



ELSEVIER

Engineering social change using social norms: lessons from the study of collective action

Deborah Prentice and Elizabeth Levy Paluck

Behavioral interventions have embraced social norms as information that can be communicated in simple messages to motivate behavior change. This article argues for the value and necessity of recognizing that social-norm interventions are grounded in group processes. This approach has three major benefits that more than offset the costs of its greater theoretical and practical complexity. One, it improves the effectiveness of existing interventions, including those that target the normative beliefs of individuals. Two, it opens up new intervention strategies that broaden the range of mechanisms used to change behavior. Three, it connects research on social-norm interventions with theories and research on rallies, rebellions, riots, and other forms of collective action.

Address

Peretsman Scully Hall, Princeton University, Princeton, NJ, USA

Corresponding author: Prentice, Deborah (predebb@princeton.edu)

Current Opinion in Psychology 2020, **35**:138–142

This review comes from a themed issue on **Social change (rallies, riots and revolutions)** (2020)

Edited by **Séamus A Power**

For a complete overview see the [Issue](#) and the [Editorial](#)

Available online 1st July 2020

<https://doi.org/10.1016/j.copsyc.2020.06.012>

2352-250X/© 2020 Elsevier Ltd. All rights reserved.

Social psychology has produced two distinct bodies of research on social change, one focused on the determinants of collective action [1] and the other on interventions to produce behavior change [2]. These bodies of research grew out of overlapping theoretical traditions in the mid-20th century, but they have grown increasingly distinct, with divergent assumptions, epistemologies, and methodological approaches. Like distant branches of the same family tree, they do not interact much nor do they always recognize each other as kindred. However, these two research traditions share powerful common goals, chief among them the goal of using psychological insights to facilitate social reform. Thus, both traditions have much to gain from recognizing their common ground and potential complementarities.

In this essay, we consider what behavior-change interventions have to gain from a stronger connection to the study of collective action. We focus, in particular, on interventions that target social norms, since these interventions are both widespread and ripe for a more collective approach. We argue that these interventions rely, for their effectiveness, on the very same group processes that underlie rallies, riots, and other efforts at social change. Understanding engineered social change as a variant of other organized social change opens up new possibilities for intervention strategies and also highlights the importance of considering the broader context when evaluating whether a particular intervention will be effective or not.

Social-norm interventions

Providing people with information about the opinions and behaviors of others is what is currently known as the social norms approach to behavioral intervention [3]. In the simplest form of this idea, a social-norm intervention informs individuals of what others are doing or what others approve of, in order to encourage them to do the same. This strategy has dominated recent social-scientific approaches to engineering social change. How can we fight climate change? Mobilize conformity [4,5]. Reduce sexual assault? Conformity is the answer [6–8]. Increase transparency and reduce corruption and graft? Conformity again is the solution [9,10].

Robert Cialdini's research, prominently featured in the recent wave of applied behavioral science perspectives and interventions [11,12] has carried the psychological lesson of social norms and conformity from psychology to other disciplines and to policy and social change organizations [13*,14,15,16*]. The idea that has perhaps carried the farthest is the idea of social proof: that an individual will determine appropriate behavior for themselves in a situation [by examining] the behavior of others there, especially similar others [17]. The idea goes beyond simple mimicry. For example, evidence that other hotel guests reuse the towels in their rooms does not automatically engender reuse; reuse depends on who those other hotel guests are and what their behavior indicates about the norms for appropriate behavior in the context [18,19].

The notion of social proof conveys a deeper truth about norms—norms are not static statistics about groups that individuals carry around in their head but instead hypotheses repeatedly tested against observations. Hotel residents observe whether their roommate hangs up the

towel after showering; they notice whether piles of used towels are being carted out of other rooms on the house-keeping cart; they may even strike up a conversation with a friend or colleague staying at the hotel about whether they too reuse towels. They use this social information to update their perception of the norm for towel reuse. In short, social proof is not a single act, but rather an ongoing, dynamic process, guided by the behaviors and opinions people observe and generate within their social groups [20**].

