

5 WOMEN AS KNOWLEDGEABLE: EXPERTISE AND COMPETENCE IN CLIMATE CHANGE

Glenda met me for our interview at a busy coffee shop in London. She bustled in with her bike and helmet, ready to talk about any topic I threw at her. Her legal training shone through as she rattled off names, dates, and specific environmental cases effortlessly. She traced the start of her environmental work to 1992, when she helped start a bicycle group in her community. She recalled the enthusiasm about environmental issues in the UK and elsewhere that year as it coincided with Rio Earth Summit. Since that time, she has continued community-level action on environmental issues as well as working as an environmental lawyer. She has done a great deal of legal work on fracking, among other environmental issues, and has insisted on using a climate change lens to frame arguments against fracking. In the course of our conversation, she mentioned several prominent female figures who she thinks play an essential role in climate change. Focusing mostly on political and diplomatic expertise, she mentioned female politicians, women who lead environmental organizations, and women playing a role in global negotiations. In her view, “Female leadership is very important. I mean if you look at Christiana Figueres and what she’s doing. She’s in the, she’s almost like the beacon in it.” For Glenda, women are active and knowledgeable participants in climate change work.

In a book on women and climate change, it is perhaps unsurprising to find discussions of the discourses examined in the two previous chapters, women-as-vulnerable and women-as-caregivers. Women’s vulnerability, particularly associated with care roles, is firmly established in the popular imagination as well as global policy debates. We now turn to quite a different

perspective on the position of women. As illustrated by Glenda's story, participants regularly considered themselves and other women to possess valuable knowledge that is essential to addressing or understanding this global problem. This chapter explores the *women-as-knowledgeable* discourse.¹ It first describes perceptions of women as well-informed about climate change. This knowledge is seen to manifest in women being less likely to engage in climate skepticism, and to educate others about climate change. The chapter then examines some of the roles that interviewees identified for knowledgeable women. These roles specifically include climate change leader/diplomat, climate change educators, and climate change researchers. I also analyze some instances in which participants had to push back when their expertise was called into question. I close with some implications of the *women-as-knowledgeable* discourse.

KNOWLEDGE, EXPERTISE, AND CLIMATE CHANGE

Many scholars have studied the links between knowledge, expertise, and climate change (Pettenger 2007). Research covers such topics as the role of local knowledge (Naess 2013; Reyes-García et al. 2016) or indigenous knowledge (Alexander et al. 2011; Green and Raygorodetsky 2010) in climate change mitigation and adaptation. This work is often motivated by the argument that climate change debates have been dominated by elites and that effectiveness or equity goals or both require this to change. Additionally, research examines linkages between climate change knowledge and belief in climate change occurring (Guy et al. 2014),² connections between climate science and policy (Meyer 2011), and the dominance of the global North in perceptions of expertise and publications about climate change (Pasgaard and Strange 2013; Pasgaard et al. 2015).

There is also literature that examines the specific place of gender in climate change knowledge or expertise, including feminist work exploring how power relations shape our knowledge and assumptions in fields such as climate science (Israel and Sachs 2012; Moosa and Tuana 2014; Tuana 2013) and climate economics (Nelson 2007). This work examines how climate

science and climate economics center concepts such as “value-neutrality” and “objectivity” in ways that reinforce existing gendered power dynamics as well as limit our approaches to understanding and addressing climate change (Moosa and Tuana 2014). Other work examines how gendered divisions of labor produce specific forms of climate change knowledge (Agarwal 2009; Merchant 1995; Warren 1997). These studies often include an argument that this gendered climate change knowledge necessitates women’s inclusion in climate change decision-making (Terry 2009). For instance, Trish Glazerbrook (2011) uses the case of women subsistence farmers in northeast Ghana to argue that women tend to play specific social roles that render them uniquely vulnerable to climate change while also affording them specific information relevant to climate change policy.³ She claims that “attention to [women’s] situations in responding to climate change must focus not only on their experiences as victims, but also on the contributions they can make to the climate struggle as resilient and expert actors” (Glazerbrook 2011, 769). There is thus both a justice and a sustainability component to the argument: it is just to include women because they are particularly vulnerable, and it is practical and helpful to include women because it allows for fuller climate change knowledge that is important to mitigation and/or adaptation efforts. At the same time, some scholarship warns of the dangers of coopting women’s environmental or climate change knowledge (Dey, Singh, and Gupta 2018; Dove 2006; Federici 2009; Sapra 2009). These studies call attention to women’s environmental knowledge being treated as merely an input in climate change policymaking without women also being recognized as stakeholders and experts.

Anna Kaijser and Annica Kronsell (2014, 419) expand on this idea by offering an intersectional analysis of climate change:

Intersectionality can generate alternative knowledge crucial in the formulation of more effective and legitimate climate strategies. Intersectional analysis has a normative agenda, as feminist and critical theories generally do. It is related to the feminist epistemological position that regards knowledge as derived from social practice. This way, intersectionality also highlights new linkages and positions that can facilitate alliances between voices that are usually marginalised in the dominant climate agenda.

This perspective reflects on ways that multiple positions intersect to influence climate change knowledge. Within views like these there is no such thing as a generic “women’s climate change knowledge.”

Another strand of the literature looks at connections among gender, climate change knowledge, and climate denial (Anshelm and Hultman 2014; McCright and Dunlap 2011; Nagel 2016; Smith and Leiserowitz 2013). Existing empirical work lends strong support to the idea of gendered patterns of climate skepticism or denial. For instance, Aaron McCright and Riley Dunlap (2011) find that in the United States white, conservative males are more likely than other adults to express climate change denial. In the same study, they also report that those white conservative males who positively assess their own understanding of climate change express an even greater degree of climate skepticism than others. This denotes that while these men are highly confident about their own levels of knowledge, this confidence is misplaced. These conservative men underestimate the likelihood of climate change occurring, the causes behind it, and the level of consensus within the scientific community about these points. Another study conducted with a sample from the United States finds that whereas evangelical Christians in general tend to perceive climate change as less of a risk than non-Evangelicals, Evangelical women tend to assess climate change as a risk more frequently than men within this group (Smith and Leiserowitz 2013).⁴ The finding that men, and particularly conservative men,⁵ are overrepresented among those who express climate denial positions holds for other research using data from Brazil, New Zealand, Norway, Sweden, and the United Kingdom (Anshelm and Hultman 2014; Jylhä et al. 2016; Krange, Kaltenborn, and Hultman 2019). These are all countries that have seen significant shifts in economic sectors over the past few decades, including the decline of manufacturing and shifts away from fossil fuel. Paul Pulé and Martin Hultman (2019) argue that the “industrial breadwinner masculinity” present in these states responds strongly against forces that appear to threaten its privileged position.⁶ This includes gendered patterns of climate denial.

While there is a committed segment of the global population that persists in climate denial, trends indicate that this may be a shrinking group (Poushter and Huang 2019).⁷ Climate skepticism has declined in the United

States and Europe, regions where most interviewees live. A 2018 study on climate change attitudes in the United States found that 73 percent of those surveyed think climate change is occurring (Leiserowitz et al. 2018).⁸ This represents an increase of ten percentage points since a March 2015 study. Only 14 percent of the respondents think global warming is not occurring. Likewise, a 2017 Eurobarometer report found that 92 percent of the respondents believe that climate change is a “serious problem,” and 74 percent of them consider that climate change is a “very serious problem” (European Commission 2017). The latter number is up from 69 percent in the previous 2015 Eurobarometer poll. While responses vary for citizens in different parts of the European Union, some of these regional differences have narrowed (European Commission 2017).⁹ There are also gendered patterns in the responses. Women are slightly more likely to say that climate change is a very serious problem than men (76 percent to 72 percent) and are slightly more likely to indicate that they have taken personal action to fight climate change (51 percent to 48 percent) (European Commission 2017). Several of the themes and findings from the academic literature on knowledge and climate change also appear in the women-as-knowledgeable discourse. The following sections will specifically explain the study participants’ views about how gender plays a role in acquiring and assessing climate change knowledge.

