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Beliefs, values and emotions: An interactive approach to distrust in science

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ABSTRACT

Previous philosophical work on distrust in science has argued that understanding public distrust in science and scientific interventions requires that we pay careful attention not only to epistemic considerations (that is, beliefs about science), but also to values, and the emotional contexts in which assessments of scientific credibility are made. This is likely to be a truncated list of relevant factors for understanding trust/distrust, but these are certainly key areas of concern. The aim of this paper is not to further innumerate the list of relevant factors. Rather, it is to map the ways that these key areas (beliefs, values, and emotions) are related to each other. These are not distinct categories, but rather they interact, making our picture of distrust more complicated than we might otherwise imagine. This discussion will take place in the context of resistance to medical interventions. Notably, Ebola interventions in West Africa, HIV/AIDS testing in South Africa, and vaccines across the world.

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1. Introduction

Previous philosophical work on distrust in science has argued that we should pay careful attention not just to epistemic considerations – that is, beliefs people hold about science – but also to values (Goldenberg, 2021), and to the emotional contexts in which assessments of scientific credibility are made (Furman, 2020). This is especially salient in science-based health and medical interventions, where one's beliefs about medicine are formed and persist in situations where emotions are likely heightened and one's values can be at stake.¹

Suspicion of science and science-based interventions tend to be topic specific. I may be very worried about vaccines, but also enthralled by the details of the Mars mission. The kinds of cases of distrust that I am concerned with in this paper are those where

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individuals and/or groups are resistant to science-based medical or health-policy interventions. This is where a comprehensive account of the phenomenon will typically need to go beyond cold epistemology. Or to paraphrase Heidi Larson, an anthropologist who works on vaccine confidence across the world, understanding these cases requires that rationality not be used as a “blunt instrument” (Larson, 2020, p. 28). Examples of the kinds of cases I have in mind are vaccine hesitant parents across the world (Goldenberg, 2021), South Africans in the mid-2000s who were suspicious of HIV/AIDS testing and treatment programs (Fassin, 2007), West Africans who resisted Ebola interventions in the 2013–2016 outbreak (Fairhead, 2016) and later in the Democratic Republic of Congo (Congo Research Group, 2021), and Ugandans who refused treatment as part of mass anti-parasitic interventions (Parker et al., 2007). This is just to name a few of the kinds of cases I have in mind, but overall, I am concerned with distrust of medical interventions and public health policy.

“Beliefs”, “values” and “emotions” provide a potentially truncated list of relevant factors to better understand distrust in these cases, but these are certainly key areas of concern. The multi-dimensional nature of trust and distrust is well-recognized in the social sciences, and Pidgeon, Kaspron and Slovic warn social researchers against adopting an overly “naïve” view of trust (Pidgeon et al., 2003, pp. 1–10). My aim here is not to further innumerate the list of potentially relevant factors. Rather, it is to map ways that these key areas of concern (beliefs, values, emotions) relate to each other in order to further develop a more fine-grained account of distrust that is fit for use by practitioners who work in these contexts. Underpinning the picture presented in this paper is the view that these are not distinct categories. That is, beliefs, values and emotions do not exist in particular quantities, independently fluctuating depending on the scenario. Or, to use language more familiar to methodologists, these are not “independent variables”. They interact, making the picture of distrust more complicated than we might initially imagine.

To keep the discussion manageable for the purposes of this paper, I will address these interactions in pairwise combinations. That is, interactions between values and beliefs (section 3), emotions and beliefs (section 4), emotions and values (section 5). In reality, these interactions are likely messier and more complicated, with more interaction effects across categories – the pairwise categorization is merely an effort to ensure tractability and it is not intended to capture the full complexity of the phenomenon. In the final section (section 6), I will outline some potential upshots of this more interactive account of distrust. But before addressing the substantive issues of this paper, in the first section (section

2), I will provide more detail about the status of the theory I am developing here.