In the past decade as social-norm interventions have increased in popularity [21], it has grown rare to observe psychological insights about group processes translated into intervention protocols. Instead, most have used marketing strategies to change an individual's beliefs about a group norm [22–24]. Recent examples include providing college women with information via the web about how frequently their peers hook up [25], and posting signs at hospital entrances showing the percentage of visitors who prefer a smoke-free environment [26]. Although these interventions are animated by the goal of producing broader social change, they seek to produce it individual by individual. They do not mobilize or even account for the dynamic processes of social reality-testing and norm updating that are necessary to produce social change.

In addition, social-norm interventions have moved increasingly in the direction of personalization of the normative information—giving examples of other people or households who are just like you [27,28]. Personalization of normative information flows from the good insight of social proof—naturally, people look toward the behavior of friends and others like them in their groups as a social guide. But personalization and individualized approaches to normative interventions may go too far, given that individuals process social norm information as part of a dynamic group environment. Through reality testing, people look to the verbal and nonverbal behaviors of a variety of group members and ask—is this message true? Do I see this occurring in real life?

Recovering the collective basis of social norms

Research on social norms originated in the study of group processes. In some of the earliest studies, Solomon Asch [29,30] and Muzafer and Carolyn Sherif [31], explored how the most basic psychological processes, including vision and perception, can be affected by peers' judgments. Out of this work, the Sherifs developed the idea of a reference group, the group whose opinions and behaviors matter, the one that serves as the source of social proof. Asch's work showed the many occasions in which social proof did *not* work to change someone's judgment. For example, conformity depended not just on the

number of people who conformed, but also on how the group expressed judgement and the extent of its homogeneity.

The foundational work of Asch and the Sherifs has given rise to a large, well-developed literature on social norms and their role in facilitating and inhibiting social change [32,33]. At the same time, the toolbox available to those wishing to use social norms in behavioral interventions has not developed apace. Simple, individually tailored messages containing normative information remain the dominant approach. We see this as a missed opportunity. Again, social norms are not static beliefs, but rather an integral component of ongoing group processes. Understanding these processes can enable the development of interventions to strengthen, weaken, broaden, narrow, and diffuse norms to new groups, all with predictable effects on behavior. Consider the following strategies.

Targeting social referents

One strategy is to target an intervention to those individuals who are most influential within the group, the social referents to whom others look to determine the group norm. If an intervention can change the opinions and behaviors of the social referents, it will change other group members' perceptions of the whole group. Paluck *et al.* [34] employed this strategy in their intervention to reduce conflict among high school students. They used network analysis to identify and target students who were given the most attention in each school's social network and then intervened with these social referents to reduce their conflict behaviors and to publicize anti-conflict opinions. If social referents' behavior is overweighted in students' everyday process of observing peer behavior and updating impressions of social norms, then this intervention should cause school social norms to be less tolerant of conflict, with attendant effects on behavior. The results bore out this logic. By behaving in opposition to conflict, social referents were able to change other students' ideas about norms of conflict at the school, resulting in a lower incidence of behavioral conflict according to school administrative records.

This strategy of targeting an intervention to social referents has widespread applicability. For example, consider the recent finding that consensus information—statements about what people in general or everybody thinks and feels—has more influence on social norms when it comes from weak ties (distant friends and acquaintances) than from strong ties (close friends and family members) [35]. This finding suggests the potential effectiveness of an intervention aimed at changing the consensus beliefs of those on the periphery of a social network. Consider also the finding that, in organizational contexts, people look to the bottom of the status hierarchy, rather than the top, for information about social norms [36]. This finding suggests that it might be more effective for an

intervention designed to change organizational culture to start at the bottom, rather than the top, of the organization.

