

For any issues with this document, please contact your library.

Title: The Routledge Handbook of Epistemic Injustice
Author: Ian James Kidd
ArticleTitle: Epistemic Injustice in science
ArticleAuthor: Grasswick, Heidi
Description: xviii, 419 pages
Pages: 313-323
ISBN - 9780367370633;
Publisher: New York ; London : Routledge 2017
Source: The Routledge Handbook of Epistemic Injustice
Copyright: CCL

NOTICE CONCERNING COPYRIGHT RESTRICTIONS:

The copyright law of the United States [[Title 17, United StatesCode](#)] governs the making of photocopies or other reproductions of copyrighted materials.

Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specific conditions is that the photocopy is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of "fair use," that user may be liable for copyright infringement.

This institution reserves the right to refuse to accept a copying order if, in its judgment, fulfillment of that order would involve violation of copyright law.

EPISTEMIC INJUSTICE IN SCIENCE

Heidi Grasswick

Science and epistemic injustice

Scientific practices offer powerful forms of knowing, and there is no question that in the twenty-first century, they are a dominant force in knowledge production and circulation. Scientific practices are powerful both in the sense of producing immense amounts of knowledge that can be harnessed for use, and in the more basic sense of shaping contemporary life and material conditions of existence through resultant technologies, science-based policies, and science-based decision-making. Though the specifics of how the practices of science shape life vary tremendously around the globe and across social positions, it would be difficult to make the case that anyone remains untouched by their influence. Given their epistemic strength and political influence, scientific institutions and their practices need to be investigated as possible sites and sources of epistemic injustice.

That racism and sexism, among other forms of oppression, have significantly shaped the practices and results of science is by now well documented by postcolonial science and technology studies scholars, feminist theorists and philosophers of science, and critical race theorists alike. Historically, formal and informal barriers to the participation of women and racial minorities in scientific enterprises have had the effect of disproportionately favoring white males' presence and influence in science (Gornick 1990; Harding 1991, 1993; Schiebinger 1989, 1999). Internal to scientific communities, cultural climates hostile to women and racial minorities have been identified as key factors in making the progression of careers more difficult for members of these groups (Angier 1991; Fehr 2011; Harding 1993; Valian 1998).

Additionally, the ways in which scientific research on humans has been done and how research subjects have been treated have been influenced by racist attitudes and practices. Although protocols and regulations concerning the ethical treatment of human subjects in experimentation have evolved over time, some of the most egregious historical examples of the ethical abuse of research subjects have involved racial minorities or the poor. One of the most famous cases is the Tuskegee syphilis experiment from 1932–1972 in which the progression of the disease was studied in African-American men. Long after penicillin was discovered and became the standard treatment for syphilis, the Tuskegee study continued, with the men being denied treatment for their disease (Reverby 2009). Research directions themselves have also at times been motivated by racism and sexism. Long periods of scientific racism have been identified in which scientific research has

been undertaken in order to justify whites' 'superior' place in the social and natural order (Gould 1996; Harding 1993). Research programs on behavioral links with biological sex differences have at times been developed and used to justify scientifically the underrepresentation of women in top positions in business, politics, and science (Fausto-Sterling 1992; Jordan-Young 2010).

Though many racist and sexist-motivated research projects have been discredited and strongly criticized for their use of poor methodologies, their place in the history of science makes it far from clear that scientific practices can be accurately characterized as generally aiming to benefit all of humanity. Historically, some groups have driven and benefitted from scientific research to a greater degree than others. As Shannon Sullivan and Nancy Tuana point out in the introduction to their collection, *Race and Epistemologies of Ignorance*, "a lack of knowledge or an unlearning of something previously known often is actively produced for the purposes of domination and exploitation" (Sullivan and Tuana 2007: 1).

More subtly, beyond the motivations and social applications of scientific research, background assumptions about social groups have shaped the generation of scientific knowledge. Because science is a human practice that takes place in a social context (Rouse 1996), it is not surprising that background assumptions about the social order are reinscribed within specific scientific practices as scientists generate scientific hypotheses, employ scientific reasoning, and eventually produce scientific results. Feminist science studies scholars have pointed to numerous examples where androcentric assumptions have shaped research design, such as the case of heart disease research. For years heart disease was studied on male subjects only, working with the assumption that male bodies were the norm and that the disease would present similarly across the sexes. This led to the specific manifestation of heart disease in women being underfunded and understudied (Rosser 1994). Gendered and racialized assumptions also play a role in the analogies, metaphors, and even structures of reasoning that are used to understand scientific processes. For example, gendered stereotypes associating masculinity with activity and femininity with passivity led to a dominant yet inaccurate understanding of the comparative role of egg and sperm in human reproduction, casting the sperm as active and the egg as purely a passive receptacle (Martin 1996).

