

Climate Psychology: What is preventing the uptake in lifestyle changes that would significantly reduce one's environmental impact?

Chris Macdonald^{1*}

¹Skylab, United Kingdom

*Corresponding author: Chris Macdonald: chrismacdonald@dr.com



Citation: Macdonald C. (2020) Climate Psychology: What is preventing the uptake in lifestyle changes that would significantly reduce one's environmental impact? Open Science Journal 5(3)

Received: 2nd May 2020

Accepted: 28th July 2020

Published: 8th September 2020

Copyright: © 2020 This is an open access article under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Funding: The author received no specific funding for this work

Competing Interests: The author has declared that no competing interests exist.

Abstract:

Human consumption and human emissions are rapidly destroying our home planet and the vital ingredients of life—the science is clear and abundant. And so, we need to make extreme changes in many aspects of life as quickly as possible—as a matter of survival. This paper explores the underlying mechanisms that prevent the uptake in lifestyle changes that would significantly reduce one's environmental impact. The hope being that this information will help to inform future campaigns that seek to increase sustainable behaviour. As part of the project, students were asked to complete an anonymous survey about lifestyle changes and environmental impact. Before starting they were reminded that there is no right or wrong answer and that they should give their honest opinion. Perhaps the most reassuring of the findings was that over 90% of both UK and U.S. participants stated that they were concerned about the climate crisis and that they felt that it is important to make lifestyle changes to reduce harmful emissions, thus indicating a general awareness and motivation to take personal action. The most common reasons cited for not wanting to make a suggested lifestyle change were that the participant felt as though it is difficult to make the suggested change, and that the suggested change would not make a significant difference. Accordingly, the opposite statements were the most common reasons given for why the participants would consider making a suggested lifestyle change (it is easy to make the suggested change, and the participant felt that the suggested change would make a significant positive impact). The paper concludes by exploring ways to facilitate the uptake in sustainable lifestyle choices based on the survey responses.

Keywords: Psychology, Behavioural Economics, Sociology, Sustainability, Climate Change, Climate Communication, Environment, Environmental Footprint, Lifestyle, Ethics

Introduction

Human consumption and human emissions are rapidly destroying our home planet and the vital ingredients of life—the science is clear and abundant (Hansen et al, 2010; Braje et al, 2013; Cook et al, 2013; Cook et al, 2016; Powell, 2016; Powell, 2017; Turner et al, 2017; Burrell et al, 2020; Clem et al, 2020). And so, we need to make extreme changes in many aspects of life as quickly as possible—as a matter of survival.

When the nations of the world came together to sign the Paris Agreement in 2015 (UN, 2015), there was a sigh of relief from many in the scientific community. While some criticized that it wasn't strict enough (Le Page, 2015), it at least showed political acknowledgement of the climate and ecological crisis. It showed some level of acceptance from the world's leaders that they can and must take action (Singer et al, 2018).

While it is important that corporations and politicians make swift and meaningful changes, we too can play our part; the Paris Agreement itself highlights that personal behaviour must also change if we are to become a sustainable species (UN, 2015).

However, when looking around in day-to-day life, it appears that many of us are continuing with business as usual. Therefore, I feel that it would be wise to investigate if there is something preventing the uptake in lifestyle changes that would significantly reduce one's environmental impact.

As is stands, there is the potential for a mass bystander-esque effect, where most are aware of the climate and ecological crisis (Pandve et al, 2011; Capstick et al, 2015; Lee et al, 2015; Leiserowitz et al, 2018), but as most are carrying on with their existing behaviour, many may be less inspired to act or to take it seriously (Latané et al, 1969; Christakis et al, 2013). However, if more people were to act as though we are in an emergency, this may cause a ripple effect where they evoke urgency from those around them (Christakis et al, 2008; House, 2011; Sprague et al, 2017; Burgess et al, 2018).

While it is often easy to narrativize the inaction of others as apathetic or mean-spirited, there is often something more complicated going on. People, in general, do want to help and do want to support helpful others (Warneken et al, 2006; Hamlin et al, 2007; Hamlin et al, 2011; Barragan et al, 2014), but there are certain factors that have been shown to limit helpful action. And unfortunately, the climate and ecological crisis can include many of these factors; for example, individuals are far more likely to help when there are fewer people involved in the situation (Latané et al, 1969; Brody et al, 2016), when others are incapable of helping (Plötner et al, 2015), when we have direct eye-contact with the victims (Valentine, 1980), when the issue feels closer (Spence et al, 2012), when there is a sense of equal effort (Gifford, 2011), and when the scenario requires well-rehearsed and clear action (Latané et al, 1969). Thus, the climate crisis may inherently incorporate many underlying mechanisms that can facilitate complicit behavior.

What's more, the inaction itself can further perpetuate inaction. As a communicative, social species, we automatically scan for cues from others (Visser et al, 2018), and when those around us are not taking action, this can result in,

what Latané and Darley call, pluralistic ignorance (Latané et al, 1969). This is where the participant is influenced by, what could be misinterpreted as, a lack of concern from those around them (Latané et al, 1969).

In short, what may be the defining crisis of our era involves many compounding and complicated factors that make it a difficult one to tackle. And given that time is against us (UN, 2015; Burrell et al, 2020; Forster et al, 2020; Vargo et al, 2020), I see it as highly worthwhile to try to decipher the main components that are hindering positive action at an individual level. As noted in prior climate research, attention has largely focused on factors that influence institutional actors (governments, industries, etc) while factors that influence personal choices have received significantly less attention (NRC, 2011; Clayton et al, 2015).

