [24] to speaking up against prejudice [26]. Advocates’ efforts may also be harmed by being do-gooders: research has found that when physicians “practice what they preach” and live in a very healthy manner, for instance, their patients may anticipate being negatively judged, and avoid their physician [27]. Thus, advocates who are do-gooders can also be understood as naturally soliciting a form of psychological reactance—a desire to disobey or resist influence from others [28]: marginalizing the do-gooder and their cause offers people a tempting way to maintain a positive self-view and freedom to choose their own actions. Further, if do-gooders appear highly dissimilar to us, they may fail to provide a viable model for us to learn from and fail to raise our beliefs that we can accomplish what they have [14]. Given the variety of reasons do-gooders may not make ideal advocates, in the present research we ask: Are decarbonization advocates less effective if their lifestyles exemplify sustainability? Research in the context of advocates for decarbonization has found that living more sustainably can help avoid negative effects from behavior-advocacy inconsistency, but is there also some risk of do-gooder derogation, and if so for whom?

We answer these research questions in the context of advocacy efforts to promote residential renewable energy programs, which give

residents the option to purchase energy from renewable sources. When purchased by large numbers of residents, such programs can help build capacity for renewable energy sources [29]. Such voluntary programs may generally require little government intervention, but do rely on residents’ motivation [30,31], making it important to understand how advocacy efforts can increase demand. We assess advocacy efforts in this context in two ways: (1) Are advocates perceived as credible? (2) Are advocates effective at increasing people’s interest in residential renewable energy programs? We choose to include credibility in addition to measures of interest here because credibility is a crucial quality among environmental advocates and scientists [32] and the absence of credibility in the eyes of the general public and decision makers can undermine the transition to renewable energy [33].

In the context of promoting purchasing energy from renewable sources, the present research investigates two common, but distinct, forms of advocacy: experts delivering a sustainability talk, and peers discussing sustainability. Prior research has shown that social interactions play an important role in disseminating sustainable behavior, and have consequences above and beyond information about sustainability alone [34]. It is therefore important to understand which kind of social interactions and social agents are most helpful in this pursuit. We compare the performance of types of advocates (experts, peers who are neighbors) with highly sustainable lifestyles, somewhat sustainable lifestyles, and unsustainable lifestyles. Given prior research on behavior-advocacy inconsistency, we hypothesize that unsustainable advocates will be less persuasive than more sustainable ones. However, research on do-gooder derogation suggests that more is not always better, thus we hypothesize that those who live highly sustainable lifestyles will not perform better than those who live moderately sustainable lifestyles and instead could perform worse.

Further, we test the hypothesis that different advocates will experience different kinds of pitfalls. According to the self-evaluation maintenance model, the closer one is to a high-performing other, the greater the risk for a loss in self-evaluation [35]. This is because those who are closer to us are more likely to be raised in self-comparison processes, and, if their performance exceeds our own, our performance appears relatively poorer. By contrast, those who are perceived as more socially distant, such as those with very different social status or those who we have fewer social interactions with, run little risk of social comparison and therefore less risk of a threat to oneself. Therefore, we predict that experts who are more socially distant to be less subject to do-gooder derogation, while those close to us in our lives, our friends, neighbors, and co-workers, may be more subject to do-gooder derogation. As exploratory analysis, we also test whether behavior-advocacy inconsistency effects are equivalent for experts and for neighbors.

2. Method

2.1. Participants

Adults ($N = 2362$) were recruited online via Amazon’s Mechanical Turk in November 2018. They were compensated \$0.60 for their participation. Each participant had a unique IP address in the United States. The survey was advertised with the description: “Fill out a short survey. Requires some reading. About 4–6 min.”. Given that we were unsure how strong the predicted interaction effect would be, we had a targeted sample size per cell of at least three hundred participants per condition. This design is more than 80% powered to detect a small effect ($f = 0.1$).