Weakening the social norm

A second strategy is to intervene to weaken, rather than strengthen, the social norm. Often, entrenched norms are an obstacle to social change; they keep opinions and behaviors in place even if individuals no longer privately support them, a phenomenon known as pluralistic ignorance [37]. In these cases, an intervention that leverages social reality-testing to reveal the weakness of the norm can facilitate social change. Schroeder and Prentice [38] employed this strategy in their intervention to reduce alcohol use by college students. The intervention took as its starting point survey evidence for pluralistic ignorance: strong social norms promoting excessive alcohol consumption on campus and substantial misgivings about excessive drinking expressed by the majority of students. Schroeder and Prentice's intervention convened group discussions to give students the opportunity to talk about campus drinking norms, to express their views about excessive alcohol consumption, and to hear the views of their peers. That is, it created a context in which social reality-testing would reveal to students that the norm lacked private support. If the group discussion punctured the illusion that the pro-drinking norm had universal support on campus, then this intervention should reduce excessive drinking. The results provided support for this mechanism: The intervention was especially effective at reducing excessive alcohol consumption among students high in vulnerability to social influence, suggesting that the discussions worked by reducing the strength of campus drinking norms.

This strategy of co-opting social reality-testing in a group setting to weaken the social norm also has widespread applicability. Indeed, it can be used whenever beliefs and opinions are characterized by pluralistic ignorance. Although pluralistic ignorance is perhaps most familiar in the context of adolescent health-related behaviors [39,40], recent research has focused on the prevalence of pluralistic ignorance in beliefs about climate and environmental policy [41,42] as well as sex roles, especially for men [43,44]. These domains are all ripe for a norm-weakening intervention.

When social norm messaging works

We have argued that social-norm interventions should take account of group processes, and in particular, the social reality-testing process that gives rise to perceptions of the social norm. Critics might respond to this argument by pointing to notable cases in which interventions that employ simple, social-norm messaging have had widespread and durable effects without taking any account of group processes. Perhaps the best-known example of such an intervention comes from the use of home energy

reports to reduce energy consumption [45,46*]. Home energy reports provide residential customers of utility companies with individualized feedback about how their energy consumption compares with that of similarly situated neighbors. Interventions using this strategy have enjoyed considerable success: the reports lead to an immediate reduction in energy use, which becomes more stable over time and persists even when the reports are discontinued [47,48]. Does this example run counter to our claim that group processes are critical for the operation of social norms? We would argue that it is an exception that proves the rule. Household energy use is one domain in which social reality testing is nearly impossible. People have scant insight into their own energy consumption (unless they have been reading their home energy reports) and no access to information about energy consumption in other households. Indeed, it is precisely because of this lack of information that the home energy reports have the impact they do.

Conclusion

We have argued for the value and necessity of considering group processes when designing behavioral interventions that target social norms. This approach to social norms has at least three major benefits that, in our view, more than offset the costs of its greater theoretical and practical complexity. One, attention to group processes will improve the effectiveness of existing interventions, including those that target the normative beliefs of individuals. Two, the development of interventions that target group processes will open up many new approaches to leveraging social norms to change behavior. The foregoing discussion has highlighted both of these benefits.

Finally, embedding social-norm interventions in the context of group processes connects the work we have described with the rallies, rebellions, and revolutions that are at the heart of this issue of *Current Directions in Psychology*. On the surface, the nudge-inspired social engineering that produced the Home Energy Report would seem to have little in common with Black Lives Matter, #MeToo, and the other social movements that have engaged in collective action to produce social change. However, these divergent approaches need each other to achieve long-term, enduring social change. Social engineering works best when it is targeted and timely; and the gains of protests and demonstrations endure only if they translate into new norms to guide behavior. Both sides of this equation are informed by an understanding of how individuals function as members of groups: when they acquiesce to social norms (even social norms they do not support) and when they resist or, in some cases, conform to resistance [49,50*]. Proceeding from that common ground promises to maximize the social change these approaches, in combination, can achieve.

