Linking Individual Behavior and Systems Change: A Review of the Social Science Literature

This document highlights some of the most interesting social science involved in exploring the link between individual behavior and systems change. To develop a stronger understanding of the social science research, we looked at the following themes: (1) how does individual action influence other individual actions within the same person (spillover, consistency), (2) how do individuals influence others (social norms, second-order beliefs, credibility), (3) what is the connection between individual actions and policy actions, and (4) what is the connection between policy decisions and public engagement. This is an annotated bibliography-style review of some of the most interesting resources we were able to find in our search. Please note: this is not an exhaustive list, nor is it in publishable format. Instead, it provides some insight into the types of theories and research that can help the reader discuss the links between individual and political or systems change. It also provides the basis for further exploration into the social science research. This format was selected because it allows the reader to understand both the basic theory behind each paper and the possible relevance to one's own work.

Attari, S. Z., Krantz, D. H., & Weber, E. U. (2016). Statements about climate researchers' carbon footprints affect their credibility and the impact of their advice. Climatic Change, 138(1), 325–338. https://doi.org/10.1007/s10584-016-1713-2

In this paper, researchers conducted two online studies to measure whether a climate researcher's perceived energy use (in the areas of flying, public transportation, and home energy use) affected their credibility and influence. The results showed that when researchers were perceived to have a large carbon footprint, their credibility was greatly reduced. Additionally, when scientists had lower credibility participants reduced their own stated willingness to reduce their own energy use. This paper was written by established behavioral scientists and published in a peer-reviewed journal. This research shows that participants are affected by the perceived behaviors of climate experts and underscores the need for experts and communicators to align their communications with their behaviors.

Bicchieri, C., & Mercier, H. (2014). Norms and Beliefs: How Change Occurs. In M. Xenitidou & B. Edmonds (Eds.), The Complexity of Social Norms (pp. 37–54). https://doi.org/10.1007/978-3-319-05308-0_3

Using examples outside of the sustainability area, this chapter looks at the role of social norms and suggests the conditions under which social norms can change. The authors posit that it is possible to introduce new norms through explicit or implicit discussions in order to create new expectations for behavior. By changing the empirical norm (what people are doing) and the normative expectations (what people expect that I should do), the norms can be changed. The authors state that these

discussions must be based on a system of shared beliefs and values. The lead author of this chapter is Cristina Bicchieri, a leading academic in the field of behavioral ethics and an expert on social norm theory. For change makers and policymakers, this resource is useful for outlining the conditions under which norms exist and can be changed. Additionally, this chapter talks specifically about the importance of groups in creating and spreading new norms, which is especially relevant for organizations that have strong, community engagement models.

Centola, D., Becker, J., Brackbill, D., & Baronchelli, A. (2018). Experimental evidence for tipping points in social convention. Science, 360(6393), 1116–1119. https://doi.org/10.1126/science.aas8827

This paper takes an experimental approach to critical mass theory, which looks at the level of participation needed to overturn a conventional view. Previously, qualitative studies and theoretical models placed the tipping point between 10 and 40% participation. Through a series of experiments, Centola et al. were able to demonstrate that when a committed minority of people reached 25%-27% of the population, a tipping point was triggered. For populations over 1000 this tipping point was found to be 24.3%. This paper was published in Science, one of the world's leading peer-reviewed journals from the American Association for the Advancement of Science. This research demonstrates the power of strong minority views to overturn conventional thinking and can be used to inform sustainable behavior strategy within groups, organizations, communities, and ultimately within mainstream culture. For the purposes of this project, it is also important to note that in one case the addition of one committed person to the minority view triggered the tipping point for the whole group.

Doherty, K. L., & Webler, T. N. (2016). Social norms and efficacy beliefs drive the Alarmed segment's public-sphere climate actions. Nature Climate Change, 6, 879–884. https://doi.org/10.1038/nclimate3025

While there has been some research to understand individual private-sphere actions, there has been little research to understand what leads people to take political action on climate. This study examines the 'Alarmed' segment of Global Warming's Six Americas by considering the role of social norms as well as four different types of efficacy, including self-efficacy (the belief that I can achieve my task), personal response efficacy (the belief that my task will be effective in leading to the desired outcome), collective efficacy (the belief that the group can perform its task) and collective response efficacy (the belief that the group will be effective in leading to the desired outcome). Researchers found people in the more active half of the 'Alarmed' category- those with higher levels of voting, donating, volunteering, contacting representatives, and protesting reported higher levels of descriptive social norms, self-efficacy, personal response efficacy, and collective response efficacy. They found that high levels of

descriptive social norms – the number of people similar to the respondent who engaged in climate action – was the greatest predictor of political action. Finally, researchers found that people who felt a high level of responsibility on the issue had increased levels of self-efficacy, personal response efficacy, and collective response efficacy. This report was published in a peer-reviewed climate change journal. This report connects people's willingness to engage in public-level climate action with their perception of how effective they will be. It also shows how their willingness to participate in climate action is affected by the actions of others in their peer group. This underscores the importance of communicating individual political actions to one's peers.