This experiment was conducted at a time when an increase in “bot,” “click-farm,” and other suspicious activity had been observed on Amazon’s Mechanical Turk [36]. To address data quality concerns, we coded participants’ responses for potential evidence that participants were not from the U.S. using geolocation information and free response quality (see the Supplemental Material for full coding description; this method is similar to others that have been validated [37]). Two coders

coded the open-ended responses and achieved a high inter-rater reliability ($Kappa = 0.97$). Discrepancies were resolved through consensus. Out of our total sample, 7% (158) responses were coded as likely coming from non-U.S. participants and were dropped from analysis.

Of the 2204 participants remaining, 54% self-identified as female, 45% as male, and less than 1% as non-binary. The mean age for participants was 37. The median household income was \$40,000–\$80,000 and the median education level was holding a college degree. Fifty-one percent self-identified as liberals, 22% as moderates, and 27% as conservatives. Compared to the U.S. population, this sample is, on average, younger, more educated, more liberal, and more female [38]. While not representative of the U.S. population, our sample has more than sufficient heterogeneity to investigate and answer our research questions.

Seventy-five participants (3.4%) reported that they already had a 100% renewable electricity plan for their home. These participants were dropped from analyses on the measure of interest in the vignette as they would not be able to change this behavior (and may have found the request to sign up for a renewable energy program a confusing hypothetical).

This research was approved by Indiana University Bloomington and Stanford University's Internal Review Board at the Office of Research Administration, and informed consent was received from all participants. The entire survey is available in the Supplemental Material.

2.2. Procedure

2.2.1. Manipulation

In the first portion of the study, participants were randomly assigned to read one of six vignettes. In all conditions, participants read about "Katherine Branner" who advocates for people to use an "optional renewable energy program" for household energy. The program is described as powering one's home "by solar, wind and other renewable energy sources", which, they are told, "only costs about 10% more than the standard package." Branner also makes a more general suggestion to consider other lifestyle changes that impact one's carbon footprint, such as choices regarding one's travel and diet.

The vignettes differ in two major ways. First, in half of the vignettes, participants are told that "Dr. Katherine Branner" is a leading scientist giving a public talk, while the other half of participants read that "Katherine Branner" is a neighbor they encounter while returning home. In both cases, participants were told that they know that Branner is knowledgeable about climate change and advocates for living in an environmentally sustainable way. Second, Branner's personal lifestyle differs in terms of either being highly environmentally sustainable, somewhat sustainable, or unsustainable, as described below. Thus, the experiment has a two (type of role either expert or neighbor) by three (sustainability performance) between-subjects design (see the Supplemental Material for full text for all conditions).

While discussing sustainability more generally, Branner mentions her own experiences including her lifestyle choices. In the *high sustainability condition*, Branner mentions that her household energy consumption is in the top 1% in terms of energy efficiency, that she has signed up for the optional renewable energy package, that she doesn't eat meat or cheese, and that she always avoids flying. In the *somewhat sustainable condition*, Branner mentions that her household energy consumption is in the top 50% in terms of energy efficiency, that she has signed up for the optional renewable energy package, that she has reduced but not eliminated her meat consumption, and that she avoids flying when she can. In the *unsustainable condition*, Branner mentions that her household energy consumption is in the bottom 5% in terms of energy efficiency, that she has considered signing up for the optional renewable energy package but hasn't done so yet, that she eats a lot of meat and should cut back, and that she has thought about avoiding flying, but hasn't made any effort to do so yet. Note that the advocate only describes her own behavior and expresses her own beliefs regarding sustainable behavior rather than describing what others do:

these condition materials are designed to avoid signaling what behaviors or beliefs are the norm more generally to avoid confounds pertaining to social norm signaling.

2.2.2. Dependent measures

Next participants completed our primary outcome measure assessing their interest in following the advocate's suggestion to look into the renewable energy program: "How likely would you be to take Katherine Branner's suggestion to look into the optional renewable energy program?" (1 = *Not at all likely*, 5 = *Very likely*).