Many of these intersections of scientific practices and the forces of oppression exemplify clear ethical injustices. It is an ethical injustice to discriminate against women and racial minorities in the entry to and participation in science; it is an ethical injustice to mistreat research subjects and exercise lower standards of care for particular groups; it is an ethical injustice to ignore the needs of certain segments of the population in scientific research, directing it instead toward the interests of the dominant. Strikingly, in spite of such historical patterns of ethical injustices in science, philosophy of science itself has paid comparatively little attention to questions of the ethics of science when measured against the wealth of philosophical material generated on the metaphysics, epistemology, and logic of science. While such ethical issues are important to attend to for their own sake, they also have more epistemic significance than traditional philosophers of science have supposed.

Many of these noted intersections of science and ethical injustice either constitute or contribute to cases of *epistemic* injustice. Epistemic injustices are those injustices where a wrong is "done to someone specifically in their capacity as a knower" (Fricker 2007: 1). 'Knowers' needs to be understood in a broad sense here, encompassing those who seek to know and understand the world around them, not just those who already know or claim to know. Epistemic injustice, then, includes unjust impediments to one's capacity as an *inquirer* (Anderson 2015). It involves obstacles to activities that are "distinctly epistemic" (Hookway 2010: 155). Appreciating the distinctively epistemic nature of such injustices is necessary if we are to have a thorough understanding of the social nature of our epistemic pursuits and correspondingly, the social conditions required in order to flourish epistemically.

Injustices deal in social relations and interactions. *Epistemic* injustices exist because large portions of our epistemic lives are social. Scientific inquiry in the twenty-first century is one of the most socially complex forms of knowing, due to its intense cognitive division of labor; this social complexity means that biases and stereotypes can influence epistemic interactions, just as they can any form of social interaction. Moreover, because scientific knowledge production is tightly intertwined with social needs and goals for its development and application, social injustices can push science in certain directions such that it creates new forms of understanding that can then serve as sources of further injustices. For example, research might be undertaken to legitimate certain gender or racial biases that in turn come to be relied upon both in the generation of further knowledge and in interactions with other knowers. Both science's internal nature and its connections to the rest of society make it particularly vulnerable to epistemic injustices.

The first wave of extensive discussions of epistemic injustice focused on and further developed the two forms of epistemic injustice – testimonial and hermeneutical – that were introduced and analyzed in Miranda Fricker's (2007) landmark, *Epistemic Injustice*. *Testimonial injustices* concern credibility deficits that members of subordinated groups experience due to social prejudice. In the case of scientific practices, evidence of testimonial injustices can be found in the documented experiences of racial minorities and women within science who have had to confront a model of the ideal scientist as a white male in a white lab coat, and have had to struggle to have their claims heard and taken seriously in the classroom and the lab (Keller 2002; Sands 1993; Weisstein 2002). Or consider cases where medical researchers and physicians perceive female patients and research subjects as being overly emotional and unreliable observers of their embodied experiences, given cultural stereotypes regarding femininity, perceptions that lead to either a dismissal of their symptoms or an increased likelihood of interpreting their medical complaints as having a psychological dimensions (Carel and Kidd 2017; Sherwin 1992; Wallen, Waitzkin and Stoeckle 1979).

Hermeneutical injustices concern the inability of subordinated groups to adequately understand their experiences due to the poverty of conceptual resources available for such understanding. When scientific research programs are directed toward the needs of the privileged, as historically they have been, structural gaps in conceptual and empirical resources evolve resulting in hermeneutical injustices that disadvantage subordinated groups in their ability to come to understand their experiences and convey that understanding to others.

Both testimonial and hermeneutical injustices play significant roles in scientific practices. However, in what follows, I frame my discussion in terms of two broad forms of epistemic injustice that scientific practices are especially prone to given the history of science's evolution within a social context of racial and gender oppression: *participatory* and *epistemic trust injustices*. These injustices track two broad categories of epistemic encounters: engagement as participants in knowledge generation and as receivers of knowledge. I focus primarily on racial and gender oppression, but epistemic injustices threaten to emerge wherever there is oppression, and scientific practices can be examined for evidence of epistemic injustice along any axis of oppression and at the intersections of multiple axes of oppression.

Participatory epistemic injustices in science

Testimonial injustices are crucial to understanding the unjust impediments to the central epistemic activities related to knowledge transmission, yet epistemic injustices can also afflict many other core epistemic activities concerning the generation of knowledge itself. Christopher Hookway makes this point when he emphasizes the central importance of cooperative epistemic endeavors and argues that there is a wide variety of types of participant contributions that lead to the success of cooperative epistemic pursuits, contributions well beyond offering or seeking testimony