Gächter, S., & Renner, E. (2018). Leaders as role models and 'belief managers' in social dilemmas. Journal of Economic Behavior & Organization, 154, 321–334. https://doi.org/10.1016/j.jebo.2018.08.001

This paper looks at the role of leaders in shifting the pro-social beliefs of followers. Through an experiment involving a 'leader treatment' and a 'no leader treatment', researchers tested the influence of leaders on followers' beliefs and contributions. The researchers find strong path dependency as well as a strong correlation between pro-social beliefs and actions. The researchers find that leaders initially shape the followers' beliefs and contributions and that over time this influence declines as followers begin to follow the behaviors of past followers. Finally, researchers found evidence of a "leader's curse" where followers may not contribute as strongly as the leader and thus the leader may decide to reduce their contributions over time. This article was recently published in an academic journal by researchers from the University of Nottingham, UK. For the practitioner community, this article highlights the role that leaders can have in shaping beliefs and actions. It also serves as a reminder to leaders to continue their sustainable behaviors over time, even if they observe that their community of followers is not engaging at the same level.

Kraft-Todd, G. T., Bollinger, B., Gillingham, K., Lamp, S., & Rand, D. G. (2018). Credibility-enhancing displays promote the provision of non-normative public goods. Nature, 563(7730), 245. https://doi.org/10.1038/s41586-018-0647-4

In this study, researchers explore the role of credibility-enhancing displays and second-order beliefs in promoting goods that are not widely adopted. Credibility-enhancing displays is a concept used in the study of religious communities which posits that beliefs are spread through actions because these actions reveal the true nature of the actor's real beliefs (also known as second-order beliefs). Through a large field study of solar panel installation in Connecticut, researchers found that 62.8 percent more residents installed solar panels when a community organizer had also installed panels through the same

program. These findings were replicated through three online studies on solar panels (experiments 1-2) as well as other non-normative goods (experiment 3). This was published by the journal Nature. This paper is important for the sustainable behavior community because it demonstrates the importance of personal actions in building credibility when advocating for sustainable goods and practices.

Mullen, E., & Monin, B. (2016). Consistency Versus Licensing Effects of Past Moral Behavior. Annual Review of Psychology, 67, 363–385. https://doi.org/10.1146/annurev-psych-010213-115120

This review paper looks at the question of why initial behaviors sometimes lead to more behaviors (consistency) while other times they lead to fewer behaviors (licensing). Through a review of 25 studies, the authors are able to draw some general but not universal conclusions about when initial behaviors lead to consistency versus licensing. They generalize that consistent behaviors are more likely to occur when the behaviors are considered abstractly, described as progress towards a goal, and are connected to underlying values. Licensing is more likely to occur when the behaviors are thought about in a concrete manner, people think more about the commitment, and when they don't identify with the goal. Moreover, it was concluded that underlying values were important for consistency. This Annual Review paper provides a good overview of the main issues of consistency and licensing in the field of psychology. In order to make sustainable behaviors relevant for reducing emissions, to influence others behaviors, and to influence social norms, researchers and practitioners must understand how sustainable behaviors can be more consistent practices. Thus, understanding what is likely to create the conditions for consistent behavior is important for designing interventions and promoting sustainable behaviors.

Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. Personality & Social Psychology Bulletin, 34(7), 913–923. https://doi.org/10.1177/0146167208316691

This research investigates the power of normative influence on behavior in the context of energy conservation. Researchers compared four different reasons for energy conservation: environmental protection, benefit to society, saving money, and neighbor behavior influence. The first study focused strictly on the strengths of relationships between self-reported reasons for conservation and social influence. Results showed that despite intrinsic reasons rating as the highest for conservation, the strongest predictor was actually the belief other people are doing it; indicating the unknown power of normative social influence. The second study was an experiment to determine the causal relationships of the first. The results confirmed that normative messages have the biggest effect on behavior change.

Participants who were assigned to see that their neighbors conserved energy used significantly less energy than all combined conditions. The research was published by a peer-reviewed psychology journal. This research is vital for sustainable behavior practitioners because it demonstrates empirically the power normative social influence has on behavior, and how underrated people believe it is.

