6

Scientists as (Not) Knowing Subjects: Unpacking Standpoint Theory and Epistemological Ignorance from a Psychological Perspective

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Positioning Psychology in Relation to Feminist Science and Technology Studies

Within the broad and diverse field of Science and Technology Studies (STS), feminist STS applies the insights of feminist theory and epistemology to the study of science and technology (see Creager, Lunbeck, & Schiebinger, 2001; Mayberry, Subramaniam, & Weasel, 2001).

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K. C. O'Doherty et al. (eds.), *Psychological Studies of Science and Technology*, Palgrave Studies in the Theory and History of Psychology,
https://doi.org/10.1007/978-3-030-25308-0_6

Work within feminist STS has elucidated the relationships between gender and science, arguing not only that science is a social activity imbued with gender dynamics (inequities, sexism, androcentrism, cultures of masculinity, etc.), but that scientific models, theories, and knowledge are deeply imbued with gender (Haraway, 1989; Keller, 1985; Martin, 1991; Merchant, 1980; Schiebinger, 1993). Feminist studies of technology have demonstrated how the association of technology with masculinity has discouraged women from entering fields such as computer science and engineering. More recently feminist technoscience scholars have focused on the mutual shaping of gender and technology, regarding neither technology nor gender as immutable but rather co-constitutive (see Wajcman, 2007).

The relation between psychology and feminist STS has so far primarily been restricted to critique, that is, feminist STS scholars have subjected psychology to feminist and gender analysis. For example, Haraway's classic work *Primate Visions* explored the gendered and heteronormative dynamics and scientific/engineering vision of psychologist Robert Yerkes's Yale Laboratories of Primate Biology. Haraway also examined the monkey "mother-love" research of Harry Harlow at the University of Wisconsin-Madison to demonstrate how Harlow could "design and build experimental apparatus and model the bodies and minds of monkeys to tell the major stories of his culture and his historical moment" (Haraway, 1989, p. 231). Primatology and sociobiology, interdisciplinary fields that include psychology, have been fruitful objects of study for feminist STS scholars (see also Hrdy, 1981, 1999; Ruck, 2016).

There is also a small but growing body of work by historians of psychology that demonstrates how psychological theories, research designs, and the boundaries of scientific psychology have drawn on, maintained, and perpetuated gender stereotypes (e.g., Hegarty, 2013; Morawski, 1985; Nicholson, 2001, 2011; Rutherford, 2015; Shields, 2007). There are furthermore examples of theories/concepts from STS being applied to understand how women's experiences, such as date/acquaintance rape (Rutherford, 2017), post-partum depression (Held & Rutherford, 2012), and menstrual synchrony (Pettit & Vigor, 2015), have been realized and circulate through scientific and popular discourse.

However, psychology has rarely been used to advance empirical and theoretical research in STS despite the fact that a few of the earliest

contributions to feminist science studies drew on psychological theories and concepts to understand how the dominant objectivist conceptualization of science is linked to masculinity. Notably, Evelyn Fox Keller—referencing the work of Nancy Chodorow, Dorothy Dinnerstein, and Jessica Benjamin—used feminist object relations theory to posit that intrapsychic developmental processes combined with cultural influences led to the association of masculinity with separation, autonomy, objectivity, and domination, while femininity became associated with subjectivity and interdependence. Inasmuch as the goals of positivist science include objectivity (which involves separation of subject from object) and the domination of nature, these must be regarded as a projection of masculinity onto science. As she wrote in the early 1980s, "I suggest that the impulse towards domination does find expression in the goals (and even in the theories and practices) of modern science, and argue that where it finds such expression the impulse needs to be acknowledged as projection" (Keller, 1982, p. 598; see also Keller, 1978). Despite Keller's work, the cross-fertilization between psychological theory and feminist STS has not been nearly as extensive as that between feminist STS and philosophy, history, sociology, and anthropology. As mentioned in the introduction to this volume (insert reference when it becomes available), this may be because of psychology's overreliance on positivist approaches to knowledge production in contrast to the historical, critical, constructionist, qualitative, and theoretical approaches embraced by the other disciplines upon which feminist STS draws.