2. What kind of theory is this?

This paper aims to further refine a *theory* of distrust that is fit-for-purpose, such that it can be of greater use to practitioners who work with communities, particularly health practitioners implementing science-based policy interventions. This aim is different from Katherine Hawley's in *How to be trustworthy* (Hawley, 2019), where the task is to get the *concepts* of trust and trustworthiness right. Concepts are about defining and demarcating terms (Gerring, 1999, p. 358), addressing questions such as “what is objectivity”, “what is knowledge”, “what does justice require”, or “what is trust”. By contrast, theory, in one sense of the term, is about providing an explanation of a phenomenon or identifying factors that can help make better sense of a situation.² The aim in this paper, then, is to get a sense of what is happening in cases of distrust in health interventions, regardless of what the concept of trust *really* means.

We can see that better understanding distrust is a priority issue for medical practitioners and key organizations that work in these areas. In the *2020 –2023 MSF (Medicins Sans Frontiers) the United Kingdom and Ireland Strategic Direction Report*, mistrust is cited as an issue of concern (Medicins Sans Frontiers, 2023). In the 2017 World Health Organisation (WHO) *Vaccination and Trust* report, the authors are explicit at the start of the document that it was produced in response to requests from member states for more guidance about how respond to distrust in vaccination programs (World Health Organisation, 2017, p. 2).

Given that distrust is a priority concern for practitioners, how then do we go about developing a theory of distrust that is fit for this purpose? Ian Hacking advocates for doing philosophy at the “ground level” at the “sites of use” (Hacking, 2015, p. 20), by which he means being especially attentive to the work of practitioners and the specificities of cases of practice. He argues that philosophers need to “roll up their shirt sleeves” (paraphrasing Hacking) and get down to the dirty work of practice. This is an attractive image of how to do practically orientated philosophy – one in which philosophers work closely with the cases and embrace the mucky reality of the world.

Despite the attractiveness of Hacking's picture of doing philosophy at “the sites of use”, philosophical inquiry always involves some abstraction from the specificity of cases.³ Further, if the aim is to say something useful for practitioners, we need to move beyond the peculiarities of individual cases and operate somewhat at a remove from the ground-level, so that the theory can be used across cases. With this aim in mind, Nancy Cartwright

and Jeremy Hardie provide helpful advice. They make use of another metaphor, suggesting that we “climb the ladder of abstraction”, so that more can be said than just describing the details of specific individual cases (Cartwright & Hardie, 2012, p. 79). But how do we know how far up the ladder to climb from the particularity of the cases at the ground level that are being studied? The aim in this paper is to develop a Cartwrightian inspired mid-level theory, where a mid-level theory is:

[a] simple type of theory which can be used for partially explaining a range of different phenomena, but which makes no pretence of being able to explain all social phenomena . . . It is a vision of sociological theory as a toolbox of semigeneral theories each of which is adequate for explaining a limited range or type of phenomena. (Cartwright, 2020, p. 270 quoting Bearman and Hedström, 2011, p. 31)

The reason the theory needs to be “semi-general” is because no very general theory will capture the diversity of cases that are relevant here. There is no general theory of distrust that will capture the affluent vaccine hesitant mother in California and the woman who is hesitant about taking her sister to Ebola treatment center in Free Town, Sierra Leone. All we can aim for is an account that captures a range of relevantly similar cases. So, while more should be said than merely detailing the relevant cases, the theory ought not to be so ambitious that it ends up saying nothing useful for and about those cases.

Now that we have a sense of what kind of theory this paper is working toward, the rest of this paper will undertake that theorizing, addressing the pairwise interactions between these areas of concern. This starts with the interactions between values and beliefs.

3. Values and beliefs

In this section I start with the portion of the beliefs/values/emotions triad that is most discussed by philosophers of science. That is, the interaction effects between beliefs and values.⁴

3.1 *Scientific beliefs are value laden*

It is well-recognized in philosophy of science that the information produced by scientific inquiry is value-laden, and so our beliefs about science are also value-laden. Values are used to select which scientific projects to pursue, which methods to use, how to interpret data, and how to communicate research findings, amongst other decision points in the scientific process (Douglas, 2009; Longino, 1990). If members of the public are doubtful about the values that have been used along the way, this can cast suspicion on the scientific outputs.