Next participants answered questions to assess their perception of the credibility of the advocate. This is an adapted measure from Attari et al. [8]. Credibility was assessed based on agree-disagree responses (1 = *Strongly disagree*, 4 = *Neutral*, 7 = *Strongly agree*) for 7 survey items:

- 1 I believe that Katherine Branner's behavior is consistent with her advice.
- 2 I believe Katherine Branner's advocacy is sincere
- 3 I do not trust Katherine Branner's authority with respect to climate science
- 4 I believe that Katherine Branner has good reasons for her behavior
- 5 I am doubtful of Katherine Branner's credibility
- 6 I believe that Katherine Branner provides quality advice.
- 7 I believe the information Katherine Branner told me is true.

The responses were analyzed similarly to Attari et al. [8]: agreement was coded numerically 1 – 7, in order of increasing credibility (i.e., "strongly agree" was coded as 1 for the third and fifth items, but as 7 for the others). These codes were summed and the sum rescaled, with the maximum score (+1) representing strong researcher credibility for all six items and the minimum score (–1) being contrary agreement for all six. This scale had high reliability ($\alpha = 0.76$).

2.2.3. Manipulation checks

We assessed manipulation checks after the outcome measures, rather than before, to avoid the possibility that reflecting on the manipulation checks would lead these measures to affect participants' outcomes. To evaluate whether the manipulation of neighbor and expert successfully influenced the social distance of the target, participants were asked three items, corresponding to two common dimensions of social distance: similarity of social status and frequency of social interaction [39,40]. Specifically, participants were asked how similar their social status was to the advocate's social status (1 = *Not at all similar*, 5 = *Very similar*), to what extent they would consider the advocate a peer (1 = *Not at all*, 5 = *A lot*), and how often they thought they would encounter the advocate in day-to-day life (1 = *Almost never*, 5 = *Often*). These items were all reverse coded and then averaged into a single score, where higher values indicate greater social distance. This scale had high reliability ($\alpha = 0.76$). To evaluate participant's perceptions of the advocate's performance in sustainability, participants were asked how Branner's environmental footprint compared to the average Americans (1 = *Extremely small*, 5 = *Larger than average*).

2.2.4. Individual difference measures and demographics

Participants were then asked whether they already had a 100% renewable energy program. Participants then answered two questions about climate change beliefs. The lead-in passage and items were similar to those used by Leiserowitz et al. [41].

Recently, you may have noticed that climate change has been getting much attention in the news. Climate change refers to the idea that the world's average temperature has been increasing over the past 150 years, may be increasing more in the future, and that the world's climate may change as a result.

Do you think that climate change is happening? (4 = *Yes, definitely*, 3 = *Yes, probably*, 2 = *No, probably not*, 1 = *No, definitely not*)

How important is the issue of climate change to you personally? (4 = Very important, 3 = Somewhat important, 2 = Not too important, 1 = Not at all important)

The survey concluded with questions about political orientation and some demographic items: gender, age, income, and education.

3. Results

3.1. Manipulation checks

As expected, participants' ratings of social distance were greater for experts ($M = 3.73$ $SE = 0.025$) than for neighbors ($M = 2.99$ $SE = 0.023$), $t(2202) = 21.48$, $p < 0.001$, $d = 0.92$, 95% CI of the difference = [0.68, 0.81].

Also, as expected, participants ratings of the advocate's environmental footprint were significantly impacted by performance, $F(2, 2201) = 525.72$, $p < 0.001$. Specifically, unsustainable advocates were rated as having a larger environmental footprint ($M = 3.99$ $SE = 0.036$) than somewhat sustainable advocates ($M = 2.89$ $SE = 0.035$), $t(2201) = 20.21$, $d = 1.14$, $p < 0.001$, 95% CI of the difference = [0.99, 1.21]. And advocates in the somewhat sustainable condition were rated as having a larger environmental footprint than highly sustainable advocates ($M = 2.25$ $SE = 0.043$), $t(2201) = 11.75$, $p < 0.001$, $d = 0.59$, 95% CI of the difference = [0.53, 0.74].