Credit

Both authors conceived the argument and wrote the manuscript.

Conflict of interest statement

Nothing declared.

References and recommended reading

Papers of particular interest, published within the period of review, have been highlighted as:

- of special interest
 - of outstanding interest
1. van Zomeren M, Kutlaca M, Turner-Zwinkels F: **Integrating who 'we' are with what 'we' (will not) stand for: a further extension of the Social Identity Model of Collective Action.** *Eur Rev Soc Psychol* 2018, **29**:122-160 <http://dx.doi.org/10.1080/10463283.2018.1479347>.
 2. Walton GM, Wilson TD: **Wise interventions: psychological remedies for social and personal problems.** *Psychol Rev* 2018, **125**:617-655 <http://dx.doi.org/10.1037/rev0000115>.
 3. Miller DT, Prentice DA: **Changing norms to change behavior.** *Annu Rev Psychol* 2016, **67**:339-361 <http://dx.doi.org/10.1146/annurev-psych-010814-015013>.
 4. Farrow K, Grolleau G, Ibanez L: **Social norms and pro-environmental behavior: a review of the evidence.** *Ecol Econ* 2017, **140**:1-13 <http://dx.doi.org/10.1016/j.ecolecon.2017.04.017>.
 5. Lede E, Meleady R, Seger CR: **Optimizing the influence of social norms interventions: applying social identity insights to motivate residential water conservation.** *J Environ Psychol* 2019, **62**:105-114 <http://dx.doi.org/10.1016/j.jenvp.2019.02.011>.
 6. Clark CJ, Ferguson G, Shrestha B, Shrestha PN, Oakes JM, Gupta J, McGhee S, Cheong YF, Yount KM: **Social norms and women's risk of intimate partner violence in Nepal.** *Soc Sci Med* 2018, **202**:162-169 <http://dx.doi.org/10.1016/j.socscimed.2018.02.017>.
 7. Lemay EP, O'Brien KM, Kearney MS, Sauber EW, Venaglia RB: **Using conformity to enhance willingness to intervene in dating violence: a Theory of Planned Behavior analysis.** *Psychol Violence* 2017, **9**:400-409 <http://dx.doi.org/10.1037/vio0000114>.
 8. Vaitla B, Taylor A, Van Horn J, Cislighi B: **Social Norms and Girls' Well-being: Integrating Theory, Practice, and Research.** Washington, DC: Data2X; 2017.
 9. Hallsworth M, List JA, Metcalfe RD, Vlaev I: **The behavioralist as tax collector: using natural field experiments to enhance tax compliance.** *J Public Econ* 2017, **148**:14-31 <http://dx.doi.org/10.1016/j.jpubeco.2017.02.003>.
 10. John P, Blume T: **How best to nudge taxpayers? The impact of message simplification and descriptive social norms on payment rates in a central London local authority.** *J Behav Public Adm* 2018, **1** <http://dx.doi.org/10.30636/jbpa.11.10>.
 11. Bicchieri C, Dimant E: **Nudging with care: the risks and benefits of social information.** *Public Choice* 2019:1-22 <http://dx.doi.org/10.1007/s11127-019-00684-6>.
 12. Kahneman D: **Foreward.** In *The Behavioral Foundations of Public Policy*. Edited by Shafir E. Princeton University Press; 2012:vii-x. <https://doi.org/10.2307%2Fj.ctv550cbm.3>.
 13. Arias E: **How does media influence social norms? Experimental evidence on the role of common knowledge.** *Political Sci Res Methods* 2019, **7**:561-578 <http://dx.doi.org/10.1017/psrm.2018.1>.
 - 13] Arias E: How does media influence social norms? Experimental evidence on the role of common knowledge. *Political Sci Res Methods* 2019, **7**:561-578 dx.doi.org/10.1017/psrm.2018.1. Results from both a natural experiment and a field experiment in a Mexican community demonstrate that media influence attitudes and social norms by changing higher-order beliefs about others and coordination within the community, rather than through individual persuasion. This research provides an excellent example of how social-norm interventions that target collective mechanisms can produce social change.
 14. Better C, Datta S, Martin J, Silva K: **Concrete Action: Paving Potholes with Behavioral Science.** New York: Ideas42; 2020.
 15. Bursztyn L, González AL, Yanagizawa-Drott D: **Misperceived Social Norms: Female Labor Force Participation in Saudi Arabia.** (No. w24736) National Bureau of Economic Research; 2018 <http://dx.doi.org/10.2139/ssrn.3202392>.