(Hookway 2010). Discussion and deliberation about epistemic matters, such as asking relevant questions or offering counterexamples to a proposal, are crucial to forwarding cooperative epistemic inquiry (Hookway 2010: 160). Taking such activities as central to cooperative epistemic pursuits, Hookway argues that if someone fails to be taken seriously in their contributions to joint epistemic inquiry due to the forces of oppression (such as through the mechanisms of prejudices and stereotypes), an epistemic injustice occurs. He offers the example of a teacher who, although willing to take student's informational questions seriously in their role as student, does not give a student uptake when they ask a question that is intended as a contribution to the inquiry itself. What happens in such cases is that someone who wishes "to be recognized as a member of a community of people collaborating in the attempt to improve understanding or advance knowledge" fails to be so recognized (Hookway 2010: 155). Their capacity to contribute to cooperative inquiry as an epistemic agent is stymied. When this happens as a result of systematic forces of oppression, a *participatory epistemic injustice* results.¹ Testimonial injustices are key examples of this broader category of epistemic injustice; suffering a credibility deficit due to social prejudice when making a relevant knowledge claim within the context of a joint inquiry is one obvious way to have one's participation in a joint epistemic endeavor stymied. But the category of participatory injustice is set out to include additional cooperative epistemic activities such as querying the assumptions, methods, and results at stake, being taken seriously in a brainstorming session, or being sought out by others to critique a novel theory or idea in its early form. None of these activities fit under a narrower model of testimonial injustice where the focus is on credibility assigned when one is making an assertion of knowledge. Hookway also notes that there can be far-reaching consequences from participatory injustices, as they can affect additional epistemic capacities of the recipient. When one is not taken seriously as a participant in inquiry, one can lose epistemic confidence or self-trust, becoming too tentative in one's contributions (Hookway 2010: 159). When one's questions are ignored, one may develop a habit of silencing oneself, not asking relevant questions that might forward the investigation (Hookway 2010: 156).²

As is well recognized by many philosophers of science, scientific practices are paradigms of cooperative inquiry. Thomas Kuhn famously emphasized the shared theoretical structures and methodological orientations that make collaboration and progress in periods of 'normal science' possible (Kuhn 1970). Karl Popper articulated the role of criticism in the collective endeavor of science (Popper 1962). Michael Polyani drew attention to the 'tacit' dimension of science with its shared sets of practices (Polyani 1958). Particularly in a contemporary context where scientific work is highly specialized, research progress depends upon a strong cognitive division of labor (Kitcher 1990). Scientists rely on the research activities and testimony of other scientists whose specialties differ from their own (Hardwig 1991). Even within small lab teams that may not require different specialists testifying on different topics, discussion and deliberation amongst team members is crucial to the development of theories, techniques, and ultimately, results and their interpretation.

Classic work in the sociology of science has detailed many of the ways in which social interactions amongst scientists and especially patterned dynamics within and across groups of scientists affect scientific outcomes and important decisions regarding the status of results (Galison 1987; Keller 1985; Latour and Woolgar 1986; Pickering 1984). The centrality of such social elements to the core activities of science make participatory epistemic injustices highly relevant to understanding scientific practices and the ways in which oppression can be implicated in them. Participatory epistemic injustices capture both obvious and not so obvious ways in which one's capacity to contribute to scientific knowledge-making can be stifled by the effects of oppression.

The denial of equal educational opportunities of the kind required for participation in scientific communities offers a clear example of a participatory epistemic injustice (see Kotzee 2017).

This extends not only to specific training for careers in science, but also to skills acquired through quality education that serve as markers for credibility, such as standardized grammar. As Elizabeth Anderson notes, “in societies that systematically deprive disadvantaged social groups of access to a decent education, the use of such markers in assessing credibility will tend to exclude those groups from further participation in inquiry” (Anderson 2012: 169). In the case of science, the significance of such participatory epistemic injustices is exacerbated because of the high degree of cognitive authority placed in the institutions of science. When society as a whole relies on and privileges the institutions of science to direct and produce knowledge that will have social relevance, the impact of participatory epistemic injustices that prevent or deter access to these communities of knowledge generation is more pronounced than in other areas of knowledge production.

Participatory injustices are of course also experienced by members of subjugated groups who are a part of a formal scientific community – for example, a credentialed scientist or graduate student acting as a member of a research team, a member of a different research team working in a similar area, or a peer reviewer of others’ work. In any of these situations, the scientist’s potential to contribute to and influence the research process depends on how they and their contributions to dialogue and deliberation are received by other scientists. Members of underrepresented groups who have managed to ‘make it’ into the formal scientific community are not necessarily always treated with the same respect and granted the same level of cognitive authority as other similarly talented members of the community. When members of underrepresented groups are taken less seriously and given less uptake in their intellectual interactions with their peers because of such biases, they suffer participatory epistemic injustices. Implicit biases of other researchers concerning race and gender in relation to ‘smartness’ and scientific creativity can affect how a wide variety of types of contributions of members of underrepresented groups are perceived, with cascading epistemic effects. Participatory injustices can occur when, due to such implicit biases, members of certain groups are not invited or encouraged to submit work to important conferences or publication venues to the same extent as others, or when their names are simply not thought of when members of the profession are soliciting peer reviewers. Furthermore, when members of certain groups are taken less seriously in the classroom, in the lab, at conference venues, and in the grant proposal process, one effect can be that the researcher does not receive the level of rigorous criticism that might be required in order to strengthen their work or help them identify in what positive direction the work needs to be developed. This too is a participatory injustice.

