

A Positionality Tool to Support Ethical Research and Inclusion in the Participatory Sciences

Abstract

Scientific research is not value-neutral but builds upon the stated and unstated values of those leading the research, influencing the choice of topics to study, decisions about methods, judgements or inferences with data, and considerations of the consequences of errors. In some fields, researchers create a positionality statement to disclose bias as a way to manage or neutralize the influence of values. Positionality refers to the way in which an individual's worldview, and thus perceptions and research activities, is shaped by the frameworks, social identities, lived experiences, and socio-political context within which they live. Thinking about positionality is a valuable, yet missing, element for practitioners of participatory sciences. In this essay , we suggest that those leading participatory science projects explore their positionality, irrespective of whether or not they choose to disclose it, in order to manage values for several goals: research integrity, ethical data practices, and equity and inclusion. By reviewing and synthesizing literature, we created a tool to help leaders of participatory science projects think reflectively (for awareness of their identities and characteristics) and reflexively (from an external position for critical observation of themselves) to recognize their influence on project design and implementation. We view examining positionality as a precursor to anticipating and taking actions to minimize epistemic injustices and ultimately enhance the unique capacity of each project to advance equity, inclusion and scientific productivity.

Keywords: reflexivity, diversity, bias, values

Introduction

The participatory sciences include projects that vary in epistemological approaches (in terms of ideologies of how knowledge production is agreed upon) and disciplines, and range from bottom-up, community-driven activities to top-down, institution-driven activities. Community-driven approaches might involve credentialed scientists as collaborators on a local project. Institution-driven approaches, often referred to as citizen science, typically engage geographically dispersed participants across large areas as human sensors of their local environment. There are thousands of citizen science projects, many have led to numerous discoveries and contributed significantly to our understanding of various scientific phenomena (Kullenberg and Kasperowski 2016).

While scientists typically perceive the pursuit of knowledge via scientific research as objective and value-neutral, philosophers recognize that science is built upon the stated and unstated values of those leading the research (Douglas 2000, Elliot 2017; Rudner 1953). Even values unrelated to the production of knowledge (i.e., non-epistemic values) influence the choice of topics to study, decisions about methods, inferences with data, and considerations of the consequences of errors. For example, 18th century phrenologists tried to link mental traits to cranial morphology in order to biologically justify white supremacy and racialized hierarchies (Branson, 2017). In modern times, implicit

biases abound throughout scientific inquiry and application (Greenwald & Krieger, 2006). For example, racial bias in decisions to calibrate pulse oximeters to skin with low pigmentation rather than high pigmentation resulted in higher proportions of Black than white people with COVID being hospitalized too late (Sjoding et al. 2020). Another recent example of the link between unacknowledged values and scientific research is in gender bias in studies of avian vocalizations, where female ornithologists recognized the wide occurrence and complexities of female avian song that male ornithologists overlooked (Smiley et al. 2022). The influence of values on the process of science can have consequences for how scientists view and fulfill obligations for knowledge production that benefits society. Like science, participatory science is also not value-free; it is built upon the stated and unstated values of those leading the project.

Examination and disclosure of positionality is one way to surface and then manage unstated values in research. Positionality refers to the way in which an individual's worldview, and thus perceptions and research activities, is shaped by the frameworks and socio-political context within which they live (Secules et al. 2020). In this essay, we introduce a Positionality Tool for use by those in any leadership role within participatory science projects to manage values and bias. Ethical obligations to participants are complicated by power differentials between scientists and participants. If the positionality of those establishing, designing, and leading participatory science projects is situated in dominant culture, the project leaders may shape projects in ways that inadvertently focus engagement on those with similar dominant social identities and lived experiences. Exclusion of marginalized segments of society from engagement is more than a simple missed opportunity. It produces epistemic injustice by denying

epistemic authority and local knowledge and by restricting benefits from? diverse segments of society (Mahmoudi et al. 2022). By examining one's positionality, project leaders may be better prepared to recognize and manage the impacts of their unstated and under-examined values on the participatory science projects that they lead.