Women’s Knowledge and Climate Skepticism

Two key storylines that fit together in the women-as-knowledgeable discourse are the idea of women-as-knowledgeable-about-climate-change and women-as-concerned-about-climate-change. Interviewees described women knowing a great deal about climate change in a general sense as well as having unique comprehension of climate change processes and impacts. Janice, who works in the nonprofit sector in the United States, reflected on women’s attitudes about climate change and how women and men might diverge in their approach to the issue. She noted that “especially when you talk about denial, the manufactured denial which has largely been, you know at behest of the fossil fuel companies, what we see in the polling that we look at is that the women are much less susceptible to those messages than the men are.” This perspective was shared by Kristy, who works for a climate research group at

a university in the United States. When I asked for her initial impression of the phrase “gender and climate change,” she responded:

Retired white males . . . What do I mean by that? Any time I’ve given public presentations it is usually the retired white males that are the grumpy ones who are going to make some claim about sunspots, or yeah, climate change being “natural.” That sounds so calloused, but I mean it’s true. But to their credit I will give them credit for showing up. I mean there a lot who wouldn’t . . . but it is kind of funny because you can usually pick them out.

In her experience, men—and particularly older white men—were more likely than women to express climate skepticism at her lectures.¹⁰ Their references to “sunspots” or naturally occurring patterns of climate warming and cooling might indicate that these people tend to feel more confident in their own expertise on matters of climate change, although in fact, these common climate skeptic talking points have been largely debunked in scientific scholarship (IPCC 2014b). This view that women are less represented among the population of climate skeptics was repeated by participants in the academic and nonprofit spheres. They pointed to evidence from polling data, experience in their classrooms, interactions with members of the public at speaking engagements or public outreach events, or conversations with people in their lives of women being less likely to publicly express climate skepticism.

As discussed above, existing empirical work lends strong support to the idea of gendered patterns of climate skepticism or denial (McCright and Dunlap 2011; Smith and Leiserowitz 2013). Many participants mentioned that, in their experience, women tend to voice greater concern about climate change. In the words of Sharon, a clean energy specialist in the United States,

I see in my reality that there are more women usually on one side of the debate and men on the other. Women on the “Yes climate change is real, and we need to act now.” . . . The first thing I think of is women are better suited . . . traditionally . . . to jump into this belief, to join the fight, so to speak.

For Sharon, you cannot have climate change action without first having some awareness of the basics, as well as the scale of the problem. This is one way in which interviewees established a connection between women’s knowledge and concern about climate change. Another link between women’s

knowledge and environmental concern is that of mothers passing on climate change knowledge to their families. This mothers-as-educators storyline emerged in multiple interviews and serves as a bridge between the women-as-knowledgeable discourse and women-as-caregivers discourse explored in the previous chapter. German nonprofit worker Lyra, for example, posited that organizations need to think long term about climate mitigation and adaptation projects to better plan for the future. She said that women need to be active participants of community-based projects because they will be the ones who can pass the knowledge on to their kids. Swati, an environmental nonprofit worker in the United States, highlighted these links, noting “the role of women as, like, storytellers in their families, and passing along those stories to the next generation of how things used to be, and kind of . . . seeing firsthand.” She likened this process to indigenous communities teaching their members to think several generations into the future. She wondered, “If we adopted that, how different would our policies be, and our choices be?” Swati reflected on how her own views were shaped by her upbringing:

I’m an immigrant to this country, my parents and I moved here from India when I was really young, like three or four, so I was always raised with that environmental ethic of conservation and our own conservation of our consumption. . . . So, we still always treated it as, “You turn off the lights!” . . . I had some colleagues stay over last week, and they just keep the lights on. They leave the room, and they keep the lights on. I’m like, “What are you doing?” Yeah, and it’s just, like wow, when that gets instilled in you as a little kid like that’s a habit . . . that you can’t break.

Swati recognized her parents’ lasting influence on her attitudes and practices related to the environment. To this point, Sina claimed that she specifically likes to do outreach to mothers with her US-based nonprofit since they bring information about climate change home to their families. Additionally, US-based Elane mentioned that women have the capacity to teach their children about climate change and therefore help usher in necessary change. Sina and Elane both argued that this educating role is something very “powerful.” Since knowledge production and understanding of climate change are socially conditioned, early exposure to pro-environmental information can potentially shape behavior for future generations, an argument that has some empirical support (Matthies, Selge, and Klöckner 2012; Matthies and Wallis 2015).

While a few interviewees suggested that they see women as more likely to care about environmental change and climate change in particular, others claimed that this does not necessarily translate into changes in policy or other types of action. Vicky works for an environmental organization in the UK, and she recounted seeing a study that finds that “young women in the UK are the demographic who are the most likely to say they care about climate change, but also the least likely to ever talk about it. And they think that’s because women are more aware of what’s socially acceptable around them and they pick up on the fact that it’s not socially acceptable to talk about climate change.” This unwillingness to talk about climate change publicly for fear of backlash speaks to the social and politicized nature of climate change assessment and knowledge. While exposure to pro-environmental messages might influence children’s behavior, those same people are subjected to additional socialization that gives them clues about what behavior will be rewarded or punished.¹¹

Where Does Environmental Knowledge Come From?

One storyline in the women-as-knowledgeable discourse is the idea that women have specific forms of knowledge. Participants often linked this to gendered divisions of labor in households or communities. Vanessa reflected on this in terms of who takes part in different types of activities hosted by her Scottish environmental nonprofit. She mentioned that men tend to get involved in energy or transportation projects, while women are more likely to participate in recycling or food waste projects. When I asked her why she thinks that might be the case, she said:

I mean, I hope it’s not because people are conforming to traditional gender stereotypes, but I mean, it might be that women are more involved in the cooking and therefore more, have more knowledge of the waste that goes along . . . things like that. And I really don’t know . . . I guess there is still a bit of that—a predominance of men in . . . the energy-type sector, the engineering . . . that side of things. Maybe there are more men with more knowledge of that area who therefore transfer that over to their . . . that kind of work.

In her view, gendered divisions of household labor might influence the kinds of issues that one is most aware of. With women perhaps playing an oversized

role in food shopping and preparation in many families, the issue of food waste might be more readily on their radar.

As discussed in chapter 3, women are frequently cast in the role of “worker” within the interviews as well as general discussions of climate change in the media, policy community, and academics (Arora-Jonsson 2011). Multiple interviewees specifically identified women’s work in agriculture as well as food and water collection as contributing to their climate change knowledge and their ability to understand when climate change impacts are occurring. They commented on gendered patterns of men engaging in growing crops for profit, for example, and women engaging in subsistence farming. Kit, for one, brought up her experience studying resource management in Nepal to point out these gendered differences:

Women harvest leaf litter and firewood. Men cut timber that takes them to different areas of the forest. So, they have a different understanding of different areas of the forest. . . . The women’s is kind of more daily and local. So, the way that they would experience any impacts from climate change on the forest would be different to the way men do.

Eva, a nonprofit worker in Germany, made a similar comment about women’s environmental knowledge in places where they are responsible for finding water or biomass for fuel:

It’s the women who know best. They are very familiar with the changing environment and the dangers that it might entail. So, any effective solution should be developed in close coordination with local women, I would say.