In tandem with feminist critiques of science that unfolded over the 1970s and 1980s, psychologists themselves developed approaches to science that drew on developments in the sociology of knowledge (e.g., Sherif, 1979; Unger, 1983). This strand of critique resulted in a branch of feminist psychology that draws on constructionist, critical, historical, and qualitative approaches. This branch has had uneven uptake internationally, with strongholds in Canada, the UK, Australia, and New Zealand, but with comparatively less uptake in the United States where feminist empiricism and the focus on sex/gender differences has driven psychologists' research agendas (for an overview of international developments, see Rutherford, Capdevila, Undurti, & Palmary, 2011). Within this feminist empiricist framework, there has been a small body of work that examines how cognitive processes such as implicit and

ingroup bias interact with scientists' own gender in influencing research results and interpretations (e.g., Eagly, 2012). And of course there is a large body of psychological research exploring the factors related to women's continued underrepresentation in STEM fields. However, as Kumar (2012) notes, while psychological perspectives have much to offer the study of gender-science and gender-technology relationships, psychology is largely absent from STS.

It is within this context that we place our present chapter. Here, we take up the question not of how individual cognitive processes are brought to bear on gender theory or scientific research on gender, but rather of how several existing concepts that are central to feminist STS—such as standpoint theory/epistemology, epistemologies of ignorance, reflexivity, and intersectionality—might be further developed if psychological processes were considered and applied to understanding the subjectivities of scientists. For example, in the case of standpoint theory/epistemology, how does a scientist's social location translate into knowledge or lack thereof? As Harding has repeatedly emphasized, standpoint theory encourages consideration of the relationship between experience and knowledge as mediated through one's set of social locations (Harding, 1993). A standpoint is not a given, it is acquired through struggle. Conversely, the absence of knowledge among the dominant group that standpoint theory seeks to challenge also arises from specific social locations and experiences and is an active, rather than a passive process. How does this happen? And what does this mean for knowledge production in science, and by scientists?

Theories of Not Knowing: Feminist Standpoint Theories and Epistemological Ignorance

Feminist standpoint theories and, subsequently, critical race and feminist reflections on epistemological ignorance, offer psychologically relevant insights into blind spots in knowledge and knowledge production. Feminist standpoint theories emerged not least from feminist consciousness-raising groups of the late 1960s and 1970s in which women (re) claimed epistemic authority over their lives (Mendel, 2009). Noting

that standpoint theories also evolved in ethnicity-based, queer, and anti-imperial social justice movements, feminist philosopher Sandra Harding describes standpoint theory as an "organic epistemology, methodology, philosophy of science, and social theory that can arise whenever oppressed people gain public voice" (Harding, 2004, p. 3).

According to Ian Parker, standpoint theory "reverses and transforms" what a "crass conspiratioral form of Marxism" (p. 722) calls *false consciousness*, i.e., the adopting by the working class of the ruling class' ideological understanding of the world. Standpoint theories insist, however, that false consciousness applies at least as much or *even more* to the ones in power as it does to the dispossessed, for a standpoint not only discloses to us but also conceals the world from us. Indeed, standpoint theories allow for the argument that the position of those in power provides only a limited and distorted perspective of social reality while the standpoint of subjugated groups offers a more complete and less distorted view. Harding calls this the exercise of "strong objectivity" (Harding, 1993), and stipulates that it is actually *strong reflexivity* that is required in order to maximize this kind of objectivity: "Strong objectivity requires that the subject of knowledge be placed on the same critical, causal plane as the objects of knowledge. Thus, strong objectivity requires what we can think of as 'strong reflexivity'" (p. 69). That is, knowledge producers (i.e., scientists, too) must actively work to become aware of how their social location impedes their ability to perceive aspects of social reality that are accessible to others.