Experiment

The experiment explores what is preventing the uptake in lifestyle changes that would significantly reduce one's environmental impact (in particular, in the areas that account for the vast majority of emissions such as food and transport). The hypothesis is that psychological factors may be significantly hindering action, in addition to more material and physical reasons (i.e a lack of sustainable alternatives). As a secondary component, the investigation will include participants of different nationalities: the U.S. and the UK. Given that one government became the first to withdraw from the Paris Agreement (U.S.), and the other became the first to declare a climate emergency (UK), it will be interesting to see if there is a notable difference in responses from the citizens of each group.

Participants

100 randomly selected students took part in the experiment (50 UK students and 50 U.S. students). In an attempt to reduce variables, all participants also had the following in common: aged 18-25, Caucasian ethnicity, and English-only spoken at home.

Procedure

Each participant was asked to complete the same anonymous survey via a private online portal. Before starting they were reminded that there is no right or wrong answer and that they should give their honest opinion. The survey explored the participants' thoughts on the subject of behavioral changes that help to mitigate human-caused climate change.

*All of the students were paid to take part.

Results

General section, part 1

Question 1: Are you concerned about climate change and pollution?

UK Participants: 98% Yes

US Participants: 96% Yes

Question 2: Do you feel that it is important to make personal lifestyle and consumption changes if it significantly reduces harmful emissions?

UK Participants: 94% Yes

US Participants: 92% Yes

Diet section

Question 3: Do you currently follow a plant-based diet?

UK Participants: 14% Yes

US Participants: 6% Yes

Question 4: If you answered no to the previous question, please answer this question: If you were provided with reputable, scientifically-backed information showing that switching to a plant-based diet significantly reduces harmful emissions, would you make the change?

UK Participants: 42% Yes

US Participants: 28% Yes

Question 5: If you have already switched or would switch to a plant-based diet please indicate why (if not leave blank)

UK Participants:

Most common reason provided was to reduce negative environmental impact

Second most common answer was for ethical reasons

And the third most common response was for health reasons

US Participants:

Most common reason was to reduce negative environmental impact

Second most common answer was for ethical reasons

And the third most common response was for health reasons

Question 6: If you would not switch to a plant-based diet please indicate why (if not leave blank)

UK Participants:

Most common reason was that the participant likes the taste of meat

Second most common response was that the participant doesn't feel the need to switch as they feel that it doesn't make a big difference

And the third most common response was that the participant doesn't like the plant-based diet/ dietary restrictions

US Participants:

Most common reason was that the participant likes the taste of meat

Second most common response was that the participant doesn't feel the need to switch as they feel that it doesn't make a big difference

And the third most common response was that the participant would be concerned about a lack of protein

Aviation section

Question 7: Do you currently travel by plane?

UK Participants: 76% Yes

US Participants: 54% Yes

Question 8: If you answered yes to the previous question, please answer this question: If you were provided with reputable, scientifically-backed information showing that stopping flying significantly reduces harmful emissions, would you stop flying?

UK Participants: 11% Yes

US Participants: 4% Yes

Question 9: If you would stop flying or have already stopped flying please indicate why (if not leave blank)

UK Participants:

The three most common responses (with equal usage) were environmental reasons, a dislike of flying, and that there is no need to travel outside of the UK.

US Participants:

The most common reason given was if they don't need to

The second most common reason given was environmental reasons

The third most common reason given was to save money

Question 10: If you would not stop flying please indicate why (if not leave blank)

UK Participants:

Because participant likes to travel

Because planes are quicker and more convenient

Because participant feels that not flying wouldn't make much of a difference

US Participants:

Because there is no convenient alternative

Because it is the fastest and cheapest option

Because participant likes to travel

Car section

Question 11: Do you currently drive a car?

UK Participants: 40% Yes

US Participants: 72% Yes

Question 12: If you answered yes to the previous question, please answer this question: If you were provided with reputable, scientifically-backed information

showing that stopping driving significantly reduces harmful emissions, would you make the change to an alternative (i.e walking, cycling, public transport, etc)?

UK Participants: 25% Yes

US Participants: 11% Yes

Question 13: If you have already stopped or would stop driving please indicate why (if not leave blank)

UK Participants:

Because they can use public transport instead

Because it is cheaper to not drive

Because it is better for personal and environmental health

US Participants:

Because they can use public transport instead

Because it is better for personal and environmental health

Because it is cheaper to not drive

Question 14: If you not would stop driving please indicate why (if not leave blank)

UK Participants:

Lack of convenient public transport

Driving is the best option (faster/ easier)

They feel they need to drive

US Participants:

They feel they need to drive

Lack of convenient public transport

Driving is the best option (faster/ easier)

Consumption section

Question 15: If you were provided with reputable, scientifically-backed information showing that reducing consumption significantly reduces harmful emissions, would you reduce your consumption?

UK Participants: 76% Yes

US Participants: 72% Yes

Question 16: If you have already reduced or would reduce your consumption please indicate why (if not leave blank)

UK Participants:

To reduce their negative impact on the environment

Because it is an easy change to make

Because it is good for their mental and physical health

US Participants:

Because it is an easy change to make

To reduce their negative impact on the environment

Because it is good for their mental and physical health

Question 17: If you would not reduce your consumption please indicate why (if not leave blank)

UK Participants:

Felt that it wouldn't make a significant impact

US Participants:

Don't want to/ enjoy consuming

Felt that it wouldn't make a significant impact

General section, part 2

Question 18: What do you think are the key reasons that prevent yourself or others from making lifestyle changes that would help reduce air pollution, protect the environment, and combat climate change?