Whereas Kit drew specifically from her fieldwork, and Eva referred to a general “local women’s” perspective, both highlighted gendered divisions of labor and women’s knowledge in rural areas of the global South¹² in ways that illustrate connections between the women-as-knowledgeable and women-as-vulnerable discourses. Interviewees argued that gendered divisions of labor for rural women in the global South afford them specific forms of knowledge about environmental processes, but this position also makes them uniquely vulnerable to the impacts of environmental change.

However, a few participants worried that a focus on women’s resource knowledge can be incorporated into climate change debates in ways that are

not necessarily helpful for women's full participation in the conversation. Again, when interviewees mentioned women as resource users, they were typically referring to rural women in the global South, who typically lack a strong voice in political decision-making and are rarely regarded in climate change policy spheres as "experts." Rather, these women tend to be viewed as having specific pieces of environmental knowledge, which does not qualify them for the same position at the decision-making table as the experts (MacGregor 2006). Darcy, a US-based scholar, expressed frustration with the trend of strategically "using" women's knowledge without necessarily giving them the same status as authorities on environmental change or viewing them as equal participants. She brought up women "specifically being called upon to combat climate change as mothers of the earth and certain gendered, patriarchal norms that they can play into how we turn to women to combat climate change." Marie, a German nonprofit worker, also pushed back against this instrumental approach to women's knowledge by asserting that they should have a role in finding solutions. "Well, I think that if you try to solve a problem, you should definitely get those who are, who are affected by the problem have a seat at the table. So, in this regard, women probably have knowledge of solutions or should be involved at least [to] an equal extent as men into solutions to climate change."¹³ In this view, women should be included in decision-making since they are both well-informed and disproportionately impacted by the problem. This concern about the global community using rural women in the global South, or other marginalized groups, as sources of information rather than as stakeholders also appears in academic work (Dey, Singh, and Gupta 2018; Dove 2006; Federici 2009; Sagra 2009). Hence, women's participation is regarded as necessary to achieve sustainability goals as well as justice goals.

ROLES ASSOCIATED WITH KNOWLEDGEABLE WOMEN

While the preceding section discussed women's climate change knowledge in general terms, the interviews yielded a picture of specific jobs or roles related to expertise that women assume in climate change spaces. The image of knowledgeable women took several forms, including climate change leaders or

diplomats, researchers creating data and information, and experts providing knowledge to various actors. It is important to note that these roles are not mutually exclusive. In fact, interviewees identified multiple, simultaneous roles that relate to climate change expertise. Some took on a defiant tone when identifying specific tasks that women play because of their position as experts on climate change—usually after an observation that many climate change spaces continue to be dominated by men. For them, the fact that women play these expert roles and possess knowledge and valuable skills means that women are an essential part of the climate change realm and should be respected accordingly.

Climate Change Leaders

Participants referred to women as “climate change leaders” or “effective negotiators” multiple times.¹⁴ “Across the globe, when women are . . . empowered politically, we see big changes” was US-based nonprofit worker Gwen’s comment on women’s position in climate change. Additionally, German nonprofit worker Marie’s initial response to the phrase “gender and climate change” was that

As a field, climate change policy has shown more women leaders than in other, in other fields of policy, let’s say, in general. Especially within the climate change negotiations. Christiana Figueres is of course the big leader of all, but I think [women’s participation] was quite visible at the negotiations in Paris. . . . There are quite a lot of women that are involved in solving the issue and [they] tend to play more of a leading role than in other sectors.

Like Marie, other interviewees specifically identified Christiana Figueres as a woman who is widely recognized for her prominent role in global efforts to combat climate change.¹⁵ She was the Executive Secretary of the United Nations Framework Convention on Climate Change (UNFCCC) from 2010 to 2016. She is often credited with playing an essential role in getting the international community to finally sign on to the Paris Agreement.¹⁶ Numerous outlets praise her proficiency in climate change diplomacy. She is called a “world authority” on global climate change (World Resources Institute 2018), as well as “a widely published author on the design of climate solutions” and “a frequent adviser to the private sector” (United Nations Climate Change

2019). These accolades underscore a unique skill set and wealth of knowledge pertaining to climate change negotiations. Participants typically had a note of pride in their voice when they mentioned Christiana Figueres. They seemed to regard her accomplishments as evidence of women's potential and proof of their ability to play a key role in climate change.

Brooke, a scholar in the United States, is an example of someone who mentioned Christiana Figueres in her initial reaction to the phrase "gender and climate change." She went on to discuss "the role of women as negotiators and leaders in the climate arena" and specifically identified women as the ones "who basically gave us the Paris Agreement." Lyra also referenced women's participation in climate negotiations.¹⁷ She works with delegates to the United Nations Framework Convention on Climate Change (UNFCCC) from small island states in her role at a German climate nonprofit. She reflected on the strong representation of women in the groups that she works with, specifically on the finance team. Lyra also mentioned their coordinator, who is an ambassador to the UN:

[She is a] really experienced negotiator and she coordinates the whole group . . . and a lot of young women from ministries of other countries, or like me from research organizations in the team. And I think for all of us it's very cool and also important to see what she does and how she's doing it. And I can even see just from being in this team for three years, how a lot of the young women in the beginning who were very, very shy have now been empowered . . . kind of . . . through working with her in this team where she also gives them the opportunity to speak or to prepare a certain issue.

Lyra's comments speak to women's knowledge and position, as well as what this means for other women in a group. She argued that the presence of an experienced negotiator allows others to learn from her. This is also facilitated by the fact that she gives them opportunities to grow. Lyra referred to young women being "empowered" by this process of mentorship and participation. However, for "empowerment" to occur, women must be present in the first place.

Women's participation in global climate change negotiations has been increasing over the time, yet it is still relatively low compared to the stated UN goal of gender balance. The international community recognized the need to improve women's participation in negotiations in 2001 at the

UNFCCC Conference of the Parties (COP) 7 in Marrakech. There was a follow up in 2012 through an additional decision on promoting gender balance at COP 18 in Doha, Qatar. The figures for women's participation at COP 24 in 2018 and associated meetings lagged well beyond a goal of gender parity, with women making up just 38 percent of party delegations and 27 percent of heads of delegations (UNFCCC 2019).¹⁸ While these figures represent a modest increase from the previous year, they reveal that women remain underrepresented in UNFCCC gatherings. However, women have played a large role in the Women and Gender Constituency (WGC) at the UNFCCC. This group provides avenues for civil society and nongovernmental organizations (NGOs) working on gender justice, environmental protection, or both, to shape the UNFCCC and annual meetings. It has been recognized as one of the nine official observer constituencies within the UNFCCC since 2011. Even though women's participation as delegates in climate change negotiations continues to lag behind men's, some interviewees identified this as an area in which women's climate expertise is on display and where their involvement is necessary. None remarked on the other forms of women's participation in climate change negotiations like the WGC. This means that while they recognized women's expertise and underrepresentation in "official" channels, they were not aware or else failed to mention these other forms of expertise and participation.

Commenting on women's knowledge and political adeptness, Gwen, who works for an environmental nonprofit in the United States noted that women in positions of political power are more likely to achieve legislative wins on climate change, often through compromise.¹⁹ This women-as-leaders storyline manifested when participants suggested that women are particularly skilled at incorporating multiple voices into the policymaking process, as well as thinking broadly about complex issues such as climate change. Interviewees argued that women are more likely to listen to other perspectives, are more likely to be among those working to diversify the environmental movement, and are better at including marginalized peoples, including other women. These characteristics speak to their ability to be effective in achieving climate change action, particularly in ways that are also sensitive to social justice goals.