A standpoint is related to the social position of the knower (e.g., the social position as "woman" or as "scientist") but it is not identical with it (see also Rutherford, Sheese, & Ruck, 2015). It mediates between social position and knowledge not least by way of experience. Gender, for example, is a relevant analytical category for standpoint theorists because in most societies, the lives and daily practices of individuals are arranged differently along gender lines, affording women with experiences and possibilities that differ from men's. The participation of women of color in both dominant and marginalized cultures offers the epistemological advantage of recognizing a multiplicity of standpoints while remaining cognizant of power relations invisible to the dominant group. Patricia Hill Collins calls this double experience the "outsider

within" status of Black women (1986, 14) while Aída Hurtado speaks of a "mestiza (hybrid) consciousness" (2010, 33) that affords Latina women and other women of multiple social worlds with "multiple lenses" (ibid., title).

The concrete advantages and disadvantages of a given epistemic situation or location depend on the kind of knowledge pursued or on the particular epistemic objective in question (Alcoff, 2007). It is thus vital to emphasize that feminist standpoint arguments pertain mostly to knowledge about systems and consequences of oppression the knower is part of. A standpoint is then always a political project and as such it is a goal rather than a given. Oppressed groups begin to struggle for a standpoint when they learn to "turn an oppressive feature of the group's conditions into a source of critical insight about how the dominant society thinks and is structured" (Harding, 2004, p. 7).

This aspect of standpoint theory can be used to explain why in most countries, scientific theories about gender inequities are so strongly anchored in women's movements: In most scientific disciplines, including psychology, women scientists' concrete experiences with oppression and/or discrimination were vital for turning scientists' attention to these very oppressive social mechanisms (see for the relation between feminist psychologies, gender inequities, and feminist activism in different countries Rutherford et al., 2011). In other words, standpoint theories can help to both theorize and advance the scientific contributions by marginalized and/or oppressed social groups.

"Epistemological ignorance," a concept rooted in critical race theory, by contrast, can be drawn upon to understand how and why dominant groups often demonstrate systematic blind spots in their scientific knowledge production. One such blind spot by White American, male historians of psychology was pointed out by pioneer historians of women in psychology Elizabeth Scarborough and Laurel Furumoto (e.g., 1987) when they observed that historians of psychology had erased the contributions of early women psychologists to the discipline from their historiographic accounts. While standpoint theory can help explain why it took women or, more specifically, feminist psychologists to uncover this erasure and to "re-place" women in the history of psychology (see Bohan, 1995), epistemological ignorance may elucidate the

mechanisms of the historiographic erasure itself. A different example here drawn directly from scientific psychology (as opposed to its historiography) is late nineteenth- and early twentieth-century White male Eurocentric psychologists' theories of racial difference (and, for that matter, gender difference). Most of these scientists were unable—because of their privileged position—to see how their theories of racial science simply reflected the power relations already established in society. In a similar vein, writers such as Francis Galton (e.g., 1869) were unable to see how class structures could affect one's ability to achieve eminence. Galton thus concluded that the capacity for eminence was almost exclusively inherited, despite the fact that his eminent families all shared the same environment (Galton, 1869). This stands as a remarkable oversight on his part unless one appreciates how class was invisible to him given his own vaunted class position.

Reflections on "epistemological ignorance" have tried to understand the very ways and processes of not knowing more systematically (e.g., Alcoff, 2007; Mills, 2007; Tuana, 2006, 2008). Charles Mills launched these discussions in the late 1990s when he suggested that White supremacy is based on an epistemological contract which consists of *epistemological ignorance* (Mills, 1997). Shannon Sullivan and Nancy Tuana took Mills' work up from a feminist perspective. Differentiating various ways of not knowing, Tuana suggested the following taxonomy of ignorance: (1) knowing that we do not know, but not caring to know, (2) we do not even know that we do not know, (3) they do not want us to know, (4) willful ignorance, (5) ignorance produced by the construction of epistemically disadvantaged identities, and (6) loving ignorance (Tuana, 2006). As this taxonomy indicates, ignorance is a multifaceted phenomenon that calls for an epistemology in its own right (Alcoff, 2007), or what some have referred to as an "agnotology" (Proctor & Schiebinger, 2008). What is more, Tuana's taxonomy alludes to the fact that epistemological ignorance relates to systems of privilege and oppression as well as to psychological dimensions like cognition, affect, and the unconscious in complex ways.