Philip Kitcher (2011) argues that the credibility of science is eroded when “opaque value judgments” are involved in the scientific process, by which he means that the public is concerned that the values used run counter to those that would be democratically selected (Kitcher, 2011, p. 155). I suspect that Kitcher’s insight is right, but should be expanded to more fully capture the phenomenon, such that members of the public become suspicious of scientific findings when the values run counter to their *own* individual values, even if these are not the values that would be chosen democratically. Consider the case of the 2019 measles outbreak in New York’s Orthodox Jewish Community. Here, the vaccine resistance that underlay the outbreak was a suspicion that the vaccines include pork products or by-products (McAteer et al., 2020, p. 704). Even though strict kosher requirements are unlikely to be democratically supported in contemporary New York, the belief was that a core value in this community had been undermined, which in turn eroded trust in the scientific product – that is, the vaccine. This had very real consequences in the form of a measles outbreak in New York.

The picture of the relationship between facts, values and distrust is more complicated still when we look at the ways science travels from the laboratory to policy interventions. Most of us do not receive our “science” directly from the scientists. Rather, we are at the endpoint of a series of decisions made by a long list of intermediaries, each of which adds an extra layer of value, and sometimes the values can take precedence over the scientific findings. One case where we see something like this afoot was the 2013 Obama administration’s decision-making over the introduction of a minimum age requirement of 15 for young women to access the morning after pill (emergency contraception) without a doctor’s prescription. The medical consensus was that the morning after pill was safe for 14-year-olds, and the political decision to introduce an age requirement was ultimately overturned by the courts as political overreach, describing it as “politically motivated” and “scientifically unjustified” (Parkhurst, 2017, p. 42). In Justin Parkhurst’s commentary on the example, he points out that there are deeper issues here than just what the science deems safe. Rather, there are also discussions to be had about when something is a political issue rather than a strictly scientific one (Parkhurst, 2017, p. 42). The point here is not to reopen the philosophical debates over the role of scientists in policy making, it is just to note that by the time scientific information reaches us in the form of policy, it has been further imbued with values.

The further value-ladenness of our science does not end with policy-makers. Rather, health practitioners (i.e., doctors and nurses) go on to interpret policies within their practice, and make value-judgments in their interpretation and implementation of policy. Again, if individuals are suspicious of values at any step in this process, this places the uptake of science-based policy on shakier ground. We see this in the case of the introduction

of the contraceptive pill in African American communities, as discussed by Naomi Scheman and Heidi Grasswick (Grasswick, 2010, p. 391; Scheman, 2001). In this case, women were suspicious of the pill, not because they distrusted the “science” per se – they thought it was likely an effective contraceptive. Rather, they were concerned about why the pill was recommended to *them*, as African American women. Here, the worry is about potentially racist values of both policy makers and medical practitioners.

This section has given a brief tour of material with which many readers are likely already familiar. The punchline is that the information we receive about science is influenced by values. Here “scientific information” is a broad category, including not only the information we might get about scientific findings (likely via the media, given that most ordinary citizens do not read science journals or attend conferences), but also in the form of policy guidance and medical advice.

3.2. Values and information responsiveness

Section 3.1. describes how values influence the information that we receive, and thus our beliefs about science. However, values are not fixed and unchangeable. One way that values change is in response to new information. This means that not only is scientific information value-laden, but that values are also science-responsive (Anderson, 2004, p. 2; Brown, 2020, pp. 91–92), thus providing us with a neat symmetry in our interactive mapping.

The example that Elizabeth Anderson uses to make this point is that of the social scientific research on divorce, where divorce was initially viewed as a social bad typified by “trauma” and “loss”. However, research went on to show that the ways women came to see divorce as a “new beginning”, and they could reimagine their family structures moving forward, both of which are positive features that undermine the previous view of divorce as a social bad. Thus, the social science research contributed to shifting values over time. Or to use an example from Matthew Brown, historically it may have been permissible to treat animals as mere “automata” (using his term), but as more research has been done on animal sentience and their experience of pain, so our views on the value of animals has changed (Brown, 2020, p. 92). Here, again, science shifted the values.