Some participants specifically mentioned women's ability to view climate change "broadly" or "holistically." An example comes from Brenda, who works for an environmental nonprofit in the United States:

I think that the solutions that we need are going to come from a different place and a different type of thinking than that type of thinking that we have used for the last, you know, hundreds of years—since the Industrial Revolution. And that is a more traditionally feminine type of thinking. It is a slower, more holistic, more community focus, less profit driven, more labor, less technology . . . maybe. You know, using technology in a way that supports people as opposed to exploits people. And I think that's a traditionally gendered way of thinking.

Brenda went on to say that while holistic thinking is traditionally feminine, men are perfectly capable of viewing global issues this way. While there are men currently doing this work, we need large-scale changes in perception so that they feel comfortable and supported when they advocate for this kind of approach as well. Her comments indicate that women are accustomed to viewing the world in ways that are beneficial for climate change action. She regarded their perspective as valuable for driving the societal shifts necessary for achieving sustainability. However, existing scholarship indicates that the mere presence of women within institutions does not always correspond with progressive policies, a point elaborated on in the next chapter (Magnusdottir and Kronsell 2015).

Knowledge Creator

Participants also identified a strong role for women in the creation of knowledge about climate change, often by referencing women's work within the scientific community. One interviewee pointed out that "there are lots of women in science overall, including strong representation in fields like botany and marine biology where a lot of the work monitoring the effects of climate change on ecosystems is being done." Others mentioned that "the climate scientists that are out there now talking about the issues—Katherine Hayhoe, Heidi Cullen—these are women who are leaders in their fields." As in the case of Christiana Figueres discussed above, these mentions of high-profile women in climate science were accompanied by a tone of pride that women's position in their field is recognized.

Multiple participants identify as scientists and have training and/or are working in a natural science field. They frequently discussed women's capacity for research in their responses. For instance, Heather, a biologist/biogeographer who works at a university in the United States, thought that "women do fabulous science. We just haven't had the opportunity to do fabulous science for a very long time, but I don't think of [climate science] as something that is by nature masculine at all." For her, the ability for women to do great science is unquestioned. While she pointed out some of the challenges that women can face in natural sciences, she argued that these do not speak to women's capacity for scientific research.

Additionally, Jasmine, a US-based expert on plants and climate change, said that she decided to become a scientist in order to gain specific kinds of knowledge in her field, which facilitates her voice being valued. She argued that this knowledge makes her credible. Jasmine also indicated that her position in science allows her to recruit other women, particularly other women of color, into fields like hers. She explained that she thinks about this when she chooses students to work with, because while she has noticed more gender balance in her field throughout graduate school, she noted an underrepresentation of women of color. She said, "Any activity I do, I try to think 'how I can involve other underrepresented groups?'" Jasmine saw her membership in the scientific world as important not only for the research she does, but also for how it facilitates outreach to others.

Some storylines about women's expertise in science involved situating women's presence and experiences in their fields more broadly. Two commonly used storylines were women's-increased-participation-over-time and science-as-gender-neutral. Multiple interviewees observed that while scientific fields like theirs have long been male dominated, this is changing. Incoming cohorts have larger numbers of women than before. Constance noted:

It seems that there are a lot more females than males typically working on climate change-related projects. . . . For my undergraduate institution that was the case. . . . A lot of the students that were in my atmospheric science department and were really interested and passionate about climate change and making a difference were mostly female. Which is funny when you look at the larger field of atmosphere science, there's such a small pool of females doing it.

Heather, another participant, mentioned, “We’re at a funny time, I think, because it does seem like there’s more women coming up now. And in terms of academia . . . assistant professor positions, things are changing.” However, Heather went on to say, “And yet, most of the, sort of, loudest, most dominant, and most authoritative voices in the room are always still men—in many cases in atmospheric sciences. And the voices around climate change, and even the voices around dissent, and, like, doing something about [climate change].” Her reflections fit a common pattern among the interviewees, who noted that while women are increasingly being recognized for their proficiency in science, there is still quite a way to go before they attain the same level of prestige as their male peers.

Even as they recognized that several scientific fields remain male dominated, nearly all participants who work in these fields strongly believed that science is not a gendered process. This was largely in response to my asking them whether they view climate change as a masculine issue area. I chose to ask this question in order to introduce the concept of masculinity into our conversation, as so many interviewees focused almost exclusively on women in their responses. Scholars such as Sherilyn MacGregor claim that climate change in particular “has brought about a *masculinization* of environmentalism. Men dominate the issue at all levels, as scientific and economic experts, entrepreneurs, policy makers and spokespeople” (2009, 127–129). Additionally, she maintains that understandings of climate change and the accepted solutions to it are gendered in that “climate change has been presented not only as a largely scientific problem (one might say it has been *scientized*), but also as a threat to national and international security (i.e., it has been *securitized*).” She, along with many other feminist scholars, argues that science and security are “stereotypically masculinist discourses.” This means that they are areas that have been dominated by particular ways of thinking that are associated with masculinity (Fox Keller 1995; Harding 1991, 1993). While they have also tended to be male dominated, it is more their general orientation and prevailing discourses that makes them masculinist.

While it is important to note that they were not reacting directly to MacGregor’s full argument, some participants were quite unsympathetic to the idea that climate science could be conceptualized as masculine. Although

multiple participants were receptive to the idea of reflecting on climate change as a masculine issue area, others thought it was “rubbish,” “annoying,” and “really rankles” them. April, a nonprofit worker, claimed that there are many women in Germany with the “same knowledge, expertise, experience, level of vocabulary and so on [as men].” For her, this meant that women are present and proficient in science. Likewise, Kate, a nonprofit worker in the United States, argued quite strongly that

I’ve never felt science can be a masculine endeavor. And I think I can credit my father for that—because he is a scientist, and he always taught my sister and I both to handle things in a logical and analytical way. And I think it sounds like a gender cop-out to make it feel like it’s a mutually exclusive issue. Like science versus ladies. Do you know what I mean? . . . Who knew I’d feel so strongly about that?

Kate’s idea of science entailed the use of logic and analytical thinking in dealing with a given problem. She focused on a process rather than a field with messy boundaries and unequal distributions of power, including power among members but also power between humans and the natural world. This later picture is closer to what feminist scholars such as MacGregor describe. Kate’s portrayal of science fits the science-as-gender-neutral storyline that understands the distribution of men and women in science as problematic, but not science itself. Feminist scholars have published a great deal on the links between gender, science, and technology. The contributions of feminist scholars to the philosophy of science have been immensely important for shedding light on how notions of masculinity and femininity infuse scientific study and practice (Fox Keller 1995; Harding 1991, 1993). This literature calls for recognizing that both gender and science are socially constructed categories. Yet the former is more often recognized than the latter as a constructed notion. According to Evelyn Fox Keller (1995, 4), “Science is the name we give to a set of practices and a body of knowledge delineated by a community, not simply defined by the exigencies of logical proof and experimental verification.” She goes on to explain that “women, men, and science are created, together, out of a complex dynamic of interwoven cognitive, emotional, and social forces.” Understandings of the boundaries

of science, including what counts as science and who counts as a scientist, are not law. They emerge from a set of social negotiations that are often invisible and always in flux. The science-as-gender-neutral storyline is largely incompatible with this view of science. Those participants who used the storyline typically did not have a great deal of background in thinking about gender in their work. This is one of the reasons that understanding discourses is so important: it can potentially offer tools for how to reflect on gender in ways that some people working in climate change have rarely been expected to.