Scientists engaged in research *about* people, especially qualitative social scientists sometimes write positionality statements as a way to acknowledge how their values and lived experiences may have impacted research findings. When a social scientist analyzes data, they are the instrument of analysis in a similar way that laboratory equipment are instruments of analysis for natural and physical science. For example, test tubes and beakers have measurable amounts of potential error that an analytical chemist can quantify. Whereas confidence intervals provide transparency about potential error in an analysis from an analytical chemistry lab, positionality statements are a qualitative researcher's form of disclosing biases that result from the research instrument (i.e., the researcher themselves).

In this essay, we suggest that those in leadership roles engaged in research *with* people (i.e., the range of participatory sciences) should explore their positionality, irrespective of whether they disclose it, in order to minimize the possibility of bias. An earlier version of the Positionality Tool is one part of the Data Ethics Toolkit (Cooper et al. 2022) and the version here (Figure 1) is part of the IDEAL Handbook (not publicly released yet). We briefly review concepts related to positionality, and then discuss the origins of this Tool, its structure and components, cautions and challenges for its use,

and conclude with a vision of how the Tool can support research integrity, ethics, and equity and inclusion in the participatory sciences.

What is Positionality?

Explorations of positionality are ways to disclose one's self in the research and one's influence on it. Positionality refers to the way in which an individual's perceptions and research activities are shaped by the frameworks and socio-political context within which they live (Savin-Baden & Major 2013; Rowe 2014). Positionality is informed by feminist participatory research that stresses the role of gender, race, class, and culture in research (Minkler and Wallerstein 2011) and standpoint theory (Harding 1991, 2004) in which one uses the experiences of those affected by the research as the foundation for investigation, combining local knowledge and social and political circumstances with formal scientific practices. Positionality includes ontological assumptions (beliefs about reality and what is knowable), epistemological assumptions (beliefs about the nature of knowledge), and assumptions about human nature (the way humans interact with the environment; Sikes 2004; Marsh et al. 2017). Positionality includes both fixed and fluid attributes including political affiliation, religious faith, gender, sexuality, location, ethnicity, race, social class, status, and disabilities (Sikes 2004, Marsh et al. 2017). These factors influence much about research, including what is researched, how it is done, and how results are interpreted (Rowe 2014). Reflecting on and disclosing positionality can ultimately reduce bias, but doesn't eliminate them.

Early work on positionality was introduced by Merton (1972) as Outsider and Insider Doctrines of research, with each position have benefits and challenges. Many other recognized the greater complexity of research relationships to communities than a simple insider/outsider dichotomy (e.g., Kerstetter 2012). Positionality has evolved to focus greater attention on recognizing the role of power and privilege and their impact on the research process and outcomes (Muhammad et al. 2015). Though not explicitly designed as a positionality tool, Johari's Window can help researchers become more self-aware about multiple perspectives (Oliver and Duncan 2019). In this framework researchers consider what they know, what others they work with know, what both they and others know, and what neither know to identify blind spots in the research process (Luft and Ingham 1961).

Ultimately the concept of positionality has developed to be more nuanced than insider or outsider status, or any particular dimension of identity (St. Louise & Barton 2002). It is necessary for explorations of positionality to involve two sorts of thinking, reflection, like looking up close in a mirror, to understand oneself based characteristics such as one's social identities, lived experiences, epistemic beliefs, and assumptions and reflexivity, like stepping back and viewing ourselves from a distance, to become critically aware of oneself in relation to larger contexts. Through reflection and reflexivity, one can unpack and expose power dynamics present in the research process, blinders that prevent researchers from observing certain perspectives or phenomena, and worldviews that elevate or over exaggerate other perspectives or phenomena.