UK Participants:

Because it is challenging

Because there is a lack of knowledge

Because they feel as though they don't make a difference

US Participants:

Because it is challenging

Because they feel as though they don't make a difference

Because there is a lack of knowledge

Key findings

Perhaps most reassuring of the results is that over 90% of both UK and U.S. participants stated that they were concerned about climate change and that they feel that it is important to make lifestyle changes to reduce harmful emissions—thus indicating a general awareness and motivation to take personal action.

One of the biggest differences between the two groups was the willingness to make lifestyle changes. In some sections of the survey, UK participants were twice as likely to say that they would make a change to reduce harmful emissions if they were provided with reputable, scientifically-backed information. The UK participants were also more likely to have already implemented the suggested change. For example, when asking participants if they currently follow a plant-based diet there was a significant difference between both groups with participants from the UK being more than twice as likely to say yes, suggesting the potential of a strong cultural influence. Accordingly, prior research suggesting the potential of has shown that opinions on climate science can be strongly associated with political ideology and worldview (Kahan et al, 2010; McCright et al, 2013; Clayton et al, 2015).

One of the biggest similarities between both groups were the reasons they gave for whether or not to make a given lifestyle change. The most common reasons for not wanting to make lifestyle changes could be summarized by two factors: 1, it is difficult to make the suggested change, and 2, the participant feels that the suggested change would not make a significant difference. Accordingly, the opposite statements were the most common reasons given for why the

participants would consider making a lifestyle change (it is easy to make the suggested change, and the participant feels that the suggested change would make a significant difference).

The experiment explored what is preventing the uptake lifestyle changes that would significantly reduce one's environmental impact, and the results suggest that, in addition to material reasons (i.e. inconvenient or inaccessible alternatives), psychological factors may also play a significant role in hindering action. In particular, the feeling that the suggested change wouldn't make a significant difference appears to be a common barrier to sustainable lifestyle changes. Thus, in addition to making sustainable choices more accessible, it may also be beneficial to tackle the potential psychological barrier: the thought that what one does at an individual level doesn't make a significant impact.

Further research

While it is important to note that 100 people is still a relatively small sample size, the significant trends in the responses suggest a broader opinion of the student population, however, further research is needed to confirm this. Further research is also required to see if the trends from our sample group are shared by other demographics. Comparisons with non-student groups would be interesting grounds for further research.

The field of climate communication is a relatively new one, and the research tends to focus on climate awareness (Nisbet et al, 2007; Feldman et al, 2010; Leiserowitz et al, 2010; Wachholz et al, 2014; Capstick et al, 2015; Leiserowitz et al, 2016; Chadwick, 2017; Taddicken et al, 2019; Van Swol et al, 2019). While the field is continuing to grow, a subcategory that is falling behind is public engagement with climate solutions (Chadwick, 2017). Therefore, I also encourage a diverse range of experiments exploring practical methods to increase the uptake in sustainable behaviour. Below are a few ideas, based upon the findings from the survey.

Personalized facts

A potential solution for the feeling that personal change doesn't make a significant impact could be how certain facts are conveyed. For example, switching to a plant-based diet is widely regarded as one of the most impactful personal changes that one can make with regards to combating the climate and ecological crisis (Koneswaran et al, 2008; Machovina B, et al. 2015; UN, 2018; Poore J, et al. 2019; Ritchie, 2020). However, the facts are often displayed generally and somewhat impersonally and detached, such as:

“Farm animals and animal production facilities cover one-third of the planet’s land surface ... Deforestation, land degradation, soil cultivation, and desertification are responsible for CO2 emissions from the livestock sector’s use of land” (Koneswaran et al, 2008)

Given the participants' responses in the survey, perhaps a more personalized approach would be more effective. Below is an example of a personalized style of conveying the harmful environmental impact of animal agriculture:

If you were to switch to a plant-based diet, there would be measurable, highly significant results. In a single month, you personally would have saved 600lbs of CO₂, 900sq ft of forest, 1,200lbs of grain, and 33,000 gallons of water (TVC, 2019). Just by modifying your diet, you can stop funding the leading cause of deforestation (WAF, 2019), ocean dead-zones (SA, 2019), habitat destruction (UN, 2006), species extinction (WAF, 2019), water pollution (USGS, 2006), methane pollution (Koneswaran et al, 2008), and nitrous oxide pollution (UN, 2006; Koneswaran et al, 2008).

One might assume that if the data were conveyed in this manner then the participants would be less likely to feel as though they are not personally making a significant difference. When looking at the impacts of climate change, prior research has shown that direct experiences of climate events are more powerful at influencing behaviour when compared to disconnected experiences (Whitmarsh, 2009; Spence et al, 2011; Rudman et al, 2013; Clayton et al, 2015). Therefore, more direct links to the impacts of lifestyle changes via optimized communication strategies could have a similar effect. Personalized facts may provide fertile ground for future research. Those pursuing this line of inquiry may want to explore the latest research on climate communication and framing (Amelung et al, 2016; Baumer et al, 2017; Schneider et al, 2017; Chryst et al, 2018; Romsdahl et al, 2019; Goldberg et al, 2019a; Goldberg et al, 2019b; Buttlar et al, 2020; Jarić et al, 2020; Motta et al, 2020).

Product packaging

Similar to personalized facts, we could also see more complete product labeling, thus allowing the consumer to more clearly see the environmental impact of their personal choices. For example, food items are often mandated to contain key information facilitating the consumer to assess how the item impacts their health (i.e sugar content, recommended daily allowances). However, there is no such information that facilitates the consumer to quickly assess how the item impacts the environment. One of the key challenges with the climate crisis is that it is difficult to see the causes. With the naked eye, we can't see the accumulation of greenhouse gases in our atmosphere. And when we purchase a product from the supermarket, we cannot see the acres of carbon-capturing trees that may have been destroyed to produce said product.