Knowledge Provider

While the scholars I spoke to identified themselves as having expertise in their particular fields, women's proficiency in academia is not always recognized at the same levels as men's. In my field of political science, for instance, research illustrates that women are consistently cited less than their male peers, even when accounting for other significant predictors of the difference (Maliniak, Powers, and Walter 2013; Mitchell, Lange, and Brus 2013).²⁰ There are organizations whose goal is to shift assumptions about where scholarly expertise comes from, such as the Women Also Know Stuff database in Political Science, which sets out "to promote and publicize the work and expertise of scholars in political science who identify as women." They explain that "implicit and explicit gender biases mean that women are often underrepresented as experts in the academy and in media" (Women Also Know Stuff 2019). The fact that people felt this database was necessary speaks to the enduring challenge that women face in the quest to be seen as knowledgeable. It would be unfathomable to have a "Men Know Stuff" database because that is already assumed.

Likewise, the group 500 Women Scientists was founded by a small group of women right after the 2016 US presidential election through an open letter stating a "commitment to speak up for science and for women, minorities, immigrants, people with disabilities, and LGBTQIA." They have since grown into a grassroots organization with over twenty thousand women from natural science and math fields and supporters from more than one hundred countries signing up in support of the organization. Their current mission is to "serve society by making science open, inclusive, and accessible" (500 Women Scientists 2019).

Both of these organizations serve to highlight women's expertise in the social sciences and sciences. In both cases, the motivation behind them is to show other communities what my interview participants already think—women know stuff. They particularly know stuff about climate change.

While interviewees largely referred to other women as “climate change leaders” in the realm of negotiations or diplomacy, they highlighted their own expertise in their role as researchers, consultants, or teachers. They work on many topics that relate to climate change within various disciplines. For these participants, climate change knowledge is acquired and passed on through multiple sources, especially through education, research, graduate mentoring, and teaching. At the beginning of each interview, I asked participants some basic information about how long they have worked on climate change and what kinds of tasks they perform in this area. This is often where interviewees indicated their own role as experts on some aspect of climate change, ranging from climate change ethics, to climate change governance, to the role of clouds in the climate system, to climate-related migration of trees, and beyond.

Some participants from the academic sector recounted ways that their expertise was recognized and sought out by different actors. For instance, Brooke, a US-based academic, was invited to contribute to a local-level climate change project because of her expertise in climate change governance. Additionally, US-based Candice frequently provides her expertise for a range of actors, including a children's environmental health organization and the US Navy. She has also testified before the US Congress. These examples illustrate that many interviewees not only acknowledge their own expertise but are also regarded as authorities in their field by other actors. In Candice's case, the US Navy, which many might not immediately associate with the climate change realm, asked her to consult with them multiple times based on her research on ice in the climate system, a topic of interest for those concerned about sea level rise and other impacts that have been linked to issues of national security (Center for Naval Analyses 2007).

More than one participant has done work as a “knowledge broker,” or someone who works as an intermediary to translate information from one source into something usable for a different network. In these cases, the women translated climate science for policymakers or members of the

general public. They used a particular skill set of distilling and reframing climate data, a task that requires expertise in both climate change and policymaking or public engagement. Candice argued that the public needs to understand climate change impacts beyond numbers. At the same time, this knowledge broker role might not be validated in academic spaces:

What I do is societally relevant except it has to be translated into something that society needs. They don't particularly need any climate model unless somebody helps them . . . interpret it for what it means to society. And that's where, even though it probably won't win the respect of my peers, as I've always attempted to do, the route that I've been affiliated with anyway. . . . And so, I feel like I can contribute something unique and probably critical to success. I'd like to do that.

Candice saw her contribution as unique and essential for successfully engaging the public about climate change. She viewed herself as capable of providing this function, even though she felt she is not rewarded for this kind of activity in her career.

This knowledge broker role was also played in a less formal way. Constance, for example, started a “climate change communication” group with another student at her undergraduate institution in the United States to present climate science to middle and high school students. She wanted to present the science to them in an “unbiased way,” giving them “just the facts.” Other interviewees in the nonprofit sector told me that their goal is to arm people with knowledge about climate change so that they can make informed decisions as consumers or citizens. Others interact with policymakers through lobbying efforts. What is important to note here is that these women viewed themselves and their organization as possessing the climate change knowledge that they transferred to other actors.

In teaching and mentoring students, scholars convey climate change information as part of their routine duties. Sarah is a physical oceanographer who heads an interdisciplinary program on climate change at her university. As part of the program, she helps coordinate a yearly Graduate Climate Conference, which draws eighty students from across the United States. She referred to this as “the thing she is most proud of” in her work with the program and noted that this event “shows that we're creating broader, more intellectually

open scientists.” This knowledge dissemination activity was something that she was particularly excited to share with me. Additionally, Kit, an academic based in the UK, mentioned that she touches on gender and climate change connections in one of her courses that tends to contain large numbers of biology majors. She commented on the fact that students typically come into the course with an awareness of climate change, yet many are surprised by learning how it intersects with gender. The fact that she introduces new students to these issues each time she teaches the course means her expertise is being repeatedly distributed to a new population. In the course of her position as a scholar and teacher, she introduces students to a particular facet of climate change that they might not have learned otherwise.²¹ Interviewees used this storyline of knowledge provider, along with knowledge creator and climate change leader, in ways that identify women as authorities on climate change.

EXPERTISE CALLED INTO QUESTION

However, participants also indicated several instances in which their expertise was challenged or underappreciated. For instance, Linda, who draws on her biology degree for her advocacy work on children’s health in the United States, found it frustrating when people assumed that she did not have the background to speak authoritatively on the issues she was discussing. She said she feels that she needs to convince the mostly male politicians she interacts with—“cranky men,” in her words—that she understands the science behind the children’s health issues she addresses. She quickly pointed out that she should be treated with respect even without a science background, but that it bothered her when her credentials were not valued or acknowledged and she was treated with a dismissive “Okay, sweetheart.” Constance reflected on the difficulties of not only being a “woman in science,” but a woman who studies a scientific topic that has unfortunately become a political lightning rod. She mentioned that “it feels like you have to prove yourself,” particularly when talking to people outside of scientific circles. For Linda and Constance, their scientific credentials do not necessarily enable them to be taken seriously when they discuss climate change with people who lack the same background. In Linda’s case, she saw herself trying to overcome

the same gendered trope of uninformed housewife used to belittle environmental activists such as Lois Gibbs and others (Blum 2008; Seager 1996).

Allison similarly noted a tendency for people to call her academic expertise into question:

I do actually see, like I literally have seen the faces of people who have read my book—when they find out who I am, and that I’m female, and that I look the way I do. I look younger than I am, too. You can see that they’re like, really? You’re the author? And then the people who haven’t read my work, and don’t know who I am, they can be really difficult to sort of get past what their preconceived notions of what an expert looks like and I get like a lot of mansplaining still. My chiropractor was mansplaining to me about climate change adaptation the other day. I was like, dude. Seriously? I teach entire courses about this.

Allison was by no means the only participant to recount this kind of exchange or pattern of behavior. Janice, for example, had been working on a clean energy initiative for her US-based climate change organization for over five years when her male colleague, who was the originator of the initiative, left the organization. She was introduced to everyone on the team as the new leader on the project, and she did significant outreach with those involved on where everything stood. She indicated her extensive knowledge and work on the project to me. “I wrote the proposal for the work to be funded,” she said. “I delivered the presentation to the legislature, and the academicians for part of this biofuels working group, and I wrote the follow up email.” Despite all this, one of the men in the initiative sent an email to her male colleague asking questions about the work instead of her. “I often feel like I am invisible here” was her reaction. When I asked a follow-up question about who she is invisible to, she responded, “It’s with men, women do not see me as invisible. Women see me as a leader with the movement.”