Developing a Positionality Tool for the Participatory Sciences

Two of the authors (first and last) created an initial version of the Positionality Tool as part of the *Data Ethics Toolkit for the Participatory Sciences* to help those leading participatory science projects recognize and manage non-epistemic values by designing and implementing data governance in ways that satisfy ethical obligations to participants and reduce power differentials (Cooper et al. 2022). A subset of members of the *Inclusive, Diverse, Equitable, Accessible, Large-scale (IDEAL) Participatory Sciences* working group revised the Tool into what's presented here by drawing on literature and lived experiences. We synthesized several approaches to create a positionality tool for the participatory sciences through which project leaders can explore how who they are influences their project decisions. We considered the content and limitation in positionality statements, such as reviewed by Hampton et al. (2021), who noted that positionality statements typically disclosed identities, experience, opportunities, and personal journeys, while fewer contained thoughts on accountability and lessons learned (Hampton et al. 2021). Secules et al. (2020) noted that in most positionality statements researchers positioned themselves as researcher-as-instrument only abstractly relevant to the research study, while fewer disclosed personal attributes and efforts to mitigate bias and establish trustworthiness. Even fewer expressed positionality as necessary to interrogate the research methodology and its complexity.

We expanded the Social Identity Mapping tool of Jacobson and Mustafa (2019) to include considerations of lived experience, assumptions about knowledge production, and one's institution (Secules et al. 2020). Additionally, we drew from Savin-

Baden & Major (2013) who provided three directions to examine positionality, which are in relation to (1) the study topic under investigation, (2) the research participants, and (3) the research context and process. Ultimately, we settled on reflections of how one's characteristics, attitudes, values, prior experiences, and assumptions could affect (1) study topic, (2) research questions, (3) recruitment and engagement, (4) data collection, (5) data sharing, (6) reciprocity, and (7) data governance and project decision-making. We hope that the Positionality Tool will guide reflecting and thinking reflexively on these various aspects of one's own identities, attitudes to science and knowledge, and participatory science projects, such that those in leadership roles can address the aspects of positionality that are often ignored when assessing positionality (Hampton et al. 2020).

Positionality Tool

We intend for project leaders individually, and/or project leadership teams collectively, to use the tool actively and iteratively (Figure 1). Although some elements of one's positionality are immutable, one's overall positionality is not static, but changes over time and with context. Although the Positionality Tool has value even in using it once or in approaching it as an academic exercise, it is most valuable when embedded throughout the course of a project or one's career. For example, a leader of a biodiversity monitoring project might recognize that they are able-bodied and modify their project protocols so that people with limited mobility can participate, and later they might recognize that their affiliation with a university led to their choice of open data policies, which were suitable for engagement in public parks but not on tribal lands. A decision to undertake

positionality work can be a collaborative decision and itself an opportunity to think and act with a lens of positionality. For many, examination of positionality involves a leap to simply acknowledge that their views are not inevitable, but a product of who they are (Takacs 2003). The tool is two-part: the first part involves reflecting on personal identities, lived experiences, beliefs and assumptions about knowledge systems, and “baggage” of institutional affiliations as relevant to one’s perspective, and the second involves reflexivity on how these characteristics in the context of society have shaped one’s perspective and informed the design and implementation of the project.

Part 1: Social identities and lived experiences

The first part of the Positionality Tool involves recognizing multiple dimensions of oneself (social identities and lived experiences) and how one is situated in the work (beliefs and affiliations). When considering one’s various social identities, consider where each identity is situated with respect to dominant cultures and norms, privilege and marginalization. For example, relative to dominant culture norms in the U.S., if you were a White, Christian, male, these aspects of your identity might be privileged, while if you were also gay, this aspect of your identity might be marginalized. Privileged and marginalized dimensions of one’s identity can both exert influence on project design. When exploring social identities, also consider whether multiple identities expose you to multiple systems of advantage or disadvantage? For example, being both Black *and* female means experiencing systems of racism *and* sexism. Intersectionality, coined by Kimberlé Crenshaw (1989), describes the compounding impact of intersecting systems of oppression.