3.2. Credibility

3.2.1. Main effects of advocate role

While not part of our primary hypotheses, we expected that advocate type would impact perceptions of credibility such that experts would be seen as more credible than neighbors. Unexpectedly, when collapsing across advocate performance, we found greater levels of perceived credibility for participants who read about a neighbor ($M = 0.48$ $SE = 0.010$) compared to those who read about an expert ($M = 0.44$ $SE = 0.011$), $t(2201) = 3.19$, $p = 0.001$, $d = 0.14$, 95% CI of the difference = [0.02, 0.08]. While we did not predict this result, there is longstanding work showing that friends, family, and local leaders can be more influential than experts [42]. One possible explanation for this result is that neighbors may appear to be more familiar or knowledgeable about this domain as they physically and situationally closer to the person.

3.2.2. Main effects of advocate performance

Collapsing across advocate role, there was a significant effect of how sustainable the advocate's lifestyle was on their perceived credibility $F(2, 2200) = 253.29$, $p < 0.001$. As hypothesized, and in line with past work on behavior-advocacy inconsistency effects on climate communication, unsustainable advocates were seen as less credible ($M = 0.24$ $SE = 0.013$) than somewhat sustainable advocates ($M = 0.57$ $SE = 0.011$), $t(2200) = -19.79$, $p < 0.001$, $d = -1.02$, 95% CI of the difference = [-0.36, -0.30]. Unsustainable advocates were also seen as less credible than highly sustainable advocates ($M = 0.56$ $SE = 0.011$), $t(2200) = -19.21$, $p < 0.001$, $d = -0.96$, 95% CI of the difference = [-0.35, -0.28]. We find no difference between highly sustainable advocates and somewhat sustainable advocates on perceived credibility, $t < 0.7$.

3.2.3. Interaction of advocate role and performance

As hypothesized, we find a significant omnibus interaction between the advocate's role and performance on perceived credibility $F(2, 2197) = 9.82$, $p < 0.001$. However, examining the condition differences (see Fig. 1), it appears the interaction is driven by behavior-advocacy inconsistency effects being worse for experts than neighbors: experts who live unsustainably were seen as much less credible than more sustainable experts, while neighbors who live unsustainably were only seen as somewhat less credible than more sustainable neighbors.

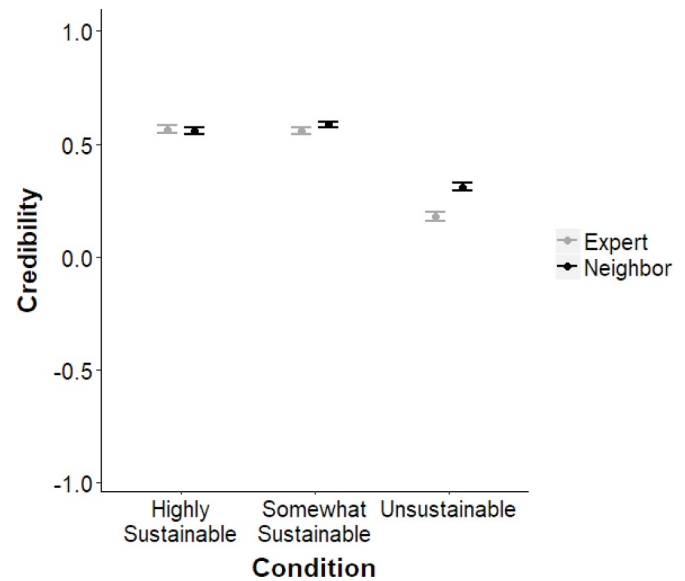


Fig. 1. Interaction between advocates' role and sustainability performance on perceptions of advocates' credibility: Unsustainable experts suffer greater behavior-advocacy inconsistency effects than unsustainable neighbors. Highly sustainable experts and highly sustainable neighbors are not seen as more credible than their somewhat sustainable counterparts. Error bars represent standard errors.