It is these types of dynamics that Helen Longino seeks to identify as problematic when she articulates communal requirements for objectivity and explicitly includes conditions of equality of intellectual authority³ and community responsiveness to criticism (uptake) (Longino 2002). The goal of scientific objectivity as Longino understands it necessarily conflicts with participatory epistemic injustices. As she writes, “the social position or economic power of an individual or group in a community ought not determine who or what perspectives are taken seriously in that community” (Longino 2002: 131).

It is also possible to experience a participatory epistemic injustice with respect to science without formally being a member of any scientific community or striving to become one. Specifically situated laypersons can be in possession of local knowledge that is not directly accessible to professional scientists yet is highly relevant to a research project.⁴ Local knowledge comes in various forms. It could be additional data or observations that are gathered simply in the course of living in the particular environment of interest: scientists from southern Canada interested in wildlife management in Canada’s Arctic, whose field season often consists of only a few summer weeks, may have much to learn from observations of Inuit who live in the vicinity of the wildlife ranges

through all seasons (Nunavut Wildlife Management Board 2000). Similarly, interviews with Iñupiat elders on the western Arctic Coastal Plain of northern Alaska have proved scientifically valuable in filling in historical information on local landscape change (predating aerial photographs and satellite imagery) (Eisner et al. 2009). Yet it is only relatively recently that such input from indigenous groups has been solicited, and the lack of such solicitation due to biases regarding what such groups could offer to the research process constitutes a participatory injustice.

Local knowledge can also take the form of nuanced understandings of the environment of study and practical ‘know how’ that may be valuable for determining the most useful research techniques and interpreting the research results of a study. For example, amongst post-Chernobyl concerns of radio-active fall-out and the contamination of sheep in the United Kingdom, Cumbrian sheep farmers developed frustration with scientists, who were ignorant of the practical difficulties of gathering sheep from open fells for testing, and the nuances of successful hill-sheep farming – ignorance that led to poorly formed policy regulations with severe financial losses for the farmers (Wynne 1992). Local knowledge from those outside the scientific community is often required to understand fully a problem that science aims to address, as well as to craft a solution that will be viable within the local context (the details of which may only be understood by locals).

Referencing archaeology and sociology in particular, Alison Wylie has stressed the importance of collaborative research with marginalized communities, arguing that in many contexts, such communities have valuable theoretical, methodological, and empirical insights to offer, as well as the possibility of a critical perspective on the assumptions of the scientific work (Wylie 2014).⁵ Yet often, scientific communities do not seek such insights from the marginalized and commit participatory injustices in the process. It is all too easy for scientists’ biases concerning traits associated with a group to affect their willingness to engage with and find value in the potential contributions of specific lay communities. The unjust influence of such stereotypes often ends up being coupled with the effects of an assumption of epistemic privilege (in comparison with ‘untrained laypersons’) that many scientists already carry. This can result in a collection of participatory injustices: testimonial injustices that dismiss attempts of lay communities to contribute knowledge relevant to the research, failures to take seriously the questions that these communities may be asking about the research, and failures to solicit input from such communities.

Patient advocacy groups from the Women’s Health Movement (Tuana 2006) to AIDS advocacy groups (Epstein 1996) offer examples of resistance to such participatory injustices involving those outside of scientific communities. Such advocacy groups have fought for the inclusion of relevant lay communities in decisions about the direction of research and the choice of research methodology. They have argued for not just the correction of testimonial injustices, but also the correction of broader participatory injustices that have prevented such groups from contributing to the shape of research agendas and priorities when their understandings of the epistemic needs may differ from the perspective of the scientists. For example, as the race for AIDS treatments was unfolding, AIDS advocacy groups fought for a place at the scientific table, arguing that they understood the needs of AIDS patients better than many of the researchers and had a right to contribute to decisions about experimental treatments and the kinds of trials that were most likely to serve AIDS patients well (Epstein 1996; Hood 2003).

Epistemic trust injustices⁶

Unjust obstacles to one’s abilities to directly or indirectly contribute to scientific practices and the development of scientific knowledge do not exhaust the kinds of epistemic injustice that occur with respect to the sciences. All members of society, including scientists themselves, are

positioned as non-experts with respect to most (and for some of us, all) scientific fields. Epistemic injustices can be inflicted upon non-experts who do not participate directly in the relevant inquiry but instead rely on others as sources of knowledge and understanding. In a social world, core epistemic activities extend not only to participation in the generation of knowledge and our communication of that knowledge, but also to our actions and judgments as potential *receivers* of knowledge and understanding. Social conditions have to be right for one to be able to receive claims from scientists (or other inquirers) in an epistemically responsible way. While many characteristics of social institutions (from poor science education, to interest groups propagating poor quality science, to poor media coverage of science) can interfere with one's capacity for epistemically responsible reception of scientific knowledge, conditions of oppression are significant in their potential to unjustly impede this ability, placing a greater epistemic burden on the marginalized.