While recognizing that values are changeable in response to new information helps to contribute to the completeness of the picture in the interactive account of distrust, the upshot of this for distrust of science-based policy is not obvious. The adaptability of values might not be helpful in policy efforts to shift public distrust in science-based interventions, given that science is not always well-positioned for value-shifting. Kitcher (2011) describes something akin to this problem as one

of “chimeric epistemologies”, whereby different groups have different evidentiary rules, making disagreements between these groups irresolvable. Kitcher’s example of this that of public debates about the origins of the universe and of human life. Some would cite evolutionary science and its associated texts as the evidentiary standard, while others would cite the Christian creation story and its associated religious texts at the correct evidentiary standard. Providing the creationist with more evolutionary science is unlikely to shift their view, just like it is unlikely that the evolutionary scientist’s view will be shifted by providing them with more religious texts (Kitcher, 2011, pp. 155–161).

Returning to New York’s Orthodox Jewish community and 2019 measles outbreak, we can see why the information-responsiveness of some values may not be an especially helpful insight in the cases of public distrust that are discussed in this paper, due to the chimeric epistemologies issue identified by Kitcher. In this example, providing more complete information on the vaccination program – that is, the science behind the vaccine and the public health rationale for the structure of that specific scheme – is unlikely to shift adherence away from kosher regulations, because these two groups are essentially having different conversations. “What does the religious text say?”, versus “what is public health best practice?”. That is not to say that all cases are like that of the New York measles outbreak example, it is merely to warn policy makers that although values can be information-responsive, the information needs to be of the right sort – that is, it needs to address the value issue on its own terms. Further, it will not always be morally appropriate to try and shift people’s values – assessing when and where it will be appropriate or permissible to attempt interventions on values will be the work of moral and political philosophers.

In [Section 3](#) we have seen that values impact on our information, and that information can shift our values. This is the first portion of our pairwise interactions.

4. Emotions and beliefs

The kinds of cases under consideration in this paper are about health, medicine and disease. These cases rarely take place in emotionally neutral contexts. Rather, these are situations where fear, anger, frustration, sadness, and grief are all normal emotional responses (Watts, 1999). The literature on emotions typically distinguishes between *emotions* and *affect*. Emotions are usually described as intentional. That is, directed toward agents and/or objects – for instance, I was angry *at* the man. Affect is a more generalized mood – I was overcome by a sense of melancholy (Fischer, 2016, p. 817; Nussbaum, 2001, p. 23–24). Nothing in this paper hangs on there being a hard distinction between affect and emotion, and in many of the cases

under consideration, both will be at play and will be relevant. In these cases, it is likely for us to experience complicated and “blended” emotional states (Smith & Ellsworth, 1987, p. 476). Given the muddled way in which we experience the world, in this paper there will be some slippage between how the terms “affect” and “emotion” are used here.

The most obvious interaction effect between beliefs and emotions is that information about health threats can give rise to negative emotional responses. News of a pandemic outbreak can make us afraid. Further, that information goes into a preexisting emotional context – perhaps I am already angry and frustrated about how difficult it is for me to access medical care. This affective stew then has impacts on the way that we relate to evidence and information. This section looks at three ways that emotional/affective context can impact beliefs and facts in the kinds of cases under consideration. [Section 4.1](#) looks at the ways that emotions impact our assessments of the evidence. [Section 4.2](#) looks at the ways that emotions may contribute to independent evidence gathering practices. And [section 4.3](#) notes the connection between emotion and information transfer, especially in situations where there are rumors. Importantly, to say that emotions are involved in these cases is not to dismiss them as irrational. Sometimes emotions can help us get to exactly the right answers. Nomy Arpaly (2000), for instance, discusses a case in which a woman decides to leave her husband while she is in a feverish state of agitation in the middle of the night (p. 499). Arpaly takes this to be exactly the right decision for the woman, and there is nothing about the affectively heightened state in which she made the decision that undermines that – later, in [section 5.2](#), we will see that emotions can help us figure out what is important to us (i.e., they can do evaluative work).