 16. Matias JN: **Preventing harassment and increasing group participation through social norms in 2,190 online science discussions.** *Proc Natl Acad Sci* 2019, **116**:9785-1909789 <http://dx.doi.org/10.1073/pnas.1813486116>.
 - 16] Matias JN: Preventing harassment and increasing group participation through social norms in 2,190 online science discussions. *Proc Natl Acad Sci* 2019, **116**:9785-9789 <https://doi.org/10.1073/pnas.1813486116>. Announcement of the rules governing online science discussions increases participation in the discussions and compliance with the rules among newcomers to the site. This experiment demonstrates a clever method for shaping norms to influence both behavior and participation in voluntary groups.
 17. Cialdini RB, Wosinska W, Barrett DW, Butner J, Gornik-Durose M: **Compliance with a request in two cultures: the differential influence of social proof and commitment/consistency on collectivists and individualists.** *Pers Soc Psychol Bull* 1999, **25**:1242-1253 <http://dx.doi.org/10.1177/0146167299258006>.
 18. Goldstein NJ, Cialdini RB, Griskevicius V: **A room with a viewpoint: using social norms to motivate environmental conservation in hotels.** *J Consum Res* 2008, **35**:472-482 <http://dx.doi.org/10.1086/586910>.
 19. Cialdini RB, Reno RR, Kallgren CA: **A focus theory of normative conduct: recycling the concept of norms to reduce littering in public places.** *J Pers Soc Psychol* 1990, **58**:1015-1026 <http://dx.doi.org/10.1037/0022-3514.58.6.1015>.
 20. van Kleef GA, Gelfand MJ, Jetten J: **The dynamic nature of social norms: New perspectives on norm development, impact, violation, and enforcement.** *J Exp Soc Psychol* 2019, **84**:103814 <http://dx.doi.org/10.1016/j.jesp.2019.05.002>.
 - 20] van Kleef GA, Gelfand MJ, Jetten J: The dynamic nature of social norms: New perspectives on norm development, impact, violation, and enforcement. *J Exp Soc Psychol* 2019, **84**: 103814 dx.doi.org/10.1016/j.jesp.2019.05.002. The authors provide an overview of research on social norms, with a focus on important recent developments and critical questions going forward. The review provides a treasure trove of insights about norms that could be used in behavioral interventions.
 21. Sunstein CR: *Conformity: the Power of Social Influences.* NYU Press; 2019 <http://dx.doi.org/10.1093/st/soaa013>.
 22. Cislighi B, Heise L: **Using social norms theory for health promotion in low-income countries.** *Health Promot Int* 2019, **34**:616-623 <http://dx.doi.org/10.1093/heapro/day065>.
 23. Gelfand MJ, Harrington JR, Jackson JC: **The strength of social norms across human groups.** *Perspect Psychol Sci* 2017, **12**:800-809 <http://dx.doi.org/10.1177/1745691617708631>.
 24. Schultz PW, Nolan JM, Cialdini RB, Goldstein NJ, Griskevicius V: **The constructive, destructive, and reconstructive power of social norms: reprise.** *Perspect Psychol Sci* 2018, **13**:249-254 <http://dx.doi.org/10.1177/1745691617693325>.
 25. Testa M, Livingston JA, Wang WJ, Lewis MA: **Preventing college sexual victimization by reducing hookups: a randomized controlled trial of a personalized normative feedback intervention.** *Prev Sci* 2020, **21**:388-397 <http://dx.doi.org/10.1007/s11121-020-01098-3>.
 26. Crosby S, Bell D, Savva G, Edlin B, Bewick BM: **The impact of a social norms approach on reducing levels of misperceptions around smokefree hospital entrances amongst patients, staff, and visitors of a NHS hospital: a repeated cross-sectional survey study.** *BMC Public Health* 2018, **18**:1365 <http://dx.doi.org/10.1186/s12889-018-6231-x>.
 27. Song K, Anderson K, Lee SH: **An energy-cyber-physical system for personalized normative messaging interventions: identification and classification of behavioral reference groups.** *Appl Energy* 2020, **260**:114237 <http://dx.doi.org/10.1016/j.apenergy.2019.114237>.