To test this directly, we ran an interaction of advocate role and performance including only somewhat sustainable and unsustainable advocates to contrast effects of behavior-advocacy inconsistency across experts and neighbors, and found the interaction term to be significant, $t(1454) = 3.10$, $p = 0.002$, such that the difference between unsustainable and somewhat sustainable experts was greater than unsustainable and somewhat sustainable neighbors. In essence, experts who live unsustainably were much less credible than more sustainable experts, while neighbors who live unsustainably were only somewhat less credible than more sustainable neighbors.

Evaluating simple contrasts, we find that unsustainable experts are seen as less credible ($M = 0.18$ $SE = 0.019$) than somewhat sustainable experts ($M = 0.56$ $SE = 0.016$), $t(2197) = -16.30$, $p < 0.001$, $d = 1.07$, 95% CI of the difference = [-0.43, -0.33]. We find that unsustainable neighbors are also seen as less credible ($M = 0.31$ $SE = 0.017$) than somewhat sustainable neighbors ($M = 0.59$ $SE = 0.014$), $t(2197) = -11.90$, $p < 0.001$, $d = 0.88$, 95% CI of the difference = [-0.32, -0.23]. Further, unsustainable experts are less credible than unsustainable neighbors $t(2197) = -5.62$, $p < 0.001$, $d = 0.47$, 95% CI of the difference = [-0.18, -0.09]. Highly sustainable experts are also seen as more credible ($M = 0.57$ $SE = 0.017$) than unsustainable experts $t(2197) = -16.73$, $p < 0.001$, $d = 0.39$, 95% CI of the difference = [-0.43, -0.34]. Similarly, highly sustainable neighbors are seen as more credible ($M = 0.56$ $SE = 0.015$) than unsustainable neighbors, $t(2197) = 10.67$, $p < 0.001$, $d = 0.78$, 95% CI of the difference = [0.20, 0.29].

3.2.4. Individual differences and demographics

In a multiple regression including gender, political orientation, age, income, education, perceived climate change certainty, and perceived climate change importance, having greater perceived certainty and importance of climate change, as well as less education, all predicted greater perceptions of credibility. See Table S2 for full regression analysis of individual difference and demographic measures on credibility.

3.3. Interest in renewable energy

3.3.1. Main effects of advocate role

We made no prediction about advocate type and interest in the renewable energy program. Collapsing across all levels of advocate performance, we find similar levels of interest for participants who read about a neighbor ($M = 2.96$ $SE = 0.037$) compared to those who read about an expert ($M = 2.88$ $SE = 0.037$), $t < 1.6$. It is notable that experts appear to have no overall advantage when it comes to this type of advocacy.

3.3.2. Main effects of advocate performance

Collapsing across advocate role, there was a significant effect of how sustainable an advocate's lifestyle was on how effective they were at increasing participant's interest in the renewable energy program ($F(2, 2126) = 14.57$, $p < 0.001$). As hypothesized, and in line with behavior-advocacy inconsistency effects on climate communication, unsustainable advocates were less effective ($M = 2.73$ $SE = 0.045$) than somewhat sustainable advocates ($M = 3.06$ $SE = 0.046$), $t(2126) = -5.29$, $p < 0.001$, $d = 0.28$, 95% CI of the difference = $[-0.46, -0.21]$. Unsustainable advocates were also less effective than highly sustainable advocates ($M = 2.96$ $SE = 0.045$, $t(2126) = -3.61$, $p < 0.001$, $d = 0.19$, 95% CI of the difference = $[-0.36, -0.11]$). As hypothesized, and in line with possible do-gooder derogation effects, we find that highly sustainable advocates are not more effective than somewhat sustainable advocates—in fact, they are marginally less effective $t(2126) = -1.69$, $p = 0.09$, $d = -0.09$, 95% CI of the difference = $[-0.23, 0.02]$.