4.1 Emotions and evidence assessment

Nussbaum (2001) tells us that the intentional nature of emotions – the way they are directed at things in the world – is closely tied to the way we view and interpret the thing our emotions are about:

This aboutness comes from my active ways of seeing and interpreting: it is not like being given a snapshot of the object, but requires looking at the object, so to speak, through one’s own window. This perception might contain an accurate view of the object, or it might not. (Nussbaum, 2001, p. 28)

It is well-recognized in the psychological literature that our emotional states influence how we assess the evidence that is available to us – or to use language more familiar in psychological literature, emotion impacts the ways in which we “appraise” things (Smith & Ellsworth, 1987). In angry states we are more likely to look for a human agent to blame. In situations of

fear, we are likely to add more weight to risks (Bardon, 2020, p. 17–18). Given that we know that fear and anger are rife in these emotionally heightened cases discussed here, it is likely that these emotions impact on the ways that people view the evidence that is available to them and can help us better understand aspects of our cases of interest. Stephen John, for example, asks why it is that parents add so much additional weight to the risks for their own children when deciding whether to vaccinate, given how low the risks are at the population level (John, 2020, p. 58). However, if parents are making these decisions in contexts of fear, then paying extra attention to the risks to their own children is to be expected and isn't a surprising feature of the phenomenon.

4.2. *Emotions and independent evidence gathering*

A note-worthy feature of various groups who are suspicious of particular scientific issues is that they are often the best-read people in the room on those topics. They have done the most independent evidence-gathering. For instance, a group of concerned parents in Britain in the early 1990s believed that their worries about the potential adverse effects of vaccines were not being taken seriously. In response, they organized their own “citizen-science” epidemiological study on the topic (Goldenberg, 2021, p. 35). Similarly, when Thabo Mbeki (President of South Africa in 1999–2008) started becoming suspicious of the causal connection between HIV and AIDS – a suspicion that went on to define South Africans AIDS policy in the early 2000s and resulted in hundreds of thousands of deaths – he undertook substantial independent evidence-gathering. His independent research was so extensive that in January 2000 he sent a dossier of over fifteen hundred pages of non-mainstream AIDS information to the head of the South African Medical Research Council (Gevisser, 2007, p. 742).

This behavior looks mysterious. Understanding science is extremely difficult and why would anyone trust themselves to do this work, without relevant background training and skills? Or, at least this is the question that Ward Jones asked, when writing specifically about the case of Thabo Mbeki's AIDS denialism (Jones, 2002). Again, paying attention to the emotional context can potentially assist our understanding. Mary Carman, in the philosophical literature, notes that anger can increase one's sense of self-certainty (Carman, 2022, p. 54). Similarly, in the psychological literature, Paul Litvak and colleagues, in their work on anger and decision making, argue that: “[a]nger makes people . . . indiscriminately optimistic about their own chances of success . . . and eager to take action” (Litvak et al., 2010, p. 288). Another notable feature of Litvak *et al*'s account is that the anger need not be directed at the thing that one then wants to act on and feels self-

assured about. Rather, one just needs to be in a state of anger (potentially caused by something else entirely) to experience these effects.

Both cases described earlier in this section can be viewed as involving anger. Parents were potentially angry that their worries had not been taken seriously. On some accounts, Mbeki was angry because the mainstream scientific accounts of the disproportionate impact of HIV/AIDS in Sub-Saharan Africa seemed to rely on racist beliefs about Africans and their sexuality (Fassin, 2007). Once we pay attention to the role of anger, then it becomes more understandable that individuals and groups can be buoyed into the sense of greater self-assurance that this kind of independent research requires.

Pointing to anger is not intended to be a knock-down argument in helping us understand the peculiar features of these cases. This explanation has obvious flaws. For one, I have no access to the internal emotional states of vaccine hesitant British parents in the 1990s, or Thabo Mbeki as he undertook his extensive independent research on the causal relationship between HIV and AIDS. They may have been angry, or they may have been something else entirely. Second, the psychological research on this indicates subtle differences in the ways that people experience and are impacted by anger. For instance, work by Ferrer *et al* suggests that there are gendered differences in the ways that anger impacts appraisal (Ferrer et al., 2017). Notably, while men and women may get equally angry in response to transgressions, men tend to experience more of the enhanced sense of control that anger can provoke, which is closely related to the increased sense of self-assurance associated with anger (Ferrer et al., 2017, p. 524). And so, we should be cautious about saying that *everyone* experiences more self-certainty while in angry states. Given these problems with using anger to explain these specific cases of independent evidence-gathering, why bother? The point is to indicate the ways that emotions *can* shift how people view scientific information. Here, it is worth noting that anger *can* increase people's sense of self-assurance and that is a helpful piece of information to have in our mapping, even if it may not be the one true explanation of our illustrative cases.