Experiments exploring different product packaging could be interesting grounds for further research. One might hope that this could reconnect the consumer with the impact of their purchase and thus reduce the feeling that their personal actions don't have a significant impact. Useful preliminary research may include experiments with cigarette packaging (Heydari et al, 2011; Al-Hamdani, 2013; Scheffels et al, 2013; Mays et al, 2015; Brewer et al, 2016; Shadel et al, 2019) and food labelling (Sacks et al, 2009; Cortina-Mercado, 2017; Pramudya et al, 2019; Croker et al, 2020; Jáuregui et al, 2020; Ikonen et al, 2020). One may also want to look into the middle man effect, which suggests that consumers are less likely to support unethical business practices if they feel more connected to the source of an item and its manufacturing processes (Macdonald, 2020a). More generally, one may want to investigate a range of psychological research that links forms of disconnection to increased unethical behaviour (Sherif et al, 1961; Milgram, 1963; Latané et al, 1969; Valentine, 1980; Bandura, 1992; Baillon et al, 2012; Brody et al, 2016; Cieciora, 2016; Macdonald, 2019; Macdonald, 2020b-f).

Simplification

One of the things that make the climate issue so difficult from a psychological perspective is that it touches many aspects of life. As a result, it can become overwhelming for the individual who wants to do their part. This could result in a form of paralysis by analysis or simply losing motivation as the overall goal can seem unachievable if presented as a long list of to-do items. Therefore, perhaps it is best to start by focusing first and foremost on the main climate offenders (animal products, fossil-fuel travel, and overconsumption) before expanding the circle. The idea being that this could maximize impact, increase the success rate, and help the individual build up momentum. Optimizing climate action strategies in this nature could be another interesting area for further research. Focusing on the main offenders may help the participant feel as though they are having a measurable impact as well as limiting the amount of effort required. It may also assist in reducing the possibility of choice overwhelm or paralysis by analysis (Wright, 1975; Keller et al, 1987; Holbrook et al, 1993; Dhar, 1997; Dhar, 1999; Iyengar, 2000; Swait et al, 2001; Schwartz, 2006; Piasecki et al, 2011; Condon, 2014; Kurien et al, 2014; Parvini, 2015; Jessup et al, 2019).

Concluding remarks

When tackling the climate crisis we will need to bust a series of dangerous myths: that we should live as though there is no tomorrow, that pollution is a victimless crime, that we can maintain perpetual growth on a finite planet with finite resources. And perhaps the most dangerous myth of all—one that can become self-fulfilling—that we cannot personally make a significant positive difference.

To achieve the status of a truly sustainable species we need to realize that what we do or don't do has significant consequences for those around us, the environment, and generations to come; we'll need to acknowledge that we aren't an array of atomized, insignificant individuals in standalone bubbles, but are instead a highly social species that form part of a complicated web of interconnections far beyond our own limited perspective.

References:

- Al-Hamdani M. 2013. The effect of cigarette plain packaging on individuals' health warning recall. *Healthcare policy = Politiques de sante* 8:(3) 68-77 [ncbi.nlm.nih.gov/pmc/articles/PMC3999559](https://pubmed.ncbi.nlm.nih.gov/pmc/articles/PMC3999559)
- Amelung D, Fischer H, Kruse L, Sauerborn R. 2016. Defogging Climate Change Communication: How Cognitive Research Can Promote Effective Climate Communication. *Frontiers in Psychology* 7: 1340 doi.org/10.3389/fpsyg.2016.01340
- Baillon A, Asli S, Van Dolder D. 2012. On the Social Nature of Eyes: The Effect of Social Cues in Interaction and Individual Choice Tasks. *Evolution and Human Behavior* 34:(2) 146-154 ssrn.com/abstract=2205072
- Bandura A. 1992. Social cognitive theory of social referencing, in: S. FEINMAN (Ed.) *Social Referencing and the Social Construction of Reality in Infancy*. New York: Plenum 175-20 doi.org/10.1007/978-1-4899-2462-9_8
- Barragan RC, Dweck CS. 2014. Reciprocity triggers children's benevolence. *Proceedings of the National Academy of Sciences* 111:(48) 17071-17077 doi.org/10.1073/pnas.1419408111
- Baumer EPS, Polletta F, Pierski N, Gay GK. 2017. A Simple Intervention to Reduce Framing Effects in Perceptions of Global Climate Change. *Environmental Communication* 11:(3) 289-310 doi.org/10.1080/17524032.2015.1084015