28. Mulla MM, Witte TH, Richardson K, Hart W, Kassing FL, Coffey CA, Hackman CL, Sherwood IM: **The causal influence of perceived social norms on intimate partner violence perpetration: converging cross-sectional, longitudinal, and experimental support for a social disinhibition model.** *Pers Soc Psychol Bull* 2019, **45**:652-668 <http://dx.doi.org/10.1177/0146167218794641>.
29. Asch SE: **Effects of group pressure upon the modification and distortion of judgments.** *Organ Influence Process* 1951:295-303.
30. Asch SE: **Opinions and social pressure.** *Sci Am* 1955, **193**:31-35 <http://dx.doi.org/10.1038/scientificamerican1155-31>.
31. Sherif M, Sherif CW: *Reference Groups; Exploration into Conformity and Deviation of Adolescents.* Harper and Row; 1964.
32. Hornsey MJ, Jetten J: **Stability and change within groups.** In *The Oxford Handbook of Social Influence.* Edited by Harkins SG, Williams KD, Burger J. Oxford University Press; 2017:299-315 <http://dx.doi.org/10.1093/oxfordhb/9780199859870.013.10>.
33. Nolan JM: **Social norms and their enforcement.** In *The Oxford Handbook of Social Influence.* Edited by Harkins SG, Williams KD, Burger J. Oxford University Press; 2017:147-164 <http://dx.doi.org/10.1093/oxfordhb/9780199859870.013.6>.
34. Paluck EL, Shepherd H, Aronow PM: **Changing climates of conflict: a social network experiment in 56 schools.** *Proc Natl Acad Sci U S A* 2016, **113**:566-571 <http://dx.doi.org/10.1073/pnas.1514483113>.
35. Lee JK, Kronrod A: **The strength of weak-tie consensus language.** *J Mark Res* 2020, **57**:353-374 <http://dx.doi.org/10.1177/0022243720904957>.
36. Dannals JE, Reit ES, Miller DT: **Looking up and down the hierarchy: target rank influences perceived descriptive norms.** *Organ Behav Hum Decis Process* 2020. [conditionally accepted, doi to come].
37. Prentice DA, Miller DT: **Pluralistic ignorance and the perpetuation of social norms by unwitting actors.** *Adv Exp Soc Psychol* 1996, **28**:161-209 [http://dx.doi.org/10.1016/s0065-2601\(08\)60238-5](http://dx.doi.org/10.1016/s0065-2601(08)60238-5).
38. Schroeder CM, Prentice DA: **Exposing pluralistic ignorance to reduce alcohol use among college students.** *J Appl Soc Psychol* 1998, **28**:2150-2180 <http://dx.doi.org/10.1111/j.1559-1816.1998.tb01365.x>.
39. Amialchuk A, Ajilore O, Egan K: **The influence of misperceptions about social norms on substance use among school-aged adolescents.** *J Health Econ* 2019, **28**:736-747 <http://dx.doi.org/10.1002/hec.3878>.
40. Kroshus E: **College athletes, pluralistic ignorance and bystander behaviors to prevent sexual assault.** *J Clin Sport Psychol* 2019, **13**:330-344 <http://dx.doi.org/10.1123/jcsp.2018-0039>.
41. Mildenberger M, Tingley D: **Beliefs about climate beliefs: the importance of second-order opinions for climate politics.** *Br J Polit Sci* 2019, **49**:1279-1307 <http://dx.doi.org/10.1017/S0007123417000321>.