4.3. Emotions and rumors

Another typical feature of crises in general, and health crises in particular, is that rumors are rife. Rumors are pieces of unofficial information that are passed through peer networks (Coady, 2006, p. 48). In South Africa, in the mid-2000s, rumor had it that HIV/AIDS testing programs were really a plot by members of the old apartheid regime to infect black South Africans with the virus – that the doctors were infecting people with their needles, rather than testing them (Steinberg, 2016, p. 67). In Uganda in 2004, when people

were distrustful of a large-scale anti-parasitic program, rumors were that the Ugandan and American governments were colluding to reduce the birth rates of Africans, and that the anti-parasitic would really make people infertile (Parker et al., 2007, p. 168). In West Africa, when there was resistance to the international interventions during the 2013–2016 Ebola crisis, rumors were that patients' bodies were being taken so that their organs could be harvested and sold on the international black market (Desclaux et al., 2017, p. 218). In all these cases, rumors undermined trust in the health interventions and ultimately limited their uptake.

There is a well-documented relationship between emotions and the spread of rumors. Heidi Larson (2020) describes Allsop and Post's classic work on rumors during World War II and its implications as follows:

[T]hey put forward a “Basic Law of Rumor” stating that the intensity and spread of rumor depends on the perceived importance of the rumor multiplied by the ambiguity of the evidence. They describe this “perceived importance” not as a rational assessment, but rather as an emotional state. “At times”, they write, “the relationship between the interest and the rumor is so intimate that we may describe the rumor simply as a projection of an altogether subjective emotional condition.” Managing rumors is about understanding and managing the emotions that drive them, not attempting to judge whether they are true or false. (Larson, 2020, p. 3)

Given the impact of emotions on rumors, and the role of rumors in undermining public health information and interventions, this is an important interaction effect between emotions and scientific information for understanding distrust.

Each of these three sub-sections – on evidence assessment (4.1), evidence gathering (4.2), and information transmission in the form of rumors (4.3) – are brief, and more could be said about them each individually. The aim is simply to give the reader a sense of the way that emotions/affect can impact on the information that is available to people in practice.

5. Emotions and values

This section will look at the final pairwise set in our interactive mapping. That is, how values and emotions interact in these cases. First, that value contraventions can trigger negative emotional responses (section 5.1.), and second, that emotions can be indicative that a value boundary has been crossed (section 5.2).

5.1 Value contraventions and emotions

Peter Strawson, in his (1962) essay, “Freedom and Resentment”, argues that violations of moral norms trigger negative reactive attitudes toward the norm violator. He takes this to be fundamental to the operation of

ethics in society. For instance, we may feel resentment toward someone who knowingly harms us – in his example, someone who intentionally tramples your hand (who you would be right to feel negatively toward), versus someone who accidentally steps on your hand (and who it would be less appropriate for you to have negative reactive attitudes toward) (Strawson, 1962). The philosophical point here is that value contraventions can and do elicit negative emotional responses, and that this is appropriate. The idea that contravening value-lines results in negative reactive attitudes also appears in the sociological explanations of distrust across a range of cases, some of which are listed below. It should be noted that I am in no way suggesting that there is a direct connection between the philosophical literature on reactive attitudes and the sociological literature on distrust. But it is striking that the sociological accounts are so similar to those that are already philosophically familiar.