- Braje TJ, Erlandson JM. 2013. Human acceleration of animal and plant extinctions: a Late Pleistocene, Holocene, and Anthropocene continuum. *Anthropocene* 4: 14-23 doi.org/10.1016/j.ancene.2013.08.003
- Brewer NT, Hall MG, Noar SM, Parada H, Stein-Seroussi A, Bach LE, Hanley S, Ribisl KM. 2016. Effect of Pictorial Cigarette Pack Warnings on Changes in Smoking Behavior: A Randomized Clinical Trial. *JAMA Intern Med* 176:(7) 905-912 doi.org/10.1001/jamainternmed.2016.2621
- Brody N, Vangelisti AL. 2016. Bystander intervention in cyberbullying. *Communication Monographs* 83:(1) 94-119 doi.org/10.1080/03637751.2015.1044256
- Burgess LG, Riddell PM, Fancourt A, Murayama K. 2018. The Influence of Social Contagion Within Education: A Motivational Perspective. *Mind, Brain, and Education* 12: 164-174 doi.org/10.1111/mbe.12178
- Burrell AL, Evans JP, De Kauwe MG. 2020. Anthropogenic climate change has driven over 5 million km² of drylands towards desertification. *Nat Commun* 11: 3853 doi.org/10.1038/s41467-020-17710-7
- Buttlar B, Rothe A, Kleinert S, Hahn L, Walther E. 2020. Food for Thought: Investigating Communication Strategies to Counteract Moral Disengagement Regarding Meat Consumption. *Environmental Communication* 1-14 doi.org/10.1080/17524032.2020.1791207
- Capstick SB, Whitmarsh L, Poortinga W, Pidgeon N, Upham P. 2015. International trends in public perceptions of climate change over the past quarter-century. *WIREs Climate Change* 6: 35-61 doi.org/10.1002/wcc.321
- Chadwick AE. 2017. Climate change communication, *Oxford Research Encyclopedia, Communication* 1-28 doi.org/10.1093/acrefore/9780190228613.013.22
- Christakis NA, Fowler JH. 2008. The collective dynamics of smoking in a large social network. *New England Journal of Medicine* 358: 2249-2258 doi.org/10.1056/NEJMsa0706154
- Christakis NA, Fowler JH. 2013. Social contagion theory: examining dynamic social networks and human behavior. *Statistics in medicine* 32:(4) 556-577 doi.org/10.1002/sim.5408
- Chryst B, Marlon J, Van Der Linden S, Leiserowitz A, Maibach E, Roser-Renouf C. 2018. Global Warming's "Six Americas Short Survey": Audience Segmentation of Climate Change Views Using a Four Question Instrument. *Environmental Communication A Journal of Nature and Culture* 12:(8) 1109-1122 doi.org/10.1080/17524032.2018.1508047
- Cieciura J. 2016. A Summary of the Bystander Effect: Historical Development and Relevance in the Digital Age. *Inquiries Journal* 8:(11) inquiriesjournal.com/a?id=1493
- Clayton S, Devine-Wright P, Stern P, Whitmarsh L, Carrico A, Steg L, Swim J, Bonnes M. 2015. Psychological research and global climate change. *Nature Clim Change* 5: 640-646 doi.org/10.1038/nclimate2622
- Clem KR, Fogt RL, Turner J, Lintner BR, Marshall GJ, Miller JR, Renwick JA. 2020. Record warming at the South Pole during the past three decades. *Nat Clim Chang* 10: 762-770 doi.org/10.1038/s41558-020-0815-z
- Condon BB. 2014. The Living Experience of Feeling Overwhelmed: A Parse Research Study. *Nursing Science Quarterly* 27:(3) 216-225 doi.org/10.1177/0894318414534487
- Cook J, Nuccitelli D, Green SA, Richardson M, Winkler B, Painting R, Way R, Jacobs P, Skuce A. 2013. Quantifying the consensus on anthropogenic global warming in the scientific literature. *Environmental Research Letters* 8:(2) opscience.iop.org/article/10.1088/1748-9326/8/2/024024/meta
- Cook J, Oreskes N, Doran PT, Anderegg WRL, Verheggen B, Maibach EW, Carlton JS, Lewandowsky S, Skuce AG, Green SA, Nuccitelli D, Jacobs P, Richardson M, Winkler B, Painting R, Rice K. 2016. Consensus on consensus: a synthesis of consensus estimates on human-caused global warming. *Environmental Research Letters* 11:(4) doi.org/10.1088/1748-9326/11/4/048002
- Cortina-Mercado M. 2017. Effect of Packaging Design in the Purchase Decision Process: A Comparison of Generations. *Global Journal of Business Research* 11:(2) 11-26 ssrn.com/abstract=3041635
- Croker H, Packer J, Russell S, Stansfield C, Viner RM. 2020. Front of pack nutritional labelling schemes: a systematic review and meta-analysis of recent evidence relating to objectively measured consumption and purchasing. *J Hum Nutr Diet* 33: 518-537 doi.org/10.1111/jhn.12758
- Dhar R. 1997. Consumer preference for a no-choice option. *Journal of Consumer Research* 24:(2) 215-231 doi.org/10.1086/209506
- Dhar R, Nowlis S. 1999. The effect of time pressure on consumer choice deferral. *Journal of Consumer Research* 25:(4) 369-384 doi.org/10.1086/209545
- Feldman L, Nisbet MC, Leiserowitz A, Maibach EW. 2010. The climate generation? Survey analysis of the perceptions and beliefs of young Americans. Joint Report of American University's School of Communication, The Yale Project on Climate Change, and George Mason University's Center for Climate Change Communication 1-23 climatecommunication.yale.edu/publications/the-climate-change-generatio