Aida, an academic in the United States, did not claim to have experienced rejection of her specific expertise as a climate scientist, but her first reaction to the phrase “gender and climate change” was to wonder about gendered expectations of expertise by saying “people are more, maybe, trained to recognize a male expert.”²² These examples of women feeling like their expertise was not recognized or that the knowledge and contribution of other

women were not recognized exhibit the women-as-knowledgeable discourse. Interviewees thought that there was specific expertise possessed by women that was being ignored, downplayed, or belittled in gendered patterns.

Women's scientific knowledge about environmental topics is related to gendered societal trends in science, technology, engineering, and math (STEM) fields. Existing research indicates that while there are no gendered differences in early quantitative and mathematical ability (Kersey et al. 2018; Kersey, Csumitta, and Cantlon 2019), there are gendered differences in science and math education, which foster gender imbalance in STEM fields (Jacobs and Simpkins 2006; VanLeuvan 2004). Girls tend to express less interest in science and math, have less confidence in their science and math abilities, and have lower expectations for success in these courses than do boys, largely independent of their actual performance in their science and math education. This is largely because the way they are introduced to these subjects reinforces gendered assumptions about which topics are appropriate for boys and which for girls (McCright 2010). At the same time, women and men tend to express different perceptions of science in the general public, with women often expressing less confidence in science overall (Fox and Firebaugh 1992).

One interviewee, Sharon, mentioned the impact of how people are educated into STEM fields:

I've heard people . . . higher ups at organizations that are pro-clean energy, pro-climate change [action] talk about the difficulty of talking about solar as a technical issue to women who aren't as "technically minded." And those kinds of comments. And even the science you know, "There's so much science in climate change and do women really understand it because stereotypically women are not as science oriented." [Prompt: do you agree with that?] No, I think that's a product of the education system. I don't think that's because our brains are pitiful. [Laughs] We can see the push to try to get more girls into science, but this hasn't always been the case. I think [the lack of women in scientific fields] is just a product of the way society runs education and life in general.

Sharon's response speaks to why there may be more men than women in certain climate-related fields, as well as to the prevalence of the perception of women as not "scientifically minded" is across multiple sectors. She rejected

this assumption by emphasizing that the problem lies with how people are educated and not with who is “scientifically minded” or not.

Seventeen interviewees mentioned that women are underrepresented in science or that they are less visible or recognized in their scientific fields. Participants observed that women have a great deal of climate change knowledge, but that their STEM fields present some challenges to having this knowledge showcased and utilized.²³ Lydia, a nonprofit worker in the United States, for instance, brought up organizing a workshop focused on women in STEM. She found that “one of the surprising things that came out of that workshop is that the women we were speaking to, who were mostly young women, we asked them what they think of a scientist and what is it that they picture. Most of them were thinking male, white lab coat . . . so nothing indicating women.” For her, this indicates the need to interrogate perceptions of expertise in climate change. She went on to say that while it is essential to establish scientific consensus about the nature and effects of climate change, when a strong connection is made between climate change and science, there might be gendered impacts to assessment of where expertise lies. This is “because there’s something psychologically going on that women don’t innately see strong female presences in the sciences.” Phillis, a climate scientist working in the UK, related this particularly to the egos of some male climate scientists:

I’ve experienced a lot of scientific egos in the field as well. . . . It’s the personalities, isn’t it? It’s like “Oh, we’re a world leader in this, and we have to do these roles that are more than most scientists.” . . . I’m thinking about four or five characters that I know who think, you know, “We’re the most important people in the department.”

Such individuals preserve their privileged positions at the expense of others and are often able to play this gatekeeping role because of gendered expectations about expertise.

Other participants added that this expectation about who speaks in science influences how they are personally viewed as scientists. Brittany has a degree in environmental science and works for an environmental nonprofit in the UK. Noting that her studies in science were male dominated, including

the make-up of her peer groups, she said, “If I’m talking amongst my peers, I’ve got the same degree. . . . I’ve got the same grades. I will get less of a space to talk than the rest of them,” meaning men in her position. Constance, an atmospheric scientist in the United States, similarly said that she feels underestimated: In her words, “the biggest challenge for me both personally and professionally is just not being taken seriously as a scientist. And this goes in regard to being a woman in science and also being a woman studying climate change—which is a highly debated topic these days. So, it feels like you have to prove yourself.” Jasmine brought up both gender and race in her responses.

As a woman—not only a woman but as a woman of color—I can’t ignore that intersectionality when I speak about this. Fortunately, I’ve seen over the years, I’ve seen at least in academia the graduate student population at my school in environmental science [has] been pretty good. It’s like 50–50. In some cases, some cohorts come in with more women than men, which is fascinating. Unfortunately, on the other end there are not really many women of color. I’m the only black woman in my cohort in the graduate sciences and environmental sciences. And it’s unfortunate that the diversity isn’t there in regard to that. Because there so many different perspectives we could bring to the conversation. When we see the transition from graduate students to faculty . . . that’s when we see the number [decline], especially tenured professors working in science, especially climate science. I could probably count a handful of women who have a seat at the table, so to speak, in regard to their weight in contributing to climate change discussion.

These comments highlight the importance of different perspectives being part of climate change conversations as well as the specific problem of women’s absence. In Jasmine’s view, the fact that women of color in particular are underrepresented in her field means that useful perspectives “that other groups, specifically white men, won’t even think about” are lacking. She also noted that “in the natural sciences we’re not primed to think about how gender fits in with climate change. In these hard sciences we’re taught the technical aspects of it. We talk about, perhaps policy, but not in that angle.” This point was echoed by Lydia, who works for a solar energy organization in the United States. She left the natural sciences because she wanted a more community-focused view of environmental change:

Initially my focus was on extreme weather, specifically with hurricanes, and I was working on hurricane modeling . . . at [an atmospheric research center]. . . . Then there was this one day that I was just modeling a huge storm in the future that was wiping out the Caribbean islands and I just . . . I don't know. Something just clicked and I wanted to make a big switch from being the scientist that was in the room modeling things to actually being on the ground and seeing things from a community perspective. And thinking about how is it that this future storm that I'm modeling, how is that actually affecting people in communities, on a more societal level. So, I got more interested in the societal aspect of things. It wasn't anything that I had an actual academic background on so I kind of took that on for myself for my Masters and decided to do a more interdisciplinary route and combine my love of weather and environmental issues and try to see how that can be fused with societal issues.

Like Jasmine, Lydia suggested that there is something about the natural sciences themselves that shapes views of climate change. Of course, this happens in other fields, but the point these participants were making was that their disciplinary lenses did not readily incorporate social aspects of climate change, including how it intersects with gender. They both regarded this as unfortunate.

Interviewees also highlighted a few major obstacles facing women in STEM fields when they try to balance work and family obligations. This illustrates connections between the women-as-knowledgeable and women-as-caregivers discourses. Jasmine brought up that women might be under-represented in STEM because “being a woman who wants a family but also wants to conduct science—especially climate science or environmental science where you often go into the field for long period of time or away from your home for long periods of time—that’s a challenge.” Likewise, some participants discussed their dual roles as both scientists and mothers during our conversations. Like Jasmine, they mentioned the difficulties of balancing a demanding job with recovery after childbirth, care duties for sick children, and other facets of motherhood.