James Fairhead (2016), in his discussion of resistance to Ebola interventions in Guinea, argues that international interventions during the crisis crossed certain “red lines” of value accommodation⁵ that had existed before the outbreak. For instance, prior to the epidemic, families had been allowed to accompany sick relatives into the hospital, and traditional burial practices were respected. It wasn’t possible to continue with these practices under quarantine conditions. Fairhead explicitly notes the connections between value violations and emotional responses here:

[t]ransgressive situations documented here evoked emotive responses to the perceived immorality and improprieties that were strong enough to cause flight, resistance, and murder. (Fairhead, 2016, p. 25)

Heidi Larson, the anthropologist of global vaccine confidence whose work has been mentioned earlier in this paper, documents a similar phenomenon in the cases of Kenyan resistance to the Tetanus vaccine and Indian resistance to the HPV vaccine. In these cases, a sense of outrage follows not being treated with appropriate dignity (Larson, 2020, pp. 23–26). On the Kenyan case she says: “The vaccine itself was not the real issue. It was about self-determination, dignity and distrust” (p.23). And on resistance to the HPV vaccine in India: “Among their list of grievances, one focussed not on the vaccine, but on the way they felt treated by the health authorities. It was about broken trust” (Larson, 2020, p. 25).

Didier Fassin, in his book on HIV/AIDS in South Africa, *When Bodies Remember* (Fassin, 2007), even uses similar language to Strawson, describing the viscerally negative response to HIV/AIDS interventions as being partially driven by an “economy of resentment” (Fassin, 2007, p. 170–171),⁶ by which he means the continued negative emotional response to a past of mistreatment by government and their policies.

While it is neat that the sociological literature on negative affective responses to value contraventions lines up so well with the philosophical Strawsonian literature on negative reactive attitudes, there is something troubling about these accounts, which is that they require that people have the expectation that normative commitments will be met. However, we know from Amartya Sen's work on adaptive preferences, that those who have a history of receiving maltreatment may come to adjust their expectations. Sen describes this phenomenon as follows:

The underdog learns to bear the burden so well that he or she overlooks the burden itself. Discontent is replaced by acceptance, hopeless rebellion by conformist quiet, and – most relevantly in the present context – suffering and anger by cheerful endurance. As people learn to adjust to the existing horrors by the sheer necessity of uneventful survival, the horrors look less terrible in the metric of utilities. (Sen, 1984, p. 309)

Later on the same page: “[Q]uiet acceptance of deprivation and bad fate affects the scale of dissatisfaction generated” (Sen, 1984, p. 309). Sen's work on adaptive preferences indicates two things relevant to us here: 1) people who have long lived in conditions of deprivation may become habituated into those conditions, and as such they might lack appropriate normative expectations; 2) relatedly, individuals might lack appropriate affective reactions to what are actual value contraventions because they have become so used to poor treatment. So, while we might often see negative emotional responses to value contraventions, Sen's work teaches us that the worst-treated might not display this reaction.

5.2. *Emotions as evaluative*

In section 5.1 it was noted that value contraventions can and do trigger emotional responses, which can in turn fuel resistance to science-based health interventions – whether rightly or wrongly. But the temporality need not operate just in that one direction – that is, it need not be that a value transgression is followed by an emotional response. Rather, emotions can provide us with information that a value contravention has taken place. For instance, anger might be an indicator that an injustice has occurred (Carman, 2022, p. 49). So, one can feel anger without quite recognizing at that point what is going on. It is only on further investigation that it becomes clear that the anger was a response to a value contravention. Carman is clear that emotions are not perfect signals. It may turn out there was nothing underlying the emotion, and that in that case the emotion was inappropriate, but the feeling gives us an indication that there might be something worth investigating. Anderson similarly notes that emotions are “capable” of doing evaluative work (Anderson, 2004, p. 11).

The point about emotions being a signal for value contravention is distinct from another point that is often made in the literature on the relationship between values and emotion, which is that emotions can be indicative of what really matters to you. Arpaly, for example, makes this point in her example of Emily the PhD student. Emily is an excellent PhD student and all of her reasons suggest that she should continue in her PhD program. But, when she thinks about her PhD, it makes her feel sad and restless. Her emotions are indicative of what she actually values (Arpaly, 2000, p. 504). This is reminiscent of Jane Eyre’s refusal of her cousin’s proposal that they marry and become religious missionaries together in India, as described in the classic Victorian novel by Charlotte Brontë. Jane thinks that this would be a virtuous thing for her to do, but when she considers actually going through with it, she experiences extreme negative affect. She describes the experience as being one in which an “iron shroud” constricts around her and that her heart is “mute” (Brontë, 1897, p. 241–243). Again, here, we see emotion as indicative of what the agent actually values, and this helps her make the right decision.