- Forster PM, Forster HI, Evans MJ, Matthew GJ, Jones CD, Keller CA, Lamboll RD, Quéré C, Rogelj J, Rosen D, Schleussner C, Richardson TB, Smith CJ, Turnock ST. 2020. Current and future global climate impacts resulting from COVID-19. *Nat Clim Chang* doi.org/10.1038/s41558-020-0883-0
- Gifford R. 2011. The dragons of inaction: Psychological barriers that limit climate change mitigation and adaptation. *American psychologist* 66:(4) 290-302 doi.org/10.1037/a0023566
- Goldberg MH, Gustafson A, Ballew MT, Rosenthal SA, Leiserowitz A. 2019a. A social identity approach to engaging Christians in the issue of climate change. *Science Communication* 41:(4) 442-463 doi.org/10.1177/1075547019860847
- Goldberg MH, Van Der Linden S, Ballew MT, Rosenthal SA, Gustafson A, Leiserowitz A. 2019b. The experience of consensus: Video as an effective medium to communicate scientific agreement on climate change. *Science Communication* 41:(5) 659-673 doi.org/10.1177/1075547019874361
- Hamlin JK, Wynn K, Bloom P. 2007. Social evaluation by preverbal infants. *Nature* 450:(7169) 557-559 doi.org/10.1038/nature06288
- Hamlin JK, Wynn K. 2011. Young infants prefer prosocial to antisocial others. *Cognitive development* 26:(1) 30-39 doi.org/10.1016/j.cogdev.2010.09.001
- Hansen J, Ruedy R, Sato M, Lo K. 2010. Global surface temperature change. *Rev Geophys* 48: RG4004 doi.org/10.1029/2010RG000345
- Heydari GR, Ramezankhani A, Talischi F. 2011. The impacts of cigarette packaging pictorial warning labels on smokers in the city of tehran. *Tanaffos* 10:(1) 40-47 ncbi.nlm.nih.gov/pmc/articles/PMC4153127
- Holbrook MB, Gardner MP. 1993. An Approach to Investigating The Emotional Determinants of Consumption Durations. *Journal of Consumer Psychology* 2:(2) 123-142 doi.org/10.1016/S1057-7408(08)80021-6
- House T. 2011. Modelling behavioural contagion. *Journal of the Royal Society, Interface* 8:(59) 909-912 doi.org/10.1098/rsif.2011.0014
- Ikonen I, Sotgiu F, Aydinli A, Verlegh PWJ. 2020. Consumer effects of front-of-package nutrition labeling: an interdisciplinary meta-analysis. *J. of the Acad. Mark. Sci* 48: 360-383 doi.org/10.1007/s11747-019-00663-9
- Iyengar SS, Lepper MR. 2000. When choice is demotivating: Can one desire too much of a good thing? *Journal of Personality and Social Psychology* 79:(6) 995-1006 doi.org/10.1037/0022-3514.79.6.995
- Jarić I, Bellard C, Courchamp F, Kalinkat G, Meinard Y, Roverts DL, Correia RA. 2020. Societal attention toward extinction threats: a comparison between climate change and biological invasions. *Sci Rep* 10: 11085 doi.org/10.1038/s41598-020-67931-5
- Jáuregui A, Vargas-Meza J, Nieto C, Contreras-Manzano A, Alejandro NZ, Tolentino-Mayo L, Hall MG, Barquera S. 2020. Impact of front-of-pack nutrition labels on consumer purchasing intentions: a randomized experiment in low- and middle-income Mexican adults. *BMC Public Health* 20: 463 doi.org/10.1186/s12889-020-08549-0
- Jessup RK, Ritchie LE, Homer J. 2019. Hurry up and decide: Empirical tests of the choice overload effect using cognitive process models. *Decision* 7:(2) 137-152 dx.doi.org/10.1037/dec0000115
- Kahan DM, Jenkins-Smith H, Braman D. 2010. Cultural cognition of scientific consensus. *J Risk Res* 14: 147-174 doi.org/10.1080/13669877.2010.511246
- Keller KL, Staelin R. 1987. Effects of Quality and Quantity of Information on Decision Effectiveness. *The Journal of Consumer Research* 14:(2) 200-213 doi.org/10.1086/209106
- Koneswaran G, Nierenberg D. 2008. Global farm animal production and global warming: impacting and mitigating climate change. *Environmental health perspectives* 116:(5) 578-582 doi.org/10.1289/ehp.11034
- Kurien R, Rao Paila A, Nagendra A. 2014. Application of Paralysis Analysis Syndrome in Customer Decision Making. *Procedia Economics and Finance* 11: 323-334 doi.org/10.1016/S2212-5671(14)00200-7
- Latané B, Darley J. 1969. Bystander "Apathy". *American Scientist* 57:(2) 244-268 jstor.org/stable/27828530
- Lee T, Markowitz E, Howe P, Ko C, Leiserowitz A. 2015. Predictors of public climate change awareness and risk perception around the world. *Nature Clim Change* 5: 1014-1020 doi.org/10.1038/nclimate2728
- Le Page M. 2015. What is the Paris climate agreement? *New Scientist* Dec 12 newscientist.com/article/dn28663-what-is-the-paris-climate-agreement
- Leiserowitz A, Maibach E, Rosenthal S, Kotcher J, Ballew M, Goldberg M, Gustafson A. 2018. Climate change in the American mind: December 2018. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication. climatecommunication.yale.edu/wp-content/uploads/2019/01/Climate-Change-American-Mind-December-2018.pdf