Ockwell, D., Whitmarsh, L., & O'Neill, S. (2009). Reorienting Climate Change Communication for Effective Mitigation: Forcing People to be Green or Fostering Grass-Roots Engagement? Science Communication, 30(3), 305–327. https://doi.org/10.1177/1075547008328969

This article argues that while top-down approaches such as regulation might be effective for reducing emissions, governments are unlikely to establish them without strong public support. Similarly, advocating for voluntary-only action has limited effectiveness as it ignores the structural and social norm barriers for change. The authors argue that climate communications can link the bottom-up and top-down approaches by increasing public acceptance of regulation while also activating the grassroots to create public policy demand. This paper was published in 2009 in a peer-reviewed journal in the area of science communication. While some of the political examples in the paper are outdated, the article's overall argument is relevant for understanding how public engagement can help create the conditions for policy and structural change.

Roser-Renouf, C., Maibach, E., Leiserowitz, A., Zhao, X. (2014). The genesis of climate change activism: from key beliefs to political action. Climatic Change. 125: 163-178.

The authors propose a two-stage theoretical model where individuals first develop beliefs about climate change risks and causes along with beliefs about our collective ability and willingness to solve climate change and then consider the effectiveness of climate activism, barriers, and opinion leadership to determine their actual engagement in climate related political action. It is important to note that as a cross-sectional survey limited by a low response rate, this study is limited in its explanatory power and ability to derive causal pathways between key beliefs and participation in climate change activism. These limitations and the relative paucity of other similar studies in the climate change space point to a serious need for additional work in this area.

Only 16.9% of the study sample had engaged in at least one of three climate activism behaviors. In basic measurement models, key beliefs about climate change (climate change is happening, is posing a risk to humans, is human-caused, and is solvable) predicted 21% of the variation in activism, with additional demographic variables, values (egalitarianism vs. individualism), and collective efficacy adding little

additional explanatory power. Using a full structural model, six measured and latent variables explained 52% of the variation in climate activism: climate opinion leadership, civic engagement, activism response efficacy, injunctive beliefs, perceived barriers, and gender. The primary takeaways include: 1) There is a need to continue to communicate the risks of climate change impacts while also emphasizing the efficacy of steps to combat the problem. 2) Seventy-four percent of respondents did not believe that climate activism is effective. Communicating the effectiveness of climate action should be a major focus of climate mobilization efforts. 3) Encouraging people to talk to their friends and family about climate change can help build opinion leadership on climate change and build a bridge to further climate activism. The authors note that encouraging this kind of opinion leadership may be the most effective method to build public engagement and activism.

Sparkman, G., & Walton, G. M. (2017). Dynamic Norms Promote Sustainable Behavior, Even if It Is Counternormative. Psychological Science, 28(11), 1663–1674. https://doi.org/10.1177/0956797617719950

This research explores the question of whether highlighting a dynamic norm (a norm that is changing over time) can influence people's decision making. This paper reviews 5 experiments related to meat consumption (experiments 1-4) and water conservation (experiment 5) to show that communicating the changing norm increased motivation and behavior change. The experiments showed that highlighting these shifting norms resulted in increased interest in eating less meat, doubling meatless orders at a café, and reduced water consumption. This research was published in the peer-reviewed journal Psychological Science. This research is extremely relevant for sustainable behavior practitioners because it demonstrates how non-normative sustainable behaviors (flying less, eating a plant-based diet, not having a car) could become more prevalent through individuals and groups communicating these changing norms.

Sunstein, C. (2019). How Change Happens. Cambridge, MA: MIT Press, p. 6-12

In his new book How Change Happens, Cass Sunstein explores how norms change and how 'norm entrepreneurs' can help create this change. He describes two scenarios under which social norms can shift. The first occurs when there is a hidden belief in a community that goes against a prevailing social norm. If a person decides to make this belief visible by challenging the norm, then others will follow. This kind of change can happen rapidly if a large number of people were acting in a way that was normative but was not consistent with their underlying beliefs. In the second type, there is no hidden belief, and so beliefs begin to shift and evolve as when people change the norms. This is often not as

rapid of a transformation, but it can be important for furthering new ideas. Drawing from previous work, Sunstein defines a 'norm entrepreneur' as someone who wants to create social change--and in turn, change what is regarded as normal--through their actions. Importantly, when a norm starts to change, it can also change how people are viewed. A 'norm entrepreneur' can sometimes be seen as "courageous, authentic, and tough." Sunstein also describes cascade effects where people begin to believe something because they begin to see others also care. This quick read is highly recommended for people who are interested in understanding the possibility of engaging with their members or participants in efforts to create new norms.

Truelove, Heather Barnes, Amanda R. Carrico, Elke U. Weber, Kaitlin Toner Raimi, and Michael P. Vendenbergh. (2014). Positive and negative spillover of pro-environmental behavior: An integrative review and theoretical framework. Global Environmental Change, 29: 127-138.