Beyond classifying various expressions of ignorance, epistemologists have analyzed ignorance as not (only) a lack of insight or knowledge but as an epistemic practice in its own right (Alcoff, 2007).

Mills (1997, p. 18) called epistemological ignorance an "inverted epistemology," a "pattern of localized and global cognitive dysfunctions (which are psychologically and socially functional)," and a "group-based cognitive handicap" (2007, p. 15), which produces "the ironic outcome that whites will in general be unable to understand the world they themselves have made" (p. 18). Furthermore, he argues that the notion of epistemological ignorance is a "straightforward corollary of standpoint theory" for "if one group is privileged, after all, it must be by comparison with another group that is handicapped" (p. 15). While standpoint theories hold that those in positions of power have *less* interest in scrutinizing their own dominance critically, i.e., in seeing systems of dominance and oppression correctly, this change in perspective posits that they have indeed a "*positive* interest in 'seeing the world wrongly'" (Alcoff, 2007, p. 47).

Psychologies of Not Knowing or Ignorance

In line with theories of epistemological ignorance, Parker has emphasized that for those in positions of power, "their partial view of the world corresponds with their own interests and obscures the operations of the very power they benefit from" (Parker, 2015, p. 724). This kind of epistemological ignorance has a *social function* in that it keeps systems of oppression in place (Mills, 1997, 2007). However, Mills alludes to the fact that epistemological ignorance is also *psychologically* functional.

We now exemplify how the epistemological obscuring of power mechanisms may work psychologically by turning to Gabriele Rosenthal's studies on the silence of Nazi perpetrators and their families, which suggest that, in the case of perpetrators or maybe of those in power more generally, ignorance functions as a psychological defense mechanism particularly against feelings of guilt. In interviews conducted with former Nazi perpetrators and their spouses as well as their children and grandchildren during the early 1990s, Rosenthal and her colleagues found family dialogues that veiled and denied the crimes of the parents and, sometimes, the entire parent generation (e.g., Rosenthal, 1998). Attending to the concrete psychological defense

mechanisms in place, Rosenthal (1998) reconstructed three strategies of deflecting responsibility that were present in all three generations of perpetrator families.

A first strategy of deflecting responsibility is *veiling*: In biographical narrations by the grandparent generation, both Nazi victims and actual perpetrators and their deeds are notably absent. These narrative omissions reflect the actual historical stages in which Jews were dehumanized, persecuted, and exterminated between 1933 and 1945, which leads Rosenthal (1998) to conclude that the real dehumanization and extermination of Jews is psychologically mirrored when both the victims and the crimes of the perpetrators are repressed from consciousness. Rosenthal emphasizes that in both children and grandchildren, repressions that occur psychologically in the grandparent generation manifest themselves as knowledge gaps, which are all too often filled with phantasies about the (grand-)parents' roles in national socialist Germany. Some children and grandchildren even imagine that (grand-) fathers, whose involvements in Nazi crimes are documented in archival records but unknown to their families, were active in the resistance against Nazi Germany (Welzer, Moller, & Tschuggnall, 2002). A second means to avoid responsibility is *victim blaming* or, more generally, a reversal between victims and perpetrators. In secondary antisemitism, for example, Jews or the Allied Forces are blamed for the Holocaust and there is considerable aggression against those who insist on remembering the Holocaust. A third strategy to deflect responsibility is *pseudo-identification with the victims*. Rosenberg cites examples of ostensible philo-Semitism in children of Nazi perpetrators as a strategy of veiling when it goes along with a complete denial of their parents' involvement.

The avoidance strategies of Nazi perpetrators and their families have had consequences far beyond the specific individuals and families involved. First, in Austria, for example, attempts to deflect responsibility determined the postwar political landscape and were so successful that Austria was falsely internationally recognized as the first victim of Nazi Germany (see Uhl, 2001). Second, however, scientific research has mirrored many of these voids: Austrian political officials only ever acknowledged the responsibility and war crimes of Austrians during national socialism starting in 1988; scholarly ignorance mirrored these

psychological and larger cultural processes as historical research on Austrian Nazi perpetrators started at about the same time (e.g., Botz, 1987), while before, historians had only devoted attention to resistance by and persecution of Austrians, thus perpetuating the myth that Austrians were victims and not perpetrators of Nazi Germany.