For laypersons, the route to acquiring some degree of knowledge and understanding in an area in which they lack expertise lies in *trusting* the appropriate experts. To not trust scientists is to do without the knowledge they might be able to convey and suffer an epistemic opportunity loss in the process (Kitcher 2011). Laypersons need to trust scientific communities in order to benefit from the very best and most relevant scientific results along with the scientists' professional judgments of the status of scientific research, including its uncertainties. With this necessary epistemic role of trust comes the possibility of what I call *epistemic trust injustices*. Epistemic trust injustices occur when, due to the forces of oppression, the conditions required to ground one's trust in experts cannot be met for members of particular subordinated groups.⁷

The need for trust makes each of us vulnerable to others who claim expertise. It would be epistemically unwise to offer blanket trust to anyone and anything purporting to be scientific or that one takes to be scientific. One can be too gullible and lack discernment in one's placement of trust. For ideal epistemic success, the degree of trust one grants would always be balanced by the trustworthiness of the source. Problematically, however, one is never in a position to fully determine the trustworthiness of one's source. But it remains possible to distinguish *responsibly-placed trust* – trust granted in cases in which one has a preponderance of evidence for the trustworthiness of the source – from irresponsibly-placed trust in which the preponderance of evidence should lead one instead toward an attitude of distrust (Grasswick 2014).

Responsibly-placed trust is what is required in order for an agent to be able to receive knowledge and understanding from others in an epistemically virtuous way. Yet an epistemic community's trustworthiness, as well as the evidence available supporting that trustworthiness may vary, depending on the situation of the potential truster and their relationship with the knowledge provider. Trustworthiness is *situated*. In the case of a subjugated group that has experienced a history of oppression, a preponderance of evidence against the epistemic trustworthiness of scientific communities (leading to responsibly-placed distrust rather than responsible trust) can result when those scientific communities have participated in and contributed to that very history of oppression. In such circumstances, an epistemic trust injustice occurs, wherein members of the group are unable to satisfy the conditions of responsible trust.

One kind of evidence that speaks against the trustworthiness of a scientific community for a particular group is a history of scientists having gotten things wrong, especially with respect to areas of knowledge that are of particular relevance for the group. For example, female sexuality is of obvious interest to women, yet feminists have demonstrated how sexist biases and background assumptions have played a significant role in the history of research on women's sexuality, resulting in mistaken understandings and areas of ignorance that can be damaging to women (Lloyd 1993; Tuana 2006). Similarly, projects of scientific racism have purported to explain away economic disparities between those of European descent and those of African

descent, suggesting no changes in social policy need to be made, yet repeatedly these projects have come to be discredited (Gould 1996; Harding 1993). Such evidence proves that scientists have repeatedly produced theories and results that turn out to be mistaken, a pattern that occurs more frequently with respect to particularly relevant knowledge for a specific group, offers reasons for the group's distrust.⁸

But other kinds of evidence can also contribute to an attitude of responsible distrust in scientific communities and their results. Naomi Scheman has explicitly argued for the link between histories of oppression and the epistemic untrustworthiness of scientific communities and institutions without focusing on instances of 'bad science' that gets things wrong. Instead, Scheman emphasizes the "systematically trust-eroding effects of various forms of social, political, and economic injustice" (Scheman 2001: 34), all of which can be identified in the institutions and practices of science. Histories of one's group having suffered ethical abuses as research subjects, being discriminated against in the entry to and participation in the institutions of science, and having had one's epistemic interests ignored while scientific institutions have appeared to serve the interests of the dominant, all contribute to the untrustworthiness of scientific institutions for members of such groups. Scheman writes, "the credibility of science suffers, and, importantly, *ought* to suffer . . . when its claims to trustworthiness are grounded in the workings of institutions that are demonstrably unjust – even when those injustices cannot be shown to be responsible for particular lapses in evidence gathering or reasoning" (Scheman 2001: 36). Her point is not that such ethical injustices imply that scientific institutions cannot serve as reliable truth trackers, but rather that what matters for grounding trust is whether or not variously situated laypersons outside of science can justifiably think they can serve as such (Scheman 2001: 35). Being at the receiving end of ethical injustices that are deeply connected to how these institutions and communities produce knowledge undermines reasons for trust in their knowledge claims.

This is a somewhat controversial connection to draw. However, it rests on a recognition that trust is a social relation, with an attitudinal dimension. Well-placed epistemic trust depends on the sincerity of the testifier toward a potential truster in a particular context, and a shared understanding of the goals of the particular epistemic enterprise that drive some of the decisions throughout inquiry (Willholt 2013). Evidence of historical mistreatment by a scientific institution, especially if coupled with a lack of evidence that the institution's practices have changed significantly, does not foster confidence that the institution will be able to provide honest and meaningful knowledge for a member of a group that has suffered such mistreatment.