3.3.3. Interaction of advocate role and performance

As hypothesized, we find a significant omnibus interaction between the advocate's role and performance on the of participants' level of interest $F(2, 2123) = 4.25$, $p = 0.014$. However, examining the condition differences (see Fig. 2), it appears the interaction is driven by behavior-advocacy inconsistency effects being worse for experts than neighbors. To test this difference in differences, we ran an interaction of advocate role and performance including only somewhat sustainable and unsustainable advocates to contrast behavior-advocacy inconsistency effects across experts and neighbors, and found the interaction term to be significant, $t(1407) = 2.55$, $p = 0.011$, such that the

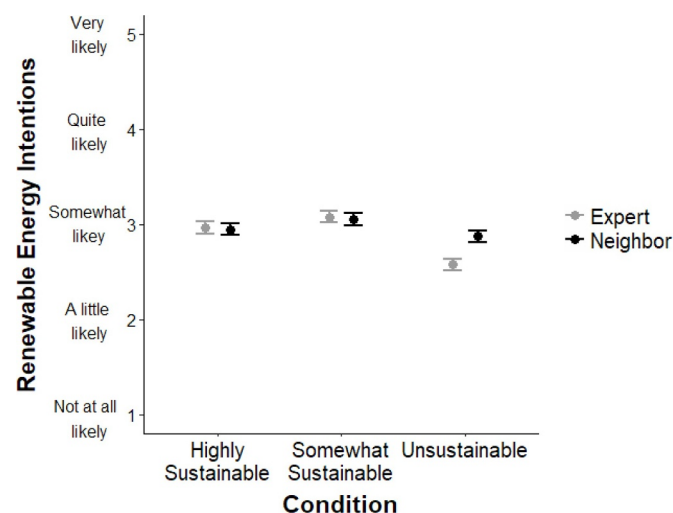


Fig. 2. Interaction between advocates' position and sustainability performance on interest in look into a renewable energy program: Unsustainable experts suffer greater behavior-advocacy inconsistency effects than unsustainable neighbors. Both highly sustainable experts and highly sustainable neighbors have marginal do-gooder derogation effects compared to their somewhat sustainable counterparts. Error bars represent standard errors.

difference between unsustainable and somewhat sustainable experts was greater than unsustainable and somewhat sustainable neighbors. Essentially, expert's effectiveness in advocacy suffers relatively more from having an unsustainable lifestyle than neighbors do.

Examining simple contrasts, we find that unsustainable experts are less effective ($M = 2.57$ $SE = 0.065$) than somewhat sustainable experts ($M = 3.08$ $SE = 0.062$), $t(2123) = -5.56$, $p < 0.001$, $d = 0.50$, 95% CI of the difference = $[-0.68, -0.32]$. While we find that unsustainable neighbors are also less effective ($M = 2.87$ $SE = 0.062$) than somewhat sustainable neighbors ($M = 3.05$ $SE = 0.067$), the difference is much less substantial, albeit still significant, $t(2123) = -1.97$, $p < 0.049$, $d = 0.09$, 95% CI of the difference = $[-0.35, -0.00]$. Further, unsustainable experts are less effective than unsustainable neighbors $t(2123) = -3.29$, $p = 0.001$, $d = 0.23$, 95% CI of the difference = $[-0.48, -0.12]$. Notably, while highly sustainable experts are more effective ($M = 2.97$ $SE = 0.064$) than unsustainable experts $t(2123) = 4.35$, $p < 0.001$, $d = 0.39$, 95% CI of the difference = $[0.21, 0.57]$, highly sustainable neighbors are not more effective ($M = 2.95$ $SE = 0.063$) than unsustainable neighbors, $t < 1$.