- Leiserowitz A, Maibach E, Roser-Renouf C, Feinberg G, Rosenthal S. 2016. Climate change in the American mind. Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication 1-49 climatecommunication.yale.edu/publications/climate-change-in-the-american-mind-data-tools-and-trends
- Leiserowitz A, Smith N, Marlon JR. 2010. Americans' knowledge of climate change. Yale University. New Haven, CT: Yale Project on Climate Change Communication 1-58 climatecommunication.yale.edu/publications/americans-knowledge-of-climate-change
- Macdonald C. 2019. Money, A Disconnecting Agent: Reminders of money trigger a feeling of disconnection which increases the likelihood of unethical decisions. *The Open Science Journal* 4:(1) 1-10 doi.org/10.23954/osj.v4i1.2200
- Macdonald C. 2020a. The Middleman Effect: The ethical consequences of paying others to act on your behalf. *The Open Science Journal* 5:(1) 1-10 doi.org/10.23954/osj.v5i1.2377
- Macdonald C. 2020b. Graphical Connection Priming and Ethics: As our sense of human connection decreases, so too does ethical decision-making. *The Open Science Journal* 5:(1) 1-6 doi.org/10.23954/osj.v5i1.2275
- Macdonald C. 2020c. Lexicon Connection Priming and Ethics: As our sense of human connection decreases, so too does ethical decision-making. *The Open Science Journal* 5:(1) 1-7 doi.org/10.23954/osj.v5i1.2276
- Macdonald C. 2020d. The Gilgamesh Effect: The ethical consequences of disconnection. *The Open Science Journal* 5:(2) 1-6 doi.org/10.23954/osj.v5i2.2316
- Macdonald C. 2020e. The Avatar Effect: The harmful consequences of decision-making through a 'separate' entity. *The Open Science Journal* 5:(3) 1-9 doi.org/10.23954/osj.v5i3.2380
- Macdonald C. 2020f. Avatars, Disconnecting Agents: Exploring the nuances of the avatar effect in harmful online discourse. *The Open Science Journal* 5:(2) 1-8 doi.org/10.23954/osj.v5i2.2385
- Machovina B, Feeley KJ, Ripple WJ. 2015. Biodiversity conservation: The key is reducing meat consumption. *Science of Total Environment* 536: 419-431 ncbi.nlm.nih.gov/pubmed/26231772
- Mays D, Niaura RS, Evans WD, Hammond D, Luta G, Tercyak KP. 2015. Cigarette packaging and health warnings: the impact of plain packaging and message framing on young smokers. *Tobacco control* 24:(e1) 87-92 doi.org/10.1136/tobaccocontrol-2013-051234
- McCright A, Xiao C, Dunlap R. 2013. Political polarization on support for government spending on environmental protection in the USA, 1974–2012. *Soc Sci Res* 48: 251-260 doi.org/10.1016/j.ssresearch.2014.06.008
- Milgram S. 1963. Behavioral Study of obedience. *The Journal of Abnormal and Social Psychology*, 67:(4) 371-378 doi.org/10.1037/h0040525
- Motta M, Ralston R, Spindel J. 2020. A Call to Arms for Climate Change? How Military Service Member Concern About Climate Change Can Inform Effective Climate Communication. *Environmental Communication* 1-14 doi.org/10.1080/17524032.2020.1799836
- National Research Council. 2011. America's Climate Choices. National Academies Press nap.edu/read/12781/chapter/1
- Nisbet MC, Myers T. 2007. Twenty years of public opinion about global warming. *Public Opinion Quarterly* 71: 444-470 jstor.org/stable/4500386?seq=1
- Pandve HT, Chawla PS, Fernandez K, Singru SA, Khismatrao D, Pawar S. 2011. Assessment of awareness regarding climate change in an urban community. *Indian journal of occupational and environmental medicine* 15:(3) 109-112 doi.org/10.4103/0019-5278.93200
- Parvini N. 2015. "'And Reason Panders Will': Another Look at Hamlet's Analysis Paralysis". *Shakespeare and Cognition: Thinking Fast and Slow through Character*. Palgrave Macmillan UK 52-62 doi.org/10.1057/9781137543165_5
- Piasecki M, Hanna S. 2011. A Redefinition of the Paradox of Choice. In: Gero J.S. (eds) *Design Computing and Cognition '10*. Springer, Dordrecht 10: 347-366 doi.org/10.1007/978-94-007-0510-4_19
- Plötner M, Over H, Carpenter M, Tomasello M. 2015. Young children show the bystander effect in helping situations. *Psychological Science* 499-506 doi.org/10.1177/0956797615569579
- Poore J, Nemecek T. 2019. Reducing food's environmental impacts through producers and consumers. *Science* 360:(6392) 987-992 doi.org/10.1126/science.aag0216
- Powell J. 2016. The consensus on anthropogenic global warming matters. *Bulletin of Science, Technology & Society* 36:(3) 157-163 doi.org/10.1177/0270467617707079
- Powell J. 2017. Scientists Reach 100% Consensus on Anthropogenic Global Warming. *Bulletin of Science, Technology & Society* 37:(4) 183-184 doi.org/10.1177/0270467619886266
- Pramudya RC, Seo HS. 2019. Hand-Feel Touch Cues and Their Influences on Consumer Perception and Behavior with Respect to Food Products: A Review. *Foods (Basel, Switzerland)* 8:(7) 259 doi.org/10.3390/foods8070259
- Ritchie H. 2020. You want to reduce the carbon footprint of your food? Focus on what you eat, not whether your food is local. *Our World In Data*, Oxford Jan 24 ourworldindata.org/food-choice-vs-eating-local#licence