Though her work is not framed in terms of epistemic injustice, Scheman's arguments support the claim that members of subordinated groups can suffer epistemic trust injustices with respect to science. This is not a blanket claim that applies to all subordinated groups with respect to all scientific communities and institutions. Rather, the occurrence of epistemic trust injustices depends on the specific history of relations between scientific institutions and subordinated groups. Anthropology, for example, is a field whose origins were premised on the subordination of certain peoples and has a troubled history with many of these groups (Tsosie 2017). Where there is a poor track record of a particular scientific institution's interactions with a subordinated group, often alongside a poor record of the institution's ability and commitment to produce high quality knowledge that matters for the group, the conditions required to ground trust in the institution for epistemic matters cannot be met, and the group's epistemic abilities to gain knowledge and understanding through trust in scientific institutions are compromised.

Additionally, there are participatory repercussions of epistemic trust injustices. If certain groups do not trust an area of scientific research, they are unlikely to want to participate in it. For example, in the attempt to diversify the pool of research subjects in medical research and correct some of the racist and androcentric assumptions of the past, it has at times been challenging for

researchers to encourage increased participation amongst certain demographics due to historical distrust (Epstein 2007).

The significance of epistemic injustice in science

If science were just one among many equally influential ways of knowing in society, the epistemic injustices perpetrated through them would be far less serious. This is because there would be other ways in which to exercise one's epistemic agency (and have that agency recognized by others); so, although the epistemic injustices perpetrated through science would still interfere with one's capacities as a knower, whether that be through direct participation in it or through one's trust in it, the significance of these interferences to one's overall capacities as a knower would be less. However, the sheer dominance of scientific ways of knowing, and the cultural and cognitive authority that they carry, have worrisome effects (Feyerabend 1975, 1978).⁹ Among them, the epistemic injustices experienced through science and its dominance result in serious losses in epistemic agency for those who are subjected to them. This applies both to those who struggle against structural barriers and implicit biases within scientific communities to participate fully in the practices, as well as those who are in positions of simply trying to acquire knowledge through trust in those institutions that have produced scientific knowledge.

Addressing epistemic injustices in science is no small task. Because these injustices deal with institutions – institutions that are intermeshed with and interact with a host of other cultural and social institutions including government agencies, educational institutions, corporations, and media outlets – structural remedies are required (Anderson 2012). More challenging still, the mechanisms of multiple institutions are not infrequently put to use by those who seek to actively generate distrust in science for their own purposes, such as through viciously generating doubt in climate change (Oreskes and Conway 2010). In the case of participatory injustices in science, the mechanisms of implicit biases and stereotypes held by members of scientific communities play a major role, yet both the source of those mechanisms and their remedies lie outside the individuals involved; they are situated, within a long history of scientific practices evolving within a culture of oppression. In the case of epistemic trust injustices, remedies will only come when scientific institutions find ways of becoming more accountable to those positioned outside of science, and begin the very difficult work of building better trust relations with those who arrive at the window of science with both histories of distrust and reasons for that distrust. The analysis of epistemic injustices in science provided here is a necessary first step in being able to envision scientific practices that help foster people's epistemic agency, both inside and out of formal scientific institutions.

Related chapters 6, 11, 20, 21, 26, 31, 32, 34, 35

Notes

- 1 Hookway does not explicitly name these as participatory epistemic injustices. He instead refers to epistemic injustices that can “only be detected from the participant perspective” (Hookway 2010). Kwong (commenting on Hookway) uses the phrase ‘participant-based injustices’ (Kwong 2015: 339).
- 2 Kristie Dotson makes a similar point concerning testimonial injustices, arguing that when testimonial injustices occur, a coerced self-silencing can follow that she calls ‘testimonial smothering.’ In testimonial smothering, the victim comes to testify only with respect to things that they think will be understood and taken seriously (Dotson 2011).
- 3 In her 2002 book, Longino notes this must be understood as a ‘tempered’ equality of intellectual authority, in order to allow for differences in native ability and schooling.
- 4 Harding has argued that rather than only considering modern western scientific practices as ‘science’, we need to consider classifying a multiplicity of culturally specific yet reliable ways of knowing (traditional knowledges or local knowledges) as ‘sciences’ (Harding 2008).

- 5 This is not to say there are not challenges and limitations to the extent to which scientists are able to incorporate assumptions of lay communities that may severely challenge the basic premises of a scientific approach to their work and their commitments to certain standards of evidence. For a discussion of such limitations that face archeologists, see Cooper (2006).
- 6 Material in this section is based upon work supported by the National Science Foundation under Grant No. 1230600.
- 7 The concept of ‘epistemic trust injustices’ that I am using should not be confused with the idea of ‘trust injustices’ put forth by Gerald Marsh (Marsh 2011). Marsh’s trust injustices are ethical injustices that occur when one fails to trust another for prejudicial reasons.
- 8 Even beyond concerns of specific groups, arguments in contemporary philosophy of science have suggested that our current scientific theories may not be the best, given the problem of as yet unconceived alternative theories that would likely be adopted over our current theories if they were to be so conceived (Stanford 2006).
- 9 For a sympathetic and insightful reading of the development of Feyerabend’s thoughts on the relationship between science and society, see Kidd (2015).