3.3.4. Individual differences and demographics

In a multiple regression including gender, political orientation, age, income, education, perceived climate change certainty, and perceived climate change importance, we find that being liberal, younger, and having greater perceived importance of climate change all predicted greater interest in the renewable energy program. While greater certainty in climate change predicts greater interest when tested alone, in the multiple regression with all the individual difference measures, greater certainty predicts less interest. See Table S3 for full regression analysis of individual difference and demographic measures on level of interest.

4. Discussion

These results show that both experts and neighbors suffered from behavior-advocacy inconsistency effects: when advocates lived unsustainable lifestyles, there were less successful at encouraging others to sign up for a residential renewable energy program. However, behavior-advocacy inconsistency effects were significantly worse for experts than neighbors. It appears that people are more forgiving of neighbors' unsustainable lifestyles than of experts' shortcomings—perhaps because we hold experts to higher standards for behavior-advocacy consistency than we hold peers. This also appears to be true for perceptions of advocates' credibility.

Further, these data find that living a highly sustainable lifestyle (buying renewable energy, having an extremely efficient home, completely avoiding flying, and eating no meat or cheese) does not make advocates even more effective than living a somewhat sustainable lifestyle (buying renewable energy, having a fairly energy efficient home, and making substantial efforts to curb meat eating and flying). In fact, disclosing one's highly sustainable lifestyle amid giving others an appeal to change may run the risk of raising do-gooder derogation, where advocates' exemplary lifestyles may make others feel defensive about their own shortcoming leading them to dislike the advocate and their cause. As such, we found that highly sustainable advocates were marginally less effective at increasing interest in the renewable energy program and no more credible than somewhat sustainable ones. Those who were somewhat sustainable fared well and do not appear to have suffered from concerns about behavior-advocacy inconsistency or do-gooder derogation. It's also possible that participants saw less of a contrast between themselves and the somewhat sustainable advocate: participants may have believed they were more sustainable than unsustainable advocates, and less sustainable than the highly sustainable advocate. If true, somewhat sustainable advocates may also benefit from perceptions of greater similarity, and therefore serve more easily

as a social model [14]. Indeed, in a post hoc analysis we find that somewhat sustainable advocates are perceived to be slightly less socially distant than highly sustainable advocates ($d = 0.11$, see the Supplemental Material).

Experts appear to be judged more harshly, as their efforts suffer more greatly from behavior-advocacy inconsistency. This is unfortunate given that experts, with their wealth of knowledge and dedication to the topic, hold an irreplaceable role in increasing understanding by disseminating science and in advocacy for action on climate change. Notably, advocacy itself may not be problematic for climate change experts. Scientists, academics, and others can advocate for climate related policies and solutions in a number of ways [43], and are able to do so without hurting their credibility to the public [44] or their colleagues [45]. Research suggests that experts may be able to make substantial reductions to their footprint, such as reducing flying, without adversely affecting their academic success [46]. However, if experts involved in advocacy are unwilling to live somewhat sustainable lives, they may have trouble avoiding negative effects of behavior-advocacy inconsistency. By comparison, neighbors experienced much weaker behavior-advocacy inconsistency effects. In fact, for neighbors there was no significant difference between being highly sustainable and being unsustainable for participant's interest in adopting renewable energy. This may present a silver lining to these findings: non-professionals, no matter their lifestyle, can still be fairly effective advocates for decarbonization.

4.1. Limitations & future directions

In the present research we examined behavior-advocacy inconsistency effects and do-gooder derogation effects in the context of someone self-disclosing their personal actions. While self-disclosure is not uncommon for advocates of sustainability [47,48], in other contexts the targets of advocacy may come to learn about an advocate's sustainable practices through their own inquiry, a third party, or some other indirect means. For example, after the release of "An Inconvenient Truth" Al Gore came under attack for his household energy consumption from a series of news articles attempting to impugn his reputation and the sincerity of his cause [49]. It is possible that our results would differ if the information about the advocate's lifestyle were learned through some other means or method. Future research is needed to assess whether the form and source of disclosure about an advocate's lifestyle impacts the results found here.

