Pro-environmental behavior as a signal of cooperativeness: Evidence from a social dilemma experiment

Vesely, S.; Klöckner, C.A.; Brick, C.

DOI
10.1016/j.jenvp.2019.101362

Publication date
2020

Document Version
Final published version

Published in
Journal of Environmental Psychology

Journal of Environmental Psychology 67 (2020) 101362

Contents lists available at ScienceDirect

Journal of Environmental Psychology

journal homepage: www.elsevier.com/locate/jep

Pro-environmental behavior as a signal of cooperativeness: Evidence from a social dilemma experiment

Stepan Vesely[a,*], Christian A. Klöckner[a], Cameron Brick[b,c]

[a] Norwegian University of Science and Technology, Norway
[b] Department of Psychology, University of Cambridge, United Kingdom
[c] Department of Psychology, Universiteit van Amsterdam, the Netherlands

ABSTRACT

Pro-environmental behavior has social signaling value. Previous research suggests that enacting pro-environmental behaviors can signal certain personal characteristics, such as social status and trustworthiness, to others. Using an incentivized experiment, we show that people known to behave pro-environmentally are expected to be more cooperative, are preferred as cooperation partners, and elicit more cooperation from others. The presence of pro-environmental individuals may thus motivate others to exert more effort towards reaching cooperative goals, even in situations where individual and group goals are at odds (i.e., social dilemmas). However, people who behaved pro-environmentally were actually no more cooperative than those performing fewer pro-environmental behaviors.

1. Introduction

Climate change mitigation and many of the associated pro-environmental behaviors such as reducing air travel and meat consumption (Dietz, Gardner, Gilligan, Stern, & Vandenbergh, 2009) have become contentious and polarizing subjects in the public discourse (McCright & Dunlap, 2011). As a consequence, people may be reluctant to display or advocate mitigation actions in order to avoid conflict, social sanctions and being perceived negatively by others (cf. Bashir, Lockwood, Chasteen, Nadolny, & Noyes, 2013; Brick, Sherman, & Kim, 2017). Also, people may sort into social relationships with those sharing similar views regarding climate protection, which would allow them to exhibit (or not) pro-environmental behaviors more freely, but this assortative matching could lead to even greater opinion polarization in the long term (Böhm, Pfister, Salway, & Fløttum, 2019).

One good strategy on how to start gaining more insight into the processes sketched in the previous paragraph is to examine how people behaving pro-environmentally (henceforth referred to as "environmentalists" for short) are perceived by others, and whether such perceptions can have real consequences in terms of subsequent social interaction.

There is now a small but growing literature addressing the complex question of how environmentalists are perceived. What previous research shows is that pro-environmental behaviors and attitudes may be able to convey information about a person's social status (Brooks & Wilson, 2015; Puska, Kurki, Lähdesmäki, Siltaoja, & Luomala, 2016; Sadalla & Krull, 1995; Skippon, Kinnear, Lloyd, & Stannard, 2016; but see; Berger, 2017; Welte & Anastasio, 2010), trustworthiness (Fehrler & Kosfeld, 2013; but see Berger, 2017; Puska et al., 2016), and certain personality traits like conscientiousness, agreeableness, and altruism (Puska et al., 2016; Skippon et al., 2016; Skippon & Garwood, 2011). While existing research shows much promise, it has at least two limitations the present work attempts to address. First, we study not only whether behaving pro-environmentally shapes others' perceptions of the actor, but also whether it can have an impact on subsequent social interaction. Second, we study whether people take others' environmentalism into account when making decisions with real (financial) stakes on the line, as opposed to hypothetical decisions or survey responses (cf. Camerer & Hogarth, 1999; Klein, Hilbig, & Heck, 2017; Kormos & Gifford, 2014; Vesely & Klöckner, 2018a).

We extend the literature on the signaling function of environmentalism by testing whether pro-environmental behavior is perceived by others to signal cooperativeness, and by studying how people respond to such a signal. We also explore whether environmentalists behave more cooperatively themselves. Pro-environmental behavior can thus be linked to a key domain of social interaction (cooperation) through its function as a social signal. In this view, environmentally relevant decisions are not made in isolation from the broader social context, but drive and are driven by social influence processes.

People may sometimes refrain from behaving pro-environmentally if they think this could harm their social image (Brick et al., 2017). However, if pro-environmental behavior can serve as a reliable signal of cooperativeness, applied research could then build on this finding to facilitate pro-environmental behavior. Specifically, environmentalists' greater perceived cooperativeness and others' greater willingness to

* Corresponding author.
E-mail addresses: stepan.vesely@ntnu.no (S. Vesely), christian.klockner@ntnu.no (C.A. Klöckner), cb954@cam.ac.uk (C. Brick).

https://doi.org/10.1016/j.jenvp.2019.101362
Received 16 July 2019; Received in revised form 7 October 2019; Accepted 9 October 2019
Available online 18 October 2019

cooperate with them could be leveraged as a co-benefit of and further motivation for behaving pro-environmentally. This possibility echoes what has been suggested by Keohane and Victor (2016) in the context of climate change mitigation negotiations: that countries may contribute to climate change mitigation to build their reputation and to secure future cooperation from others (see also Bain et al., 2016; Brekke & Nyborg, 2008). Thus, if pro-environmental behavior is able to signal cooperative tendencies, this can have important practical implications.

Before proceeding to our hypotheses, we shall provide a brief outline of their key theoretical underpinnings. We study cooperation using a standard social dilemma setting (the public goods game) where the group's material welfare is maximized by joint cooperation by everyone in the group, but at the same time an individual is materially better off not cooperating regardless of what the other group members do (Andreoni, 1988; Dawes, 1980). What motivates our prediction that people engaging in pro-environmental behavior are also more cooperative (see H4 below) is that both cooperative and pro-environmental behaviors are driven by pro-social preferences, such as inequity aversion and norm compliance in case of cooperation (Fehr & Schmidt, 1999; Kimbrough & Vostroknutov, 2016; Krupka & Weber, 2013) and attitudes, values, and norms in case of pro-environmental behavior (Bamberg & Möser, 2007; Klöckner, 2013). We specifically propose that pro-environmental and cooperative behaviors may be linked by virtue of their underlying pro-social motives being correlated within individuals. This is consistent with previous research linking cooperation to pro-environmental behaviors and attitudes (Kaiser & Byrka, 2011; Sussman, Lavallee, & Gifford, 2016; Tarditi, Hahnel, Jeanmonod, Sander, & Brosch, 2018; but see Smith & Bell, 1992), as well as with research on associations between different pro-social motives more generally (Bamberg & Möser, 2007; Gächter, Nosenzo, & Sefton, 2013; Kimbrough & Vostroknutov, 2016; Klöckner, 2013). We next propose that if environmentally-friendly individuals are indeed more cooperative outside the lab, observers will have formed a mental association between environmentalism and cooperation through experience (see H1). Because in social dilemmas, interaction with cooperators rather than free-riders is by design more advantageous (see section 2.3.1 and Andreoni, 1988), we expect that environmentalists, if perceived to be cooperative, will be preferred as cooperation partners (see H2). Finally, provided that environmentalists are believed to be cooperative, others should cooperate with them (see H3) due to well-established reciprocity and inequity aversion motives (Fehr & Schmidt, 1999).

Hypotheses. H1: Individuals will expect those who perform more pro-environmental behaviors to be more cooperative in social dilemmas. H2: People who perform more pro-environmental behaviors will be preferred as cooperation partners in social dilemmas. H3: People who perform relatively more pro-environmental behaviors will elicit more cooperation from others. H4: People who perform relatively more pro-environmental behaviors will be more cooperative in social dilemmas.

To test our hypotheses, we invited participants to play four public goods games in the laboratory, select their preferred game partners, and respond to questionnaires, as detailed below.

2. Method

2.1. Participants and sessions

Two hundred and eight participants (111 females; mean age = 23.94 years, SD = 5.45) recruited from a subject pool maintained by the Vienna Center for Experimental Economics (VCEE) took part in the study. A priori power calculations indicated that a sample of at least 191 participants was required to detect a small effect (partial R^2 = 0.04) with alpha at .05 (two-tailed) and statistical power at .80 (Faul, Erdfelder, Lang, & Buchner, 2007). ORSEE (Greiner, 2015) was used for recruitment and z-Tree (Fischbacher, 2007) for programming. Participants were compensated for their time, mean earnings = 35.3 EUR (including payment for additional unrelated tasks, see section B5 in Appendix B). The design was independently reviewed and approved by VCEE staff, in accordance with University of Vienna regulations.

2.2. Questionnaire

Participants responded to 28 questions about their previous pro-environmental behaviors (most of the items were adapted from Kaiser, 1998; see Appendix D). We calculated the total score for each participant, with higher scores indicating enactment of more pro-environmental behaviors (M = 18.03, SD = 3.77, α = 0.70). Participants also answered socio-demographic questions.

We then elicited participants' risk preferences, using a task adapted from Eckel and Grossman (2002). This served as a filler task obscuring the link between the environmental behavior questionnaire and the social dilemma games. Importantly, we later gave participants the opportunity to condition their selection of partners in one of the social dilemma games on the potential partner's risk preferences (see section 2.5).

2.3. Public goods games

Participants played four standard one-shot linear public goods games (Andreoni, 1988) without feedback. In each game, participants formed anonymous groups of four. In each game, each participant was endowed with 20 tokens and had to decide how to distribute the tokens between a Group project and an Individual project. One token invested in the Individual project would yield one point to the investor and zero points to the other three group members. One token invested in the Group project would yield 0.5 points to all four group members. Thus, investing in the Group project (cooperation) maximized the group's material welfare, while investing in the Individual project yielded higher material utility to the individual. At the end of the experiment, one of the four games was randomly selected for payment with an exchange rate 10 points = 2 EUR.

2.3.1. Group matching (treatments)

In the "Most Environmental Game" condition, participants were informed they would be matched with the three most pro-environmental participants in the session (excluding themselves) based on the pre-experimental questionnaire. In "Least Environmental Game", participants were informed they would be matched with the three least pro-environmental participants in the session. In "Average Environmental Game", participants were informed they would be matched with the three participants in the session that were closest to that session's mean environmentalism score. In "Random Matching Game", participants were informed they would be matched into groups randomly. The order of the four games was randomized across participants.

2.4. Belief elicitation

After each game, participants guessed how many tokens others in their matching group contributed to the Group project in total in that game. Participants were given a 2 EUR bonus for guessing others' total contribution correctly within ± 3 tokens.

2.5. Partner selection

Participants next proceeded to play three repeated public goods games as a part of an unrelated study. Important for the present study, they were given an opportunity to select their preferred partners for one of these games from among other participants in the session. Specifically, each participant was shown a table listing all other participants in the session in random order, with the following information displayed in three columns: each participant's environmental score, risk seeking score and age. The order in which the three types of scores were displayed in the columns was randomized across participants. Thus,

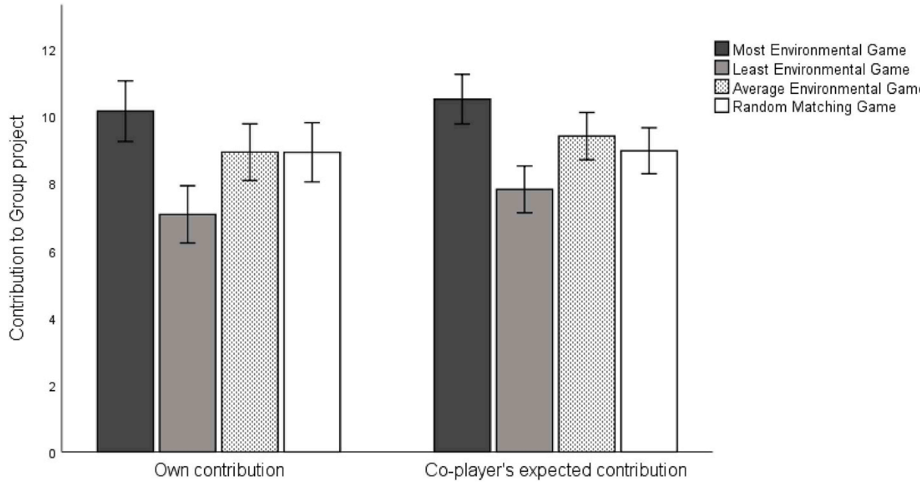

Fig. 1. Own actual and co-player's expected contributions (means and 95% CIs; maximum possible contribution per game was 20 tokens).

participants were able to condition their choice of partners on two additional plausible criteria besides environmental score (i.e., others' risk preferences and age, see Kocher, Martinsson, Matzat, & Wollbrant, 2015; Thöni, Tyran, & Wengström, 2012). Participants could then indicate on a 7-point scale whether they would like to be matched with each of the other participants present. Participants knew that their stated preferences would with some probability determine with whom they would be matched (see Appendix B).

3. Results

Fig. 1 displays participants' contributions to the Group project in the four games and their beliefs of how much a co-player in their matching group contributed.

In Table 1, we report estimates of two regression models testing H1. In Model 1, we regressed participants' expectations of how much others in their matching group contributed to the Group project on matching group type dummies, with "Average Environmental Game" serving as the baseline category. Model 2 is the same as Model 1, but "Random Matching Game" serves as the baseline category. All reported tests are two-sided.

We found clear support for H1: Environmentalists were believed to be more cooperative. Specifically, compared to either control group (Average Environmental Game or Random Matching Game), participants expected co-players who were known to perform the most pro-environmental behaviors in one's session to contribute more to the Group project, while the reverse was true for co-players who were known to perform the fewest pro-environmental behaviors.

The test of H2 is presented in Table 2. As described in section 2.5, for every individual in a session, each participant indicated whether they preferred to be matched with them on a 7-point scale. For every individual we averaged the preference ratings received from others.

Table 2
Regression of received preference ratings on players' characteristics.

	b (95% CI)
Environmental score	0.07 (0.06, 0.08)***
Risk score	0.00 (−0.01, 0.01)
Age score	0.00 (−0.01, 0.00)
Constant	3.12 (2.93, 3.31)***
Observations	208
R^2	.51

Notes: ***$p < .001$. Linear regression with robust standard errors.

Everyone was thus assigned a "mean preference rating". Higher values indicated that others wanted to be matched with this person, and lower values indicated that others preferred not to be matched with this person. In Table 2, we regressed participants' mean preference rating on their environmental score, risk seeking score and age score (i.e., the indicators displayed during the rating exercise). We found strong support for H2: Participants preferred to be matched with others who performed many pro-environmental behaviors. Age and risk preferences had no effect on being preferred as cooperation partner.

Table 3 presents estimates of two regression models simultaneously testing H3 and H4. In Model 3, we regressed participants' contributions to the Group project on their environmental score (to test H4) and on matching group type dummies (to test H3), with Average Environmental Game serving as the control group. Model 4 is the same as Model 3, but Random Matching Game serves as control.

We found clear support for H3: Environmentalists elicited more cooperation from others. Specifically, compared to either control group, participants contributed more to the Group project when matched with

Table 1
Regression of expected contributions on group type.

	Model 1 – Average Environmental Game used as baseline	Model 2 – Random Matching Game used as baseline
	b (95% CI)	b (95% CI)
Most Environmental Game	1.10 (0.62, 1.59)***	1.54 (1.01, 2.07)***
Least Environmental Game	−1.59 (−2.09, −1.08)***	−1.15 (−1.67, −0.63)***
Average Environmental Game		0.43 (−0.01, 0.88)
Random Matching Game	−0.43 (−0.88, 0.01)	
Constant	9.41 (8.71, 10.12)***	8.98 (8.29, 9.66)***
Observations	832	832
No. of clusters	208	208
R^2	.03	.03

Notes: ***$p < .001$. Estimation method is robust linear regression with standard errors clustered at the subject level.

Table 3
Regression of contributions on environmental score and group type.

	Model 3 – Average Environmental Game used as baseline	Model 4 – Random Matching Game used as baseline
	b (95% CI)	*b* (95% CI)
Most Environmental Game	1.22 (0.58, 1.86)***	1.23 (0.64, 1.81)***
Least Environmental Game	−1.86 (−2.46, −1.25)***	−1.85 (−2.61, −1.09)***
Average Environmental Game		0.00 (−0.57, 0.58)
Random Matching Game	−0.00 (−0.58, 0.57)	
Environmental score	0.11 (−0.09, 0.30)	0.11 (−0.09, 0.30)
Constant	7.00 (3.33, 10.68)***	7.00 (3.32, 10.68)***
Observations	832	832
No. of clusters	208	208
R^2	.03	.03

Notes: ***$p < .001$. Robust linear regression with standard errors clustered at the subject level.

co-players who were known to perform the most pro-environmental behaviors in one's session, while they contributed less to the Group project when matched with co-players who were known to perform the fewest pro-environmental behaviors. Hypothesis H4 was not supported: Those who reported performing more pro-environmental behaviors did not cooperate more than those performing fewer pro-environmental behaviors.

4. Discussion and conclusions

In this paper we focused on the signaling value of pro-environmental behavior and specifically on its ability to signal cooperative tendencies. We posited that pro-environmental behavior can serve as a signal of cooperation (H1), and that others would act on this signal (H2, H3), and we also proposed that environmentalists would themselves be more cooperative (H4). As predicted, environmentalists were perceived as more cooperative in the social dilemma setting (H1), they were sought after as cooperation partners (H2), and they elicited more cooperation from others (H3). Unexpectedly, environmentalists were not more cooperative compared to those performing fewer pro-environmental behaviors (H4). These findings contribute to the literature on the signaling value of environmentalism (e.g., Berger, 2017; Brick et al., 2017; Griskevicius, Tybur, & Van den Bergh, 2010) by showing that environmental behaviors signal a cooperative disposition and that others act on this signal in situations with real consequences.

An important implication of our results is that being seen as an environmentalist confers personal side-benefits to environmentalists, as others are more cooperative towards such individuals, and more willing to establish interactions with them (a form of social capital, see Cinyabuguma, Page, & Putterman, 2005). Such side-benefits could be leveraged by policy-makers to promote further pro-environmental action (Bain et al., 2016; Griskevicius et al., 2010; Keohane & Victor, 2016).

Environmentalists, however, do not appear to fulfill others' expectations of being more cooperative themselves (see H4). Subsequent research should therefore explore how to motivate environmentalists to meet others' initial positive expectations (see e.g. Bellemare, Sebald, & Suetens, 2018). Otherwise, cooperation is likely to break down in repeated encounters when initial positive expectations are not met (Fischbacher & Gächter, 2010). A possible explanation for failing to support H4 could be that cooperative decisions were made anonymously in our experiment, while past cooperative decisions involved in expectation formation had to be publicly observable. Decision observability promotes pro-social behavior (Bradley, Lawrence, & Ferguson, 2018), which may help explain why anonymous decisions deviate from others' expectations. An intriguing hypothesis consistent with our data is that environmentalists are particularly sensitive to being publicly observed. This suggests possible extensions of the present study, linking it to research on the role that decision observability plays in environmental behavior (Brick et al., 2017; Griskevicius et al., 2010; Vesely & Klöckner, 2018b).

A limitation of our study is that environmental behaviors were self-reported, rather than objectively measured (Kormos & Gifford, 2014; Lange & Dewitte, 2019). Another limitation is that we relied on a single decision paradigm, the "give some" public goods game, and replications using other types of social dilemmas could point to possible boundary conditions of the reported effects. There are for example subtle behavioral differences between "give some" and "take some" social dilemmas (Fosgaard, Hansen, & Wengström, 2014). One could speculate that different types of pro-environmental behavior (e.g., investment vs. curtailment) could be better able to signal cooperativeness in specific types of dilemmas (such as the give some vs. take some dilemmas). Another limitation is that only two "distractor" characteristics (age and risk preferences) were used along with environmentalism to inform participants about their potential cooperation partners. Finally, we cannot altogether rule out experimenter demand, as information about others' pro-environmental behavior was somewhat prominent in the decision tasks and some participants may have felt compelled to react to it for this reason.

Acknowledgement

We thank the Vienna Center of Experimental Economics (VCEE), University of Vienna, for allowing us to run our experiment in their laboratory. We are in particular grateful to Philipp Külpmann and Réka Szendrő for organizing the data collection.

Appendices. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jenvp.2019.101362.

References

Andreoni, J. (1988). Why free ride? Strategies and learning in public goods experiments. *Journal of Public Economics, 37*, 291–304.
Bain, P. G., Milfont, T. L., Kashima, Y., Bilewicz, M., Doron, G., Garðarsdóttir, R. B., et al. (2016). Co-benefits of addressing climate change can motivate action around the world. *Nature Climate Change, 6*, 154–157.
Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology, 27*, 14–25.
Bashir, N. Y., Lockwood, P., Chasteen, A. L., Nadolny, D., & Noyes, I. (2013). The ironic impact of activists: Negative stereotypes reduce social change influence. *European Journal of Social Psychology, 43*, 614–626.
Bellemare, C., Sebald, A., & Suetens, S. (2018). Heterogeneous guilt sensitivities and incentive effects. *Experimental Economics, 21*, 316–336.
Berger, J. (2017). Are luxury brand labels and "green" labels costly signals of social status? An extended replication. *PLoS One, 12*, e0170216.
Böhm, G., Pfister, H.-R., Salway, A., & Fløttum, K. (2019). Remembering and communicating climate change narratives: The influence of world views on selective recollection. *Frontiers in Psychology, 10* article 1026.
Bradley, A., Lawrence, C., & Ferguson, E. (2018). Does observability affect prosociality? *Proceedings of the Royal Society B: Biological Sciences, 285*, 20180116. https://doi.org/10.1098/rspb.2018.0116.
Brekke, K. A., & Nyborg, K. (2008). Attracting responsible employees: Green production

as labor market screening. *Resource and Energy Economics, 30*, 509–526.
Brick, C., Sherman, D. K., & Kim, H. S. (2017). “Green to be seen” and “brown to keep down”: Visibility moderates the effect of identity on pro-environmental behavior. *Journal of Environmental Psychology, 51*, 226–238.
Brooks, J. S., & Wilson, C. (2015). The influence of contextual cues on the perceived status of consumption-reducing behavior. *Ecological Economics, 117*, 108–117.
Camerer, C., & Hogarth, R. M. (1999). The effects of financial incentives in experiments: A review and capital-labor-production framework. *Journal of Risk and Uncertainty, 19*, 7–42.
Cinyabuguma, M., Page, T., & Putterman, L. (2005). Cooperation under the threat of expulsion in a public goods experiment. *Journal of Public Economics, 89*, 1421–1435.
Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology, 31*, 169–193.
Dietz, T., Gardner, G. T., Gilligan, J., Stern, P. C., & Vandenbergh, M. P. (2009). Household actions can provide a behavioral wedge to rapidly reduce US carbon emissions. *Proceedings of the National Academy of Sciences, 106*, 18452–18456.
Eckel, C., & Grossman, P. J. (2002). Sex differences and statistical stereotyping in attitudes toward financial risk. *Evolution and Human Behavior, 23*, 281–295.
Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175–191.
Fehr, E., & Schmidt, K. M. (1999). A theory of fairness, competition, and cooperation. *Quarterly Journal of Economics, 114*, 817–868.
Fehrler, S., & Kosfeld, M. (2013). Can you trust the good guys? Trust within and between groups with different missions. *Economics Letters, 121*, 400–404.
Fischbacher, U. (2007). z-Tree: Zurich toolbox for ready-made economic experiments. *Experimental Economics, 10*, 171–178.
Fischbacher, U., & Gächter, S. (2010). Social preferences, beliefs, and the dynamics of free riding in public good experiments. *The American Economic Review, 100*, 541–556.
Fosgaard, T. R., Hansen, L. G., & Wengström, E. (2014). Understanding the nature of cooperation variability. *Journal of Public Economics, 120*, 134–143.
Gächter, S., Nosenzo, D., & Sefton, M. (2013). Peer effects in pro-social behavior: Social norms or social preferences? *Journal of the European Economic Association, 11*, 548–573.
Greiner, B. (2015). Subject pool recruitment procedures: Organizing experiments with ORSEE. *Journal of the Economic Science Association, 1*, 114–125.
Griskevicius, V., Tybur, J. M., & Van den Bergh, B. (2010). Going green to be seen: Status, reputation, and conspicuous conservation. *Journal of Personality and Social Psychology, 98*, 392–404.
Kaiser, F. G. (1998). A general measure of ecological behavior. *Journal of Applied Social Psychology, 28*, 395–422.
Kaiser, F. G., & Byrka, K. (2011). Environmentalism as a trait: Gauging people's prosocial personality in terms of environmental engagement. *International Journal of Psychology, 46*, 71–79.
Keohane, R. O., & Victor, D. G. (2016). Cooperation and discord in global climate policy. *Nature Climate Change, 6*, 570–575.
Kimbrough, E. O., & Vostroknutov, A. (2016). Norms make preferences social. *Journal of the European Economic Association, 14*, 603–638.
Klein, S. A., Hilbig, B. E., & Heck, D. W. (2017). Which is the greater good? A social dilemma paradigm disentangling environmentalism and cooperation. *Journal of Environmental Psychology, 53*, 40–49.
Klöckner, C. A. (2013). A comprehensive model of the psychology of environmental behavior: A meta-analysis. *Global Environmental Change, 23*, 1028–1038.
Kocher, M. G., Martinsson, P., Matzat, D., & Wollbrant, C. (2015). The role of beliefs, trust, and risk in contributions to a public good. *Journal of Economic Psychology, 51*, 236–244.
Kormos, C., & Gifford, R. (2014). The validity of self-report measures of proenvironmental behavior: A meta-analytic review. *Journal of Environmental Psychology, 40*, 359–371.
Krupka, E. L., & Weber, R. A. (2013). Identifying social norms using coordination games: Why does dictator game sharing vary? *Journal of the European Economic Association, 11*, 495–524.
Lange, F., & Dewitte, S. (2019). Measuring pro-environmental behavior: Review and recommendations. *Journal of Environmental Psychology, 63*, 92–100.
McCright, A. M., & Dunlap, R. E. (2011). The politicization of climate change and polarization in the American public's views of global warming, 2001-2010. *The Sociological Quarterly, 52*, 155–194.
Puska, P., Kurki, S., Lähdesmäki, M., Siltaoja, M., & Luomala, H. (2016). Male-male status signaling through favoring organic foods: Is the signaler perceived and treated as a friend or a foe? *Psychology and Marketing, 33*, 843–855.
Sadalla, E. K., & Krull, J. L. (1995). Self-presentational barriers to resource conservation. *Environment and Behavior, 27*, 328–353.
Skippon, S., & Garwood, M. (2011). Responses to battery electric vehicles: UK consumer attitudes and attributions of symbolic meaning following direct experience to reduce psychological distance. *Transportation Research Part D, 16*, 525–531.
Skippon, S. M., Kinnear, N., Lloyd, L., & Stannard, J. (2016). How experience of use influences mass-market drivers' willingness to consider a battery electric vehicle: A randomised controlled trial. *Transportation Research Part A, 92*, 26–42.
Smith, J. M., & Bell, P. A. (1992). Environmental concern and cooperative-competitive behavior in a simulated commons dilemma. *The Journal of Social Psychology, 132*, 461–468.
Sussman, R., Lavallee, L. F., & Gifford, R. (2016). Pro-environmental values matter in competitive but not cooperative commons dilemmas. *The Journal of Social Psychology, 156*, 43–55.
Tarditi, C., Hahnel, U. J. J., Jeanmonod, N., Sander, D., & Brosch, T. (2018). Affective dilemmas: The impact of trait affect and state emotion on sustainable consumption decisions in a social dilemma task. *Environment and Behavior*.
Thöni, C., Tyran, J.-R., & Wengström, E. (2012). Microfoundations of social capital. *Journal of Public Economics, 96*, 635–643.
Vesely, S., & Klöckner, C. A. (2018a). Global social norms and environmental behavior. *Environment and Behavior, 50*, 247–272.
Vesely, S., & Klöckner, C. A. (2018b). How anonymity and norms influence costly support for environmental causes. *Journal of Environmental Psychology, 58*, 27–30.
Welte, T. H. L., & Anastasio, P. A. (2010). To conserve or not to conserve: Is status the question? *Environment and Behavior, 42*, 845–863.