References

- Anderson, E. (2012) ‘Epistemic justice as a virtue of social institutions,’ *Social Epistemology*, 26: 163–173.
- Anderson, E. (2015) ‘Feminist Epistemology and Philosophy of Science,’ *The Stanford Encyclopedia of Philosophy* (Fall 2015 Edition), Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/fall2015/entries/feminism-epistemology/>>.
- Angier, N. (1991) ‘Women join the ranks of science but remain invisible at the top,’ *New York Times*, May 21.
- Carel, H. and I.J. Kidd (2017) ‘Epistemic Injustice in Medicine and Healthcare,’ in I.J. Kidd, J. Medina, and G. Pohlhaus, Jr. (eds.) *Routledge Handbook of Epistemic Injustice*, New York: Routledge.
- Cooper, D.E. (2006) ‘Truthfulness and “Inclusion” in Archaeology,’ in C. Scarre and G. Scarre (eds.) *The Ethics of Archaeology*, Cambridge: Cambridge University Press, 131–145.
- Dotson, Kristie (2011) ‘Tracking epistemic violence, tracking practices of silencing,’ *Hypatia*, 26: 236–257.
- Eisner, W.R., C.J. Cuomo, K.M. Hinkel, B.M. Jones, and R.H. Brower, Sr. (2009) ‘Advancing landscape change research through the incorporation of Inupiaq knowledge,’ *Arctic* 62: 429–442.
- Epstein, S. (1996) *Impure Science: AIDS, Activism, and the Politics of Knowledge*, Berkeley: University of California Press.
- Epstein, S. (2007) *Inclusion: The Politics of Difference in Medical Research*, Chicago: University of Chicago Press.
- Fausto-Sterling, A. (1992) *Myths of Gender: Biological Theories about Women and Men*, (2nd Ed.), New York, NY: Basic Books.
- Fehr, C. (2011) ‘What’s in It for Me? The Benefits of Diversity in Scientific Communities,’ in H.E. Grasswick (ed.) *Feminist Epistemology and Philosophy of Science: Power in Knowledge*, Dordrecht: Springer, 133–155.
- Feyerabend, P. (1975) *Against Method*, London: Verso.
- Feyerabend, P. (1978) *Science in a Free Society*, London: New Left Books.
- Fricker, M. (2007) *Epistemic Injustice: Power and the Ethics of Knowing*, Oxford: Oxford University Press.
- Galison, P. (1987) *How Experiments End*, Chicago: University of Chicago Press.
- Gornick, V. (1990) *Women in Science*, New York: Simon & Schuster.
- Gould, S.J. (1996) *The Mismeasure of Man*, New York, NY: W.W. Norton and Company Inc.
- Grasswick, H. (2014) ‘Climate change science and responsible trust: A situated approach,’ *Hypatia*, 29: 541–557.
- Harding, S. (1991) *Whose Science? Whose Knowledge?*, Ithaca, NY: Cornell University Press.
- Harding, S. (1993) *The ‘Racial’ Economy of Science: Toward a Democratic Future*, Bloomington: Indiana University Press.
- Harding, S. (2008) *Sciences from Below: Feminisms, Postcolonialities, and Modernities*, Durham, NC: Duke University Press.
- Hardwig, J. (1991) ‘The role of trust in knowledge,’ *The Journal of Philosophy*, 88: 693–708.
- Hood, Robert (2003) ‘AIDS, Crisis, and Activist Science,’ in R. Figueroa and S. Harding (eds.), *Science and Other Cultures*, New York, NY: Routledge, 15–25.
- Hookway, C. (2010) ‘Some varieties of epistemic injustice: Reflections on Fricker,’ *Episteme*, 7: 151–163.
- Jordan-Young, R. (2010) *Brain Storm: The Flaws in the Science of Sex Differences*, Cambridge, MA: Harvard University Press.