While ignorance can be both socially and psychologically functional for the privileged, powerful, or even perpetrators because it serves to avoid feelings of guilt, not knowing may also fulfill psychological functions for members of subjugated, discriminated, or oppressed groups. North American feminist activists of the late 1960s and 1970s offer a starting point to consider how a position of oppression is translated not into knowledge but into a lack thereof and what psychological mechanisms may be at play here. Like other social movements of the 1960s and 1970s, radical feminists saw liberation as taking place on both an institutional and a psychological plane (see Rosenthal, 1984). In order to connect social and psychological liberation, radical feminists created consciousness-raising as both a political and epistemological method (see Ruck, 2015). Radical feminists engaged with psychology because their theorizing had been incepted by the observation that many women failed to fight against their oppression because they did not realize they were oppressed in the first place. For this reason, radical feminists compiled lists of so-called "resistances to consciousness" (e.g., Peslikis, 1970) that included, for example, glorifying, excusing, or identifying with the oppressor or other privileged groups, over-identifying with one's own oppressed group or other oppressed groups, diverse ways of escapism, overestimating agency in traditionally female roles, individualism, and many others (Sarachild, 1970). As these examples suggest, radical feminists were convinced that there were psychological mechanisms in place that kept members of oppressed groups from gaining insight into their own oppression.

It is critical theory that provided many radical feminists with theoretical direction (e.g., Firestone, 1970) and that more directly tackles the question of not knowing among the oppressed. Starting in the 1920s and against the backdrop of the missing revolution and, later, of rising national socialism in Europe, critical theorists of the Frankfurt School asked why individuals did not revolt against the very conditions

they suffered from (see Brunner, Burgermeister, Lohl, Schwietring, & Winter, 2013). They argued, for example, that in late capitalism the nuclear family produced authoritarian personalities who pursued a pseudo-rebellion against social scapegoats instead of revolting against their authoritative father and against those in power. Rising nationalism compensated these authoritarian personalities for their lack of power by affording them the illusion of participating in real power. Bringing these psychoanalytic reflections to bear on gender relations, feminist psychoanalysts have analyzed the formation of femininity under male supremacy. Christa Rohde-Dachser (2003) described the position of many heterosexual women in patriarchal societies as "complementary narcissists": Identified with their fathers, with men in general, and with the male gaze, women subject themselves but at the same time participate in men's successes and power via identification.

In the German-speaking countries, debates about women's psychological oppression and the benefits they gained by association with male privilege culminated in heated arguments about women's so-called "co-perpetration" (in their own oppression) (see Thürmer-Rohr, 2010). On the one hand, this debate revolved around women's roles during Nazi Germany and heavily criticized a long-standing lack of research into women Nazi perpetrators. On the other hand, it was argued that women also partook in the reproduction of patriarchy and other lines of oppression. As Christina Thürmer-Rohr recapitulated, "[w]omen are not only oppressed, abused, and tangled up in a destructive system, they also actively enter this system, win privileges, reap dubious approval, and benefit from their roles insofar as they fulfill them" (2010, p. 89; transl. N.R.).

These analyses help understand why women might be hesitant to give up the range of agency a given set of social relations affords and why, psychologically, they might deny the existence of gender inequities even when faced with them. For example, in the still-masculinist world of science, this may help explain why some accomplished female scientists still adhere to the belief in meritocracy despite battling significant sexism in their fields. Having achieved the approval and respect of their male peers, it may seem self-defeating to threaten this relationship and the privileges it affords by pointing out the sexism in science.

By endorsing meritocracy, the oppressed engage in "not knowing" or at least "un-knowing" the very experiences that keep others like themselves from achieving the same level of success.

Intersectionality helps explain the complex interrelation of oppression and privilege that runs through the above examples. According to intersectionality, various axes of oppression intersect in complex ways on the structural and the psychological level. Both politically and psychologically, these intersections pose the challenge that "