These concerns and experiences appear to be relatively widespread. In fact, a 2019 study found that parents are more likely to leave STEM jobs

than their childless peers (Cech and Blair-Loy 2019). According to the same study, 43 percent of first-time mothers end up leaving their full-time position in STEM fields after the birth of their child, while 23 percent of new fathers end up leaving their position. And these findings hold irrespective of variation by discipline, race, and other demographic factors. The study attributes some of this to the fact that many scientific fields are felt to be uncondusive to the realities of parenting. Given that women still do a disproportionate share of care work in many countries, it is perhaps unsurprising that they end up leaving science and math positions at greater rates than men after becoming parents. Women associated with the 500 Women Scientists group wrote a 2019 blog post about breastfeeding challenges in science, which raises some similar points. According to the authors, there is a lack of institutional support and cultural acceptance of breastfeeding in academic settings, which leads to workplace protections for breastfeeding not being honored. They singled out the natural sciences, saying that “there are many unique consequences of being in scientific fields that make it difficult to breastfeed, including: remote field sites, open laboratory spaces, working with potentially hazardous materials, unpredictable hours for experiments, teaching obligations, and many more” (McCullagh et al. 2019). Unless some of these obstacles are addressed, women may continue to be underrepresented in these fields.

Other participants noted that while they sometimes struggle with being seen as experts in science, they also must confront a lack of public support for climate change science in general or a public failure to value the expertise of the scientific community. For Constance, an atmospheric scientist in the United States, “the political attention around [climate science] has really made it challenging to get up and go around to campus and doing my research. It’s almost like why bother with this research when I live in a country that doesn’t believe the science?” Reflecting on the women-as-knowledgeable discourse requires thinking through not only when and how women’s climate change expertise is identified, but also how this proficiency is viewed inside and outside of climate change spaces. Who is recognized as possessing climate change knowledge and what does this position afford them?

IMPLICATIONS OF THE WOMEN-AS-KNOWLEDGEABLE DISCOURSE

Within the women-as-knowledgeable discourse, climate change is both a facet of our world and a site of disagreement within society (i.e., skeptics or those who understand the facts). Climate change is also an academic or research specialty. People go to conferences on climate change, belong to academic networks on climate change, teach classes on climate change, and publish research on climate change. Finally, climate change is a policy problem that requires information as well as diplomacy to address. Climate change experts are needed to help get to effective solutions.

Where are the women? They are in climate change negotiations and policy meetings. They are in science labs, classrooms, and conferences. They are in spaces that have often been dominated by men. Participants stressed that women make valuable contributions to climate change knowledge, even though they occasionally feel that these contributions lack sufficient recognition. At the same time, the women-as-knowledgeable discourse also portrayed women in spaces that are in line with dominant gender norms—for example, in fields planting crops and in forests gathering resources. In these depictions, women gained important environmental knowledge because of their role as laborers or through domestic care work.

The overwhelmingly positive storylines associated with the women-as-knowledgeable discourse indicate a level of pride in women's contributions to climate change understanding and action. In many cases, participants used the discourse when mentioning their own climate change knowledge and activities. They outlined their projects and tasks, speaking engagements, research topics, classes taught, among other activities. They also used the discourse to refer to women more generally who have a high profile in climate spaces, largely within either diplomatic or scientific circles. Christiana Figueres in particular represents a visible example of a woman who is acknowledged as a climate change expert, by both interviewees as well as many people across the world. Although she is from the global South, she is typically discussed in terms that highlight her agency. Figueres's comes from a family of political figures from Costa Rica, with her father and brother both serving as the country's president, and her mother serving as a member of the legislative

assembly as well as an ambassador to Israel. She was educated at institutions in the global North and fails to fit the profile of the rural resource user that is typically used to refer to women from the global South. Overall, women from the global South were depicted as knowledgeable because they perform specific tasks that afford them knowledge. When participants gave examples of women who are knowledgeable, it was because they are scientists, or knowledge brokers, or diplomats, and these much more often came from the global North. When we ask, “Who are the women?” there is a noticeable dividing line between the knowledgeable women of the North and South. While there were exceptions to this trend, such as participants mentioning individuals from the global South they had worked with or seen present at a conference or event, the larger trend is one of expertise, at least traditional notions of expertise, being in the North.

There is a fine line feminist scholarship typically walks in situations like these between avoiding essentialization on the one hand and identifying patterns of behavior on the other. While it is crucial that scholars and practitioners adopt a broad understanding of knowledge and expertise that incorporates local knowledge gained from gendered household tasks or resource use, it is also problematic to assume that women of the global South are knowledgeable about climate change predominantly or only because they perform these roles. One problematic effect is their knowledge can be exploited without them being incorporated as full partners in climate action (i.e., their “epistemic objectification”) (Dey, Singh, and Gupta 2018; Dove 2006; Federici 2009; Sapiro 2009; Tuvel 2015). Another is that it renders invisible all of the female scientists, scholars, and politicians from the global South who doubly fail to fit dominant assumptions about where expertise lies. In this way, the women-as-knowledgeable discourse could serve as a frame to counter the frequently simplistic portrayals of women as victims of climate change, but only if it is used to demonstrate the many forms of climate-relevant knowledge that exist.

According to interviewees, women’s climate knowledge takes many forms. For some, being knowledgeable means realizing the scope and scale of climate change and being willing to act. For others, it means producing and sharing data about climate change with peers, policymakers, and the

public. The women-as-knowledgeable discourse features storylines that highlight women as being less susceptible to climate skepticism and as contributing to global climate change research. It is a discourse marked by positive depictions of women and their qualifications to speak with authority about climate change. As such, it presents opportunities as well as obstacles to framing climate change in ways that are beneficial to the goals of sustainability and justice.

One opportunity afforded by the discourse is its broad conceptualization of knowledge. The discourse encompasses both a status quo orientation toward knowledge as well as a transformational direction. On one hand, the discourse is often associated with scientific, scholarly, or professional forms of proficiency. Participants mentioned specialized knowledge or savvy, as well as expertise indicated by credentials and title. These include chief climate scientist, head negotiator, and PhD. In this way, the discourse potentially reinforces existing ways of framing and understanding climate change. One facet of the discourse asserts that women can achieve proficiency in fields such as science, academia more broadly, and politics, all of which have historically been male-dominant. This defiant function of the discourse suggests that women need to have their contributions recognized. It does not necessarily challenge the knowledge itself or the practices through which it is gained and disseminated. It does not assess how some perspectives are regarded as “expertise” and others are not. For instance, those who reacted negatively to the idea of climate science being masculine tended to object to the notion that some might regard women as unable or unfit to participate in science. They suggested that women’s knowledge and participation undercut any portrayal of these being masculine spaces. For many, their first response was to support the institution, even if they then pointed out gender imbalance in power relations or other areas. In this vein, presenting women as knowledgeable about climate science or climate politics paints them as useful to mainstream climate action as they produce knowledge and perform functions that are necessary to climate understanding and policy.

On the other hand, the women-as-knowledgeable discourse also considers women’s climate knowledge as unique and potentially transformational. A few interviewees noted the “powerful” role that women play when they educate their families and communities about climate change. This task will

not likely be put into a resume or be evaluated for tenure and promotion, but it still represents a form of knowledge dissemination in its own right. At the same time, while some participants identified men as being more heavily involved in technological approaches to addressing climate change, they often followed up by noting that women frequently possess the capacity to get people to care about climate change on a personal level. Interviewees mentioned that approaching climate change as a matter of rethinking the human-nature relationship—as opposed to a technical matter—is stereotypically feminine.