Lived experiences may have clear ties to social identities such as race-based microaggressions, sexual harassment, and age discrimination, or less clear ties, including housing and food security, employment, economic security, schooling, recreation, degree of travel, and many more experiences. A narrow set of lived experiences might influence your ability to empathize with others with different lived experiences or to identify relevant issues to diverse lived experiences. .

How one is situated within the work includes beliefs and affiliations. When considering belief systems and related assumptions, recognize that scientists often have different epistemological beliefs than those who are not scientists, and more likely value western scientific approaches over other approaches. Belief systems might determine how researchers think about the relationship between themselves and participants. For example, a project leader with a hierarchical view of science might manage volunteers as instruments of the researcher, and a project leader with a decolonial view might manage the researcher as an instrument useful to participants. Assumptions that align with dominant cultures and norms are often implicit. For example, one characteristic of dominant culture is the authority of the written word which may cause project leaders to overlook the value of other forms of wisdom and communication.

The affiliation of project leaders may influence real and perceived intentions towards social justice. For example, each state in the US has state-run institutions of higher education that were established on lands taken from Indigenous nations. These

institutions also have current practices that exploit, extract, and harm communities of color, like helicopter science (Haelewaters et al. 2021). Many old and dominant-culture institutions that project leaders may be associated with can perpetuate social inequities. Newer, multicultural institutions may have greater potential to disrupt social inequities.

Part 2: Impacts on project design and implementation

The first part used alone can lead to unproductive self-absorption and a 'laundry list' of characteristics. The first part must be followed by the second part of the Positionality Tool, which guides project leaders to think reflexively about how dimensions of the positionality influence and shape various elements of project design. Reflexivity is not a solitary act. In order to see the influence one has on a project, reflexivity involves taking a position external to oneself in order to differentiate the observer and the observed (which in this case are the same individual). For each aspect of project design (topic, research question, engagement, data collection, conclusions), the Tool prompts reflexivity on the influence of one's social identity, lived experience, beliefs and assumptions, and affiliation to help direct critical self-awareness in these areas.

A project leader's social identities or lived experience may affect the project research questions. For example, a project about biodiversity conservation might cause a project leader to consider whether they live among low or high biodiversity, or whether they hold the view (common in many western cultures) of humans as separate from nature. If a project is about air pollution, they might consider whether they live in an area with high or low air pollution or other environmental burdens. There are multiple ways that any

research topic can be framed or discussed to connect with people who have varied identities. For example, a study about tomatoes could be framed around gardening, food security, soil contamination, or land sovereignty. A study about biodiversity could be framed around nature conservation, equitable access to greenspaces, or human health benefits of exposure to nature. The project leaders' lived experience may shape what they prioritize as important or which study areas they perceive to be "hot" topics. Institutional affiliation or funding source may keep some topics off-limits.

A project leader's multiple identities and lived experiences might create both insider and outsider status with the potential participants they engage. For example, a project leader who is a parent might configure project protocols that can be done as a family activity. On the other hand, project leaders who hold well-paying salaried positions with flexible work hours may assume that participants hold a position with the flexibility for daytime activities and the salary for volunteering. At the same time, a project leader's epistemic beliefs might place them as an outsider. A Science, Technology, Engineering, Math (STEM) professional leading a project may believe that hypothesis-driven, basic research is best for society, while potential participants may believe that science is exploitative.

Privileged aspects of a project leader's positionality might lead to non-inclusive or inaccessible design. For example, a nondisabled project leader might design protocols that assume participants can hike two miles even though a stationary alternative could be valuable. A project leader who has not experienced risks to their wellbeing in public (i.e., from harassment, profiling, violence), might not consider how to support safety concerns

of various groups, like women alone at night, Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual (LGBTQIA+) in rural areas, or people of color in white suburban neighborhoods.