The literature on behavior spillovers provides a variety of answers to the critical question: When a person performs a positive environmental behavior (PEB), do they become more or less likely to perform additional PEBs as a result of the first PEB? Negative spillovers may be driven by rebound effects, single action bias, and moral licensing effects. Positive spillovers may be driven by consistency effects and identity effects. The authors attempt to bring together the different strands of literature into an organizing theoretical framework. They categorize spillover-driving behaviors based on three elements: 1) decision mode, 2) motivational attribution, and 3) characteristics of the behavior. PEBs that take place in a calculation-based decision mode (e.g., energy efficiency rebound effects) are more likely to lead to negative spillovers. PEBs that take place in negative affect-based decision mode (e.g., recycling to relieve guilt) are more likely to lead to negative spillovers. PEBs that take place in a role-based decision mode (e.g., choosing to buy a Hybrid due to the salience of an environmentalist identity) are more likely to lead to positive spillovers. In the role-based decision mode, internal or intrinsic motivations are likely to amplify the positive spillover effect. Positive spillovers to subsequent PEBs reinforce the role-based identity, leading to a positive feedback loop. The perceived similarity of PEBs (e.g., fuel efficiency and driving less) also amplifies the spillover effect. The findings in this review paper suggest that policymakers should seek policies that leverage role-based decision modes (e.g., identity as an environmentalist or a parent) rather than affect-based decision modes (e.g., fear/guilt).

van Der Linden, S. (2015). Intrinsic motivation and pro-environmental behaviour. Nature Climate Change, 5(7), 612.

This article was featured in Nature Climate Change in 2015 as an opinion piece. The author examined two studies and their relation to prolonged pro-environmental behavior. The first study empirically explored the helpers high (termed warm glow) -- a physical increase in the thermal state from acting in environmentally friendly ways. The author compares this to a study that explored extrinsic motivation for pro-environmental behavior and argued the untapped importance of intrinsic motivation. The second study empirically showed that external rewards (in the form of prizes from a competition) for campus-wide energy conservation significantly improved pro-environmental behavior. However, once the competition ended the behavior reversed and went back to pre-competition baseline. This article provides crucial commentary about the power of intrinsic motivation and how underutilized it is. As such a robust and researched construct in social psychology, it should be at the forefront of environmental action and behavior change.

van der Linden, S., Maibach, E., & Leiserowitz, A. (2015). Improving Public Engagement With Climate Change: Five "Best Practice" Insights From Psychological Science. Perspectives on Psychological Science: A Journal of the Association for Psychological Science, 10(6), 758–763. https://doi.org/10.1177/1745691615598516

This paper provides a brief overview of major insights from psychology for engaging the public on climate change and makes five best practice recommendations: (1) make it personal by emphasizing narratives and experience, (2) leverage the power of social norms, (3) highlight local examples and risks, (4) talk about the gains from taking action, and (5) intrinsically motivate people by connecting to long term environmental values. This is a peer-reviewed paper. Due to the complexity of much of the academic research written on decision-making, consistency, social norms, efficacy, prospect theory, and internal/external motivation, this is a recommended resource for all practitioners who want to gain a basic understanding of how the lessons learned in the field could be applied to engagement, communications, and policy strategies.

Willis, R. (2018a). Constructing a 'Representative Claim' for Action on Climate Change: Evidence from Interviews with Politicians. Political Studies, 66(4), 940–958. https://doi.org/10.1177/0032321717753723

Through interviews with 14 members of the UK parliament, this paper works to reconcile representatives' responsibilities to their local constituency with the recognized need to enact climate

policy. Using Michael Saward's concept of 'representative claim', the idea that there is a dynamic exchange between an elected politician and their represented community, Willis outlines four major claims used by politicians to promote climate policy: cosmopolitan claim (global problem, everyone is impacted), local prevention claim (impacting our community), co-benefits claim (local benefits through employment, infrastructure) and a surrogate claim (promote other related policy without mentioning climate e.g. public transit). Willis found that politicians feel 'little or no pressure' from their constituents on climate policy when compared to more local and immediate issues and concludes that individuals and groups need to work with politicians to create, develop, and shape representative claims. Due to the quickly changing nature of the climate change debate, some of the attitudes from these interviews, which were conducted in 2016 and published in this peer-reviewed publication in 2018, are likely to be outdated. Despite this, the four frames captured in the interviews and the dynamic relationship between elected officials and constituents are highly relevant. This article is important for understanding the need for public engagement and for outlining the role that individuals and groups can play in helping to shape and support climate policy.

Forthcoming publication:

Attari, S. Z., Krantz, D. H., and Weber, E. U. Climate change communicators' carbon footprints affect their audience's policy support (under review)