- Keller, E.F. (1985) *Reflections on Gender and Science*, New Haven: Yale University Press.
- Keller, E.F. (2002) 'The Anomaly of a Woman in Science,' in J.A. Kourany (ed.), *The Gender of Science*, Upper Saddle River, NJ: Pearson Education Inc., 66–74.
- Kidd, I.J. (2015) 'Feyerabend on politics, education, and scientific culture,' *Studies in History and Philosophy of Science*, 57: 121–128.
- Kitcher, P. (1990) 'The division of cognitive labor,' *The Journal of Philosophy*, 87: 5–22.
- Kitcher, P. (2011) *Science in a Democratic Society*, Amherst NY: Prometheus Books.
- Kotzee, B. (2017) 'Education and Epistemic Injustice,' in I.J. Kidd, J. Medina, and G. Pohlhaus, Jr. (eds.) *Routledge Handbook of Epistemic Injustice*, New York: Routledge.
- Kuhn, T.S. (1970) *The Structure of Scientific Revolutions*, (2nd Ed.), Chicago: University of Chicago Press.
- Kwong, J. (2015) 'Epistemic injustice and open-mindedness,' *Hypatia*, 30: 337–351.
- Latour, B. and S. Woolgar (1986) *Laboratory Life: The Construction of Scientific Facts*, Princeton, NJ: Princeton University Press.
- Lloyd, E. (1993) 'Pre-theoretical assumptions in evolutionary explanations of female sexuality,' *Philosophical Studies*, 69: 139–153.
- Longino, H.E. (2002) *The Fate of Knowledge*, Princeton: Princeton University Press.
- Marsh, M. (2011) 'Trust, testimony, and prejudice in the credibility economy,' *Hypatia*, 26: 280–293.
- Martin, E. (1996) 'The Egg and the Sperm: How Science Has Constructed a Romance Based on Stereotypical Male-Female Roles,' in E.F. Keller and H.E. Longino (eds.) *Feminism and Science*, Oxford: Oxford University Press, 103–117.
- Nunavut Wildlife Management Board (2000) *Final Report of the Bowhead Knowledge Study, Nunavut Canada*, Iqaluit: Nunavut Wildlife Management Board.
- Oreskes, N. and E. Conway (2010) *Merchants of Doubt*, New York: Bloomsbury.
- Pickering, A. (1984) *Constructing Quarks: A Sociological History of Particle Physics*, Chicago: University of Chicago Press.
- Polyani, M. (1958) *Personal Knowledge: Towards a Post-Critical Philosophy*, Chicago: University of Chicago Press.
- Popper, K. (1962) *Conjectures and Refutations: The Growth of Scientific Knowledge*, New York: Basic Books.
- Reverby, S.M. (2009) *Examining Tuskegee: The Infamous Syphilis Study and Its Legacy*, Chapel Hill: The University of North Carolina Press.
- Rosser, S. (1994) *Women's Health – Missing from U.S. Medicine*, Bloomington: Indiana University Press.
- Rouse, J. (1996) *Engaging Science: How to Understand Its Practices Philosophically*, Ithaca: Cornell University Press.
- Sands, A. (1993) 'Never Meant to Survive: A Black Woman's Journey,' in S. Harding (ed.) *The 'Racial' Economy of Science: Toward a Democratic Future*, Bloomington: Indiana University Press, 239–248.
- Scheman, N. (2001) 'Epistemology Resuscitated: Objectivity as Trustworthiness,' in N. Tuana and S. Morgen (eds.) *Engendering Rationalities*, Albany: State University of New York Press.
- Schiebinger, L. (1989) *The Mind Has No Sex*, Cambridge, MA: Harvard University Press.
- Schiebinger, L. (1999) *Has Feminism Changed Science?*, Cambridge, MA: Harvard University Press.
- Sherwin, S. (1992) *No Longer Patient: Feminist Ethics and Health Care*, Philadelphia: Temple University Press.
- Stanford, P.K. (2006) *Exceeding Our Grasp: Science, History, and the Problem of Unconceived Alternatives*, Oxford: Oxford University Press.
- Sullivan, S. and N. Tuana (eds.) (2007) *Race and Epistemologies of Ignorance*, Albany: State University of New York Press.
- Tsosie, R. (2017) 'Indigenous Peoples, Anthropology, and the Legacy of Epistemic Injustice,' in I.J. Kidd, J. Medina, and G. Pohlhaus, Jr. (eds.) *Routledge Handbook of Epistemic Injustice*, New York: Routledge.
- Tuana, N. (2006) 'The speculation of ignorance: The Women's Health Movement and epistemologies of ignorance,' *Hypatia*, 21: 1–19.
- Valian, V. (1998) *Why So Slow? Women's Advancement*, Massachusetts: Institute of Technology, MIT Press.
- Wallen, J., H. Waitzkin and J.D. Stoeckle (1979) 'Physician stereotypes about female health and illness: A study of patient's sex and the informative process during medical interviews,' *Women and Health*, 4: 135–146.
- Weinstein, N. (2002) 'How Can a Little Girl Like You Teach a Great Big Class of Men?,' in J.A. Kourany (ed.) *The Gender of Science*, Upper Saddle River, NJ: Pearson Education Inc., 60–65.
- Wilholt, T. (2013) 'Epistemic trust in science,' *British Journal of Philosophy of Science*, 64: 233–253.
- Wylie, A. (2014) 'Community-Based Collaborative Archaeology,' in N. Cartwright and E. Montuschi (eds.), *Philosophy of Social Science: A New Introduction*, Oxford: Oxford University Press, 68–84s.
- Wynne, B. (1992) 'Misunderstood misunderstanding: Social identities and public uptake of science,' *Public Understanding of Science*, 1: 281–304.