A project leader's positionality can shape their sense of obligation to participants with regards to sharing and drawing inferences from data. For example, a project leader sensitive to academic advancement or status may be motivated by conventional promotion metrics and overly focused on hitting recruitment or sample size targets for a publication on basic research. Yet participants may care more about the potential positive applications of the study to themselves or their community. This also highlights the way that institutions can affect projects. It is possible that the researchers at any stage in their career but especially early in their career would prefer to do community-engaged work but may have the institutional pressure to "publish or perish" and a lack of incentives to take the needed time to establish relationships, communicate findings back to communities, and advocate for solutions.

With regard to reciprocity in project design, project leaders' positionality might lead to conflicts of interest or conflicts of needs with participants. In some situations, study results could be interpreted in ways that perpetuate stigmas or stereotypes and project leaders may be positioned to prevent harmful interpretations. For example, if a scientific publication of results that reveal environmental problems might lower real estate property values of participants, a project team might put the results in a policy brief to advocate for resources to fix the environmental problems. In other situations, project leaders'

positionality might shape projects to produce benefits for participants such as data reports and credibility to support advocacy on an issue. One's positionality can also affect their preparedness to make project-related decisions related to data use and governance. For example, those with the technical expertise to manage the participant-generated data do not necessarily have the expertise to be the ones making final decisions about the terms and conditions for its use (Cooper et al. 2022).

Product or Practice?

We encourage use of the Positionality Tool primarily as a process internal to project leaders with the goal to avoid the false neutrality of research. It may or may not be beneficial to publish or share a positionality statement with participants. Below we provide several cautions about creating an expectation on sharing positionality statements with participants, and even cautions about the hidden costs of the process of examining positionality (Massoud 2022).

Caution 1: Avoid equity tourism. Sharing positionality statements could become an empty performative act and what Lett et al. (preprint) refer to as 'equity tourism', when practitioners pivot to equity work briefly with superficial understanding. Develop the necessary skills and knowledge base for equity work to avoid performative equity tourism.

Caution 2: Avoid laundry list. Positionality exercises can become self-indulgent narratives dominated by lists of identities or internal struggles (Kobayashi 2003). Rather than using the Positionality Tool alone, we echo Kohl and McCutcheon (2015) and what they called "Kitchen Table reflexivity," and encourage colleagues to discuss their positionality, in formal or informal conversations, to help unpack the complexities.

Caution 3: Statements run the risk of conveying a static positionality. Positionality is contextual and dynamic and some uncertainty will always remain in our ability to understand our influence on a project (Rose 1997).. For example, Herod (1999) explored how he (as a researcher) consciously managed his positionality for a given situation: he presented himself as harmless Brit to foreign academics, as Dr. when he needed to convey status, as not Dr. when didn't want to be associated with the ivory tower. Rather than think about positionality as a static thing, consider how your positionality might change over time or in different settings.

Caution 4: Statements create vulnerability and safety risks. For those with privileged identities, being vulnerable may be uncomfortable, particularly at first, but this type of discomfort is an opportunity for personal and professional growth. For those with marginalized identities, sharing positionality could be an 'outing' that places one in danger, can increase the sense of tokenism (Niemann 1999), might divert attention away from the intellectual contribution of the researcher, and the process might be a reminder of one's negative social experience(s) and (micro)aggressions, and recalling these traumas can ultimately reduce resilience (Massoud 2022). Furthermore, due to unconscious bias, publishing positionality statements may negatively interfere with the peer review process (Massoud, 2022). Consider the costs and benefits of revealing your positionality, to yourself and others, as part of your reflection on positionality.

With those cautions in mind, we decided to structure the Positionality Tool to prompt reflection and reflexivity and not as a fill-in-the-blank template for making a statement.