Affect as an indication of either value contravention, or as an indication of what an agent actually values, will be subject to the same adaptive preference problem identified in Section 5.2. That is, some may have been treated so badly that they don’t have the affective experiences that can be evaluative in these helpful ways.

This is the final interactive effect in our mapping. This portion of our picture may not be especially helpful with cases of distrust in science. It does, however, make our account more comprehensive and allows us to have a more complete picture of what is going on when people resist health policies or medical interventions.

6. Upshots of the interactive approach to distrust

Sections 3, 4 and 5 have provided a pairwise mapping of the interactive effects of “beliefs”, “values” and “emotions” to better understand distrust in medical and healthcare interventions. The pairwise mapping is merely to keep the project manageable within the length of a paper, but the reality of all this is likely much messier. What, then, is the upshot of all of this for practice?

The upshot is that effective health policy and medical intervention is very difficult to get right, which will be an unsurprising result for practitioners. In Cartwright and Hardie’s *Evidence-Based Policy* (Cartwright & Hardie, 2012) guidebook, they argue that policy interventions should be seen as one contributory cause in a causal bundle (or an INUS condition – an insufficient but necessary part of a condition which is itself unnecessary but sufficient for achieving the result) (Cartwright &

Hardie, 2012, p. 63)). One way to think about this is that the policy is like the flour in a cake recipe – you need the flour to make the cake, but you also need the other ingredients in the right configurations to get the result of a cake. Similarly, while reduced class sizes (a policy intervention that they discuss in the book) will be one contributing factor to improved educational outcomes in school children, you also need to make sure that teachers are appropriately qualified and that there are good classroom spaces in which children can learn. The lesson from Cartwright and Hardie is that policy makers need to pay attention to more than just the isolated intervention if they are going to succeed in their aims. They need to pay attention to the whole bundle of contributory causes.

The upshot of the account provided in this paper is that there might be even further, potentially less tangible INUS conditions to consider when delivering health-orientated interventions. For instance, how to people already feel about health interventions delivered by outsiders?

7. Concluding thoughts

The aim of this paper is to complement the existing philosophical literature on public distrust in science. This literature has expanded from strictly epistemic accounts of trust and distrust (John, 2011; Longino, 1990; Oreskes & Macedo, 2019), to include values (Goldenberg, 2021; Kitcher, 2011) and emotions (Furman, 2020). This paper has tracked the ways that beliefs, values and emotions interact, and the implications of these interactions for understanding distrust. The implication of this account is that interventions in cases of distrust are going to be even more difficult than one might anticipate. At the very least, they are going to have to go well beyond public health information campaigns.

Notes

1. This will also be true for other sciences that are deeply involved with and disruptive of people's everyday lives. David Ludwig 2023, for instance, convincingly argues that agricultural science deeply impacts people's everyday lives and stands in the same fraught relationship with society as the medical cases I discuss here. Agricultural science, like medical science, is simultaneously enormously socially beneficial and can be socially destructive. This leads to similar social complexities as those outlined in this paper.
2. Gabriel Abend (2008) is clear that there is much ambiguity and disagreement in social research about what is meant by "theory". This is too large a topic to tackle here and would distract from the main concern of this paper. It is enough, for our purposes, that a theory has more to say about a phenomenon than a concept, even though having good concepts is helpful for developing good theories.
3. Thanks to Lisa Herzog for making this clear to me.

4. It should be noted that this is usually described as the relationship between “facts” and values in this literature. There is no perfect language, but I prefer “belief” and “information” over “fact” here, because “fact” suggests an unchangeable quality of the products of science that is rarely supported by history.
5. Fairhead describes this as a transgression of “social accommodations”.
6. It should be noted that Fassin is explicit that he is taking the use of the term “resentment” from Nietzsche – “[it] typifies the painful relationship that dominated people have to their history” – so it is not directly a reference to Strawson.

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