For example, Molly is a US-based academic who contrasted “masculine” technological approaches with a social justice frame. One reason she argued the latter is less prominent is that it is more difficult to incorporate into policymaking. “When we frame climate change as a justice issue or as an economic issue then we are getting into much more, much broader frames . . . and it becomes a, you know, even more systemic kind of way of thinking about it.” For Molly, the fact that humanity is tackling climate change through existing structures influences how we think about it. Furthermore, it shapes assumptions about knowledge and expertise. If climate change is approached in a narrow fashion, then this simultaneously limits whose expertise will be consulted. Even when women’s expertise or skills are not acknowledged, it does not mean they are not there. They simply may be less visible or less valued. When Candice argued that she is not rewarded for her knowledge broker role by her scientific colleagues, she was pointing out a potential limitation to existing beliefs about what kind of expertise society should value. She indicates that her ability to make climate science relevant and meaningful to the public (i.e., a social role) is also essential. Feminist scholars have likewise called for rethinking climate knowledge and expertise. According to Christina Shaheen Moosa and Nancy Tuana (2014, 678–679), “Our knowledge and ignorance concerning climate change are shaped by relations of power.” Dominant ways of discussing climate change as a scientific or economic issue typically frame climate change knowledge as objective and value-free. Despite these representations, “the methodologies and rhetorics of climate science, like all sciences, are far from value-free. The solution, of course, is not to remove values from science, but to render

them transparent and subject them to careful analysis.” Likewise, feminist economists such as Julie Nelson (2007) claim that economic frames of climate change tend to overlook those who are most vulnerable to climate change as well as future others. This scholarship challenges the idea that scholars and practitioners should add more women or highlight women’s contributions to existing ways of knowing climate change and instead critically engage with those ways of knowing.

These points about critical evaluations of knowledge relates to interviewees reflecting on proficiency more broadly. In some cases, expertise was depicted as a necessary qualification for entry into a group, space, or circle of conversations. Jasmine justified her decision to become a scientist “to show my expertise in it, so the weight of what I say is valued.” This indicated her assumption, shared by many others, that her perspective will be less respected if she lacks a specific set of credentials. The value of her expertise is evaluated externally. Other participants reflected on internal evaluations of their skill or proficiency. For instance, Alice has had experience as a practitioner with the Scottish government as well as with an organization that provides research and analysis to the government on climate change for policy purposes. She has been in her position for about two and a half years and explained that she has had an interest in climate change for fifteen to twenty years. Despite all this, she claimed that

My personal challenge is that I always feel that I need to know more before I can do things properly. And I never know enough partly because I can be dealing with [one issue] in the morning and in the afternoon go on to [a very different issue]. I just never know enough. I don’t know what that says about gender but that’s my personal challenge.

In Alice’s case, she perceived her own expertise to be insufficient because she is responsible for knowing something about a diverse range of topics related to climate change. This reflection points to the complexity of climate change and the enormity of the number of topics it intersects with. Being expected to know “enough” about even a single facet of climate change can be very daunting.

So, where does expertise come from? How are we trained or socialized to think about knowledge and who possesses it? A 2016 study of youth climate activists in Canada by Joe Curnow and Jody R. Chan (2016) argues that gender plays a central role in how expertise is perceived in activist spaces, with men who behaved in “typically masculine ways” being more likely to have their positions praised and reinforced and being recognized as a leader or expert. They claim that “becoming an expert in a community of practice may have less to do with adopting shared practices or acquiring new skills, and more to do with performing masculinity, even in spaces that value social justice and anti-oppression” (Curnow and Chan 2016, 146). In other words, just as gender influences perceptions of knowledge among older generations, similar patterns may be at play in the vibrant youth climate change movements across the globe.

Asking about where expertise comes from is obviously relevant for thinking through expertise about climate change, but it also speaks to patterns I found of interviewees worrying about their capacity to answer my specific questions. There were multiple instances of participants stating that they were not experts on gender and climate change. They told me that their responses were “just their opinions,” that “they had not done any research on this,” or their “understanding of that is very, very limited at this point.” Some apologized for their answers,²⁴ saying “sorry” for not being able to recall specific pieces of information, or for going off on tangents or “waffling,” despite the fact that they were just answering the questions that I asked.²⁵

Several interviewees also seemed hesitant to make strong claims because they felt that they did not have the background or credentials to back up their claims. I even had one participant tell me that there were other women in her nonprofit organization who were interested in my project and would have liked to participate, but that they did not feel comfortable doing so because they did not have a background in topics like gender and climate change. While those scholars who have given us decades of important gender and environment scholarship obviously have a great deal to tell us about gender and climate change, I argue that my participants working on climate change issues also have some important insight. It would not do to replace

one form of knowledge with another, but the data from the interviews allow us to understand how a range of people who identify as women make sense of these connections based on their work and everyday experiences. It is unfortunate that others were turned off from participating because they negatively evaluated their own ability to make a contribution to my project. I wonder what the larger implications of these negative evaluations of expertise might be for other areas of climate action. Is the behavior of these interviewees just part of a larger pattern of women feeling uncomfortable stepping out of an area in which they have specific credentials or expertise? Do scholars and practitioners limit themselves if we assess expertise so strictly?

These questions are particularly relevant when considering the close association between climate change and scientific knowledge, as argued by multiple participants as well as scholars. According to Karin Bäckstrand (2004, 695), “Environmental politics is increasingly scientised and technocratic. The scientisation of environmental politics implies that political and social issues are better resolved by technical expert systems than democratic deliberation.” If our understanding of a climate change expert is of a “scientist,” then there are important gendered ramifications of this, not to mention raced, classed, and placed implications (Bäckstrand 2003, 2004; Israel and Sachs 2012; Moosa and Tuana 2014; Nagel 2016; Tuana 2013). For instance, interviewees noted that institutions such as the Intergovernmental Panel on Climate Change (IPCC) are male dominated. They mentioned the IPCC specifically as an entity that has a high degree of prestige in climate change discussions, but one that has a significant gender imbalance.²⁶ A 2018 study of gender and the IPCC found that women not only confront challenges based on gender, but that they also “face multiple and diverse barriers associated with social identifiers such as race, nationality, command of English, and disciplinary affiliation” (Gay-Antaki and Liverman 2018, 2060). A study by Miriam Gay-Antaki and Diana Liverman draws on survey data from women who have participated in authoring IPCC reports and thus shines light on first-hand accounts of obstacles some women encounter in having their expertise valued. It finds that certain categories of women struggle particularly hard to feel heard, including women with young children, women of color, and women from the global South. Taking gender

seriously in discussions of climate change entails interrogating where current systems might perpetuate marginalization. For some women, this includes high-profile institutions such as the IPCC (Yeo 2018).²⁷ The IPCC is an example of an organization that is globally recognized for its contributions to climate change understanding and has taken steps to address inclusivity and diversity. However, it is also an organization that has faced criticisms for replicating existing patterns of sourcing knowledge, thus also replicating gendered, raced, and classed patterns of power in climate spaces (Nhamo and Nhamo 2017).

None of this is to deny the value of the crucial work done by climate scientists, but rather to think through ways in which gender plays a role in legitimizing some voices more than others. Some climate scientists have reported intense gendered or sexualized harassment when their research gets picked up by mainstream media or climate skeptic outlets. While most of the harassment takes the form of social media posts, emails, and phone calls, some worry for their physical safety (Johnson, Widnall, and Benya 2018; Ogburn 2014; Waldman and Heikkinen 2018). Although none of my participants described these extreme levels of harassment, they did remark on belittling YouTube comments on their lectures and other disparaging behavior.

The “masculinization of environmentalism” that Sherilyn MacGregor (2009) critiques results in male-dominated scientific fields mostly closely associated with climate change expertise. The ramifications of this might be gendered harassment of female scientists who fail to fit the dominant profile of one who has scientific expertise. This notion of climate expertise can reinforce existing models of knowing and acting without leaving room to reflect on possible transformations that could render climate action more effective and just. This is just what interviewees suggested when they highlighted the transformative potential of women’s climate change knowledge. None of the participants who used the transformational storylines suggested that climate science was not valuable. Rather, they stressed that failing to connect climate science with climate change impacts in people’s daily lives would leave climate action either ineffective, unjust, or both.

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Examining Discourses from the Global North

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