- Romsdahl RJ, Wood RS, Harsell DM, Hultquist A. 2019. Framing local climate change policies in the US Great Plains. *Journal of Environmental Policy & Planning* 21:(6) 734-753 doi.org/10.1080/1523908X.2019.1673154
- Rudman LA, McLean MC, Bunzl M. 2013. When truth is personally inconvenient, attitudes change: The impact of extreme weather on implicit support for green politicians and explicit climate-change beliefs. *Psychol Sci* 24: 2290-2296 doi.org/10.1177/0956797613492775
- SA. 2019. What causes ocean dead zones. *Scientific American* May 4 scientificamerican.com/article/ocean-dead-zones
- Sacks G, Rayner M, Swinburn B. 2009. Impact of front-of-pack 'traffic-light' nutrition labelling on consumer food purchases in the UK. *Health Promotion International* 24:(4) 344-352 doi.org/10.1093/heapro/dap032
- Scheffels J, Lund I. 2013. The impact of cigarette branding and plain packaging on perceptions of product appeal and risk among young adults in Norway: A between-subjects experimental survey. *BMJ Open* 3: e003732 doi.org/10.1136/bmjopen-2013-003732
- Schneider CR, Zaval L, Weber EU, Markowitz EM. 2017. The influence of anticipated pride and guilt on pro-environmental decision making. *PLoS ONE* 12:(11) e0188781 doi.org/10.1371/journal.pone.0188781
- Schwartz B. 2006. More Isn't Always Better. *Harvard Business Review* June hbr.org/2006/06/more-isnt-always-better
- Shadel WG, Martino SC, Setodji CM, Dunbar M, Scharf D, Creswell KG. 2019. Do graphic health warning labels on cigarette packages deter purchases at point-of-sale? An experiment with adult smokers. *Health Education Research* 34:(3) 321-331 doi.org/10.1093/her/cyz011
- Sherif M, Harvey OJ, White BJ, Hood WE, Sherif, CS. 1961. Intergroup conflict and cooperation: The Robbers Cave experiment. Norman: University of Oklahoma Book Exchange livros01.livrosgratis.com.br/ps000162.pdf
- Singer C, McCarthy J, Sanchez E. 2018. Countries of the paris climate agreement. *Global Citizen* Oct 12 globalcitizen.org/en/content/7-countries-paris-climate-agreement
- Spence A, Poortinga W, Butler C, Pidgeon NF. 2011. Perceptions of climate change and willingness to save energy related to flood experience. *Nature Clim Change* 1: 46-49 doi.org/10.1038/nclimate1059
- Spence A, Poortinga W, Pidgeon N. 2012. The psychological distance of climate change. *Risk Analysis: An International Journal* 32:(6) 957-972 doi.org/10.1111/j.1539-6924.2011.01695.x
- Sprague DA, House T. 2017. Evidence for complex contagion models of social contagion from observational data. *PLoS ONE* 12:(7) e0180802 doi.org/10.1371/journal.pone.0180802
- Swait J, Adamowicz W. 2001. The Influence of Task Complexity on Consumer Choice: A Latent Class Model of Decision Strategy Switching. *Journal of Consumer Research* 28:(1) 135-148 doi.org/10.1086/321952
- Taddicken M, Kohout S, Hoppe I. 2019. How Aware Are Other Nations of Climate Change? Analyzing Germans' Second-Order Climate Change Beliefs About Chinese, US American and German People. *Environmental Communication* 13:(8) 1024-1040 doi.org/10.1080/17524032.2018.1561483
- Turner J, Phillips T, Marshall GJ, Hosking JS, Pope JO, Bracegirdle TJJ, Deb P. 2017. Unprecedented springtime retreat of Antarctic sea ice in 2016. *Geophys Res Lett* 44: 6868-6875 doi.org/10.1002/2017GL073656
- TVC. 2019. How much have you saved? TVC May 4 thevegancalculator.com/#calculator
- UN. 2006. Livestock's Long Shadow: Environmental issues and options. United Nations: Food and Agriculture fao.org/3/a0701e/a0701e00.htm
- UN. 2015. Paris Agreement. The United Nations Dec 12 unfccc.int/sites/default/files/english_paris_agreement.pdf
- UN. 2018. Tackling the world's most urgent problem: meat. The United Nations Sep 26 un-environment.org/news-and-stories/story/tackling-worlds-most-urgent-problem-meat
- USGS. 2006. Pesticides in the Nation's Streams and Ground Water. USGS Mar pubs. usgs. Gov /fs /2006/3028
- Valentine ME. 1980. The attenuating influence of gaze upon the bystander intervention effect. *Journal of Social Psychology* 111:(2) 197 psycnet.apa.org/record/1981-25777-001
- Van Swol LM, Prahl A, Kolb M. 2019. The Effects of Discussion of Familiar or Non-Familiar Information on Opinions of Anthropogenic Climate Change. *Environmental Communication* 13:(8) 1128-1142 doi.org/10.1080/17524032.2019.1610022
- Vargo LJ, Anderson BM, Dadić R, Horgan HJ, Mackintosh AN, King AD, Lorrey AM. 2020. Anthropogenic warming forces extreme annual glacier mass loss. *Nat Clim Chang* doi.org/10.1038/s41558-020-0849-2
- Visser TAW, Roberts A. 2018. Automaticity of social cues: The influence of limiting cognitive resources on head orientation cueing. *Scientific Reports* 8:(10288) nature.com/articles/s41598-018-28548-x

- Wachholz S, Artz N, Chene D. 2014. Warming to the idea: University students' knowledge and attitudes about climate change, *International Journal of Sustainability in Higher Education* 15: 128-141 doi.org/10.1108/IJSHE-03-2012-0025
- WAF. 2019. Animal agriculture causing animal extinction. The World Animal Foundation May 4 worldanimalfoundation.org/articles/article/8949042/186425.htm
- Warneken F, Tomasello M. 2006. Altruistic Helping in Human Infants and Young Chimpanzees. *Science* 311:(5765) 1301-1303 doi.org/10.1126/science.1121448
- Whitmarsh L. 2009. What's in a name? Commonalities and differences in public understanding of 'climate change' and 'global warming'. *Public Underst Sci* 18: 401-420 doi.org/10.1177/0963662506073088
- Wright P. 1975. Consumer choice strategies: Simplifying vs. optimizing. *Journal of Marketing Research* 12:(1) 60-67 doi.org/10.2307/3150659