Challenges of Positionality within Dominant Culture

Project leaders with many privileged identities and lived experiences may find it hard to gain clarity on their positionality and how they shape or bias a project (Takacs 2003). Instead, a common pattern in positionality work is that each researcher tends to reflect upon their most marginalized characteristics with less examination of privileged identities. For example, those who are not disabled are unlikely to reflect on how their ability status shapes their positionality. We encourage project leaders to reflect intentionally on each intersection of privilege or marginality experienced for each element of their positionality lens. Privileges are more likely to lead to decisions that align with dominant culture and support the status quo, which can be mistakenly interpreted as neutral or without bias. Thus, it is particularly important to examine privileged aspects of positionality in order to make decisions that do not reinforce systemic racism, ableism, sexism, etc.

When the majority of people have similar privileges (social identities, lived experiences, etc.), it tends to underpin the notion that the consensus perspective is the default and therefore objective perspective, and that different perspectives are subjective or false (Riley 2017). For those with many privileged aspects to their positionality, the concept of double consciousness might help explore the impact of one's positionality on one's project. Double consciousness refers to the realization that more than one truth is possible at any moment depending on one's social position (Pease 2000). For example, it is true that scientific discoveries have improved human wellbeing while it is simultaneously true that scientific discoveries have harmed human wellbeing. One truth does not necessitate denying the other.

Reasons to Use the Positionality Tool

Not recognizing how one's positionality influences research design can threaten the integrity of the research and limit equity and inclusion. Critically examining positionality should reveal the complexity that practitioners add to participatory science projects.

Research integrity: The origins of positionality statements in conventional social science studies were to support research integrity.. In the social sciences, researchers explore and explain their positionality, recognizing that one's ontological, ethical, and epistemological beliefs influence one's research. Similarly, the leadership teams of participatory science projects can examine their positionality in order to recognize biases, blind spots, and hidden spots .

Ethical data practices: In the context of participatory sciences, examination of positionality can help researchers consider ethical obligations to participants and identify ethical tensions in the project. Examining values in participatory science has the potential to allow political, social, moral, and economic values of a wider array of people to influence science in appropriate ways. For example, assumptions about the epistemological superiority of western science may limit ethical data practices by devaluing other epistemological approaches such as eastern science (Motokawa, 1989), feminist and intersectional science (Bang et al. 2012), and indigenous knowledge (Nadasdy, 1999) and data sovereignty. Assumptions about credential-based hierarchies in science can function to exclude and discount other voices in contrast to beliefs in a human right to science (Vayena and Tasioulas 2015).

Participatory research involves a collection of people who are likely more heterogeneous than traditional collaborations among professional scientists. Ethical choices sometimes require going against one's self-interest. Examination of positionality can help project leadership teams recognize their interests as not being the only relevant interests.

Equity and inclusion: Examination of positionality can help support and inform approaches to diversity, equity, inclusion, and accessibility in the participatory sciences. A few recent studies found that contributory projects engage only particular segments of society, with disproportionate numbers of participants who are white and higher than average socio-economic status (Alf et al. 2022; Pateman et al. 2021; NASEM 2018). Given the thousands of large-scale participatory science projects, across disciplines and sectors, guidance on retrofitting equity, inclusion, and accessibility is needed and requires extensive and extended attention (Bevan et al. 2018). Many projects generate geo-referenced data from participants in the locations of their choosing, often near their home. Given the persistent spatial segregation based on race and socio-economic status in the US, significant spatial gaps in data are a potential consequence of social disparities in participation (Mahmoudi et al. 2022). Therefore, lack of engagement of participants in groups historically and currently excluded from STEM could limit both potential for the democratization of science as well as scientific productivity.

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Figure 1. Summary Table from the Positionality Tool.

When using the Positionality Tool (found in the Supplemental Documents), sit with rather than rush through the question prompts. Write your answers first by yourself, then revisit the questions in discussions with others and revise as you gain new insights. Treat the tool as a living document. Revisit it whenever you encounter contrast – people, settings, circumstances different from typical for you. After you complete Part A of the tool, you may find it helpful to use the summary table to complete Part B.