42. Van Boven L, Ehret PJ, Sherman DK: **Psychological barriers to bipartisan public support for climate policy.** *Perspect Psychol Sci* 2018, **13**:492-507 <http://dx.doi.org/10.1177/1745691617748966>.
43. Miyajima T, Yamaguchi H: **I want to but I won't: pluralistic ignorance inhibits intentions to take paternity leave in Japan.** *Front Psychol* 2017, **8**:1508 <http://dx.doi.org/10.3389/fpsyg.2017.01508>.
44. Munsch CL, Weaver JR, Bosson JK, O'Connor LT: **Everybody but me: pluralistic ignorance and the masculinity contest.** *J Soc Issues* 2018, **74**:551-578 <http://dx.doi.org/10.1111/josi.12282>.
45. Allcott H, Rogers T: **The short-run and long-run effects of behavioral interventions: experimental evidence from energy conservation.** *Am Econ Rev* 2014, **104**:3003-3037 <http://dx.doi.org/10.1257/aer.104.10.3003>.
46. Jachimowicz JM, Hauser OP, O'Brien JD, Sherman E, Galinsky AD: **The critical role of second-order normative beliefs in predicting energy conservation.** *Nat Hum Behav* 2018, **2**:757-764 <http://dx.doi.org/10.1038/s41562-018-0434-0>.
- 46] Jachimowicz JM, Hauser OP, O'Brien JD, Sherman E, Galinsky AD: The critical role of second-order normative beliefs in predicting energy conservation. *Nat Hum Behav* 2018, **2**:757-764 dx.doi.org/10.1038/s41562-018-0434-0. Results from a secondary analysis of 211 randomized controlled trials and a follow-up experiment show that perceived social norms supporting energy conservation are better predictors of conserving behavior than are personal beliefs. The research is very strong empirically and highlights the importance of intervening to promote energy conservation at the community level.
47. Henry ML, Ferraro PJ, Kontoleon A: **The behavioural effect of electronic home energy reports: evidence from a randomized field trial in the United States.** *Energy Policy* 2019, **132**:1256-1261 <http://dx.doi.org/10.1016/j.enpol.2019.06.039>.
48. Wolske KS, Gillingham KT, Schultz PW: **Peer influence on household energy behaviours.** *Nat Energy* 2020, **5**:202-212 <http://dx.doi.org/10.1038/s41560-019-0541-9>.
49. Drury J: **Recent developments in the psychology of crowds and collective behaviour.** *Curr Opin Psychol* 2020, **35**:12-16 <http://dx.doi.org/10.1016/j.copsyc.2020.02.005>.
50. Hopkins N, Reicher S, Stevenson C, Pendey K, Shankar S, Tewari S: **ecognition, validation and solidarity.** *Eur J Soc Psychol* 2019, **49**:1283-1297 <http://dx.doi.org/10.1002/ejsp.2586>.
- 50] Hopkins N, Reicher S, Stevenson C, Pendey K, Shankar S, Tewari S: Social relations in crowds: Recognition, validation and solidarity. *Eur J Soc Psychol* 2019, **49**:1283-1297 dx.doi.org/10.1002/ejsp.2586. Through analyses of interviews with participants in a month-long gathering in India, the authors demonstrate the ways in which recognition, validation, and solidarity work to create identity and collective meaning within a spontaneous group. This research is an example of the type of research needed to link work on spontaneous and engineered social change.