The operationalization of do-gooders used in the present work required the advocate stating both the criteria for living sustainability (references to home energy, diet, and flying) as well as their excellent performance relevant to that criteria. However, participants may lack personal knowledge about how these behaviors correspond to sustainability. For instance, participants may have been unaware that dietary choices have a substantial impact on the environment. If participants felt great uncertainty about whether these actions were actually important to sustainability, they may not have experienced any negative social comparison to do-gooders. Therefore, one possibility is that do-gooder derogation may be more prominent in cases where people already understand the importance of or care about the domain and behavior their performance is being compared on.

The study design used here relies on asking all our participants to envision highly similar vignettes in order to control for all aspects beyond those we seek to manipulate. This ensures strong internal validity, but raises questions regarding external validity and generalizability. In particular, our approach does not assess actual behavior change and instead assesses self-reported interest in the vignettes which may differ from real-world behavior. Further, a survey experiment is limited in terms of providing realistic experiences with advocates. In particular, a fictional peer may not adequately resemble the vivid information people would have in real life about one's neighbors. Therefore, it's possible that rich social interactions that come with real social ties may

produce different and potentially stronger results than those found here. Similarly, envisioning attending a talk may differ from actually attending a presentation in ways that meaningfully change the results observed here. The present research lays the groundwork for studies seeking to assess such phenomenon in the field which can provide greater confidence in how they generalize to real-world experiences.

While the present research examined an important outcome, interest in a residential renewable energy program, it is possible that results may differ for other sustainable behaviors. For instance, past research on eliminating meat consumption has found stronger evidence for do-gooder derogation than we found in the present context [24]. Therefore, the relative strength of behavior-advocacy inconsistency and do-gooder derogation may vary across different domains of sustainability. Further research is needed to explore how behavior-advocacy inconsistency effects and do-gooder derogation may differ depending on the behavior in question.

We also need to better understand how to overcome behavior-advocacy inconsistency concerns and do-gooder derogation. Recent research on advocacy for decarbonization policies finds that when advocates indicate that they have reduced their carbon footprint from a previously high footprint, credibility is restored [10], i.e., advocates are judged on their current carbon footprint and not their past footprint. More generally, information about others changing has been shown to be inspirational [50], and help resolve a variety of psychological barriers that prevent personal change [51]. In the advocacy context, it may also be helpful address threats to one's self image from comparisons to do-gooders. Specifically, if advocates indicate they have changed and had to improve over time, they may present themselves not as perfect exemplars, but as people who have not always acted ideally, much like the audience they're addressing. Exploring the consequences of advocates disclosing that they changed may thus be a fruitful direction for future research.

5. Conclusion

We find that advocates for decarbonization are more influential when they take action to reduce their personal carbon footprint, including having an energy efficient home, using renewable energy, reducing their meat consumption, and how often they fly. This is especially true of advocates who are experts and less so for non-expert peers. Notably, this does not mean that experts must radically transform every aspect of their lives overnight to be effective. In fact, our work suggests that the advocates with the most exemplary lifestyles do not necessarily fair better (and may even be less effective) than those who take some action. Therefore, it may be helpful for experts to highlight to *some* substantial pro-environmental behaviors that they do. Overall, our findings suggest using an approach that combines advocacy efforts of experts who carefully consider their own sustainability choices, and non-experts, even those who still have a lot of room for improvement, may serve as effective communicators to help society reach its decarbonization goals.

CRedit authorship contribution statement

Gregg Sparkman: Conceptualization, Formal analysis, Writing - original draft. **Shahzeen Z. Attari:** Conceptualization, Data curation, Writing - original draft.

Declaration of Competing Interest

The authors declared no conflicts of interests with respect to the authorship or publication of this article.

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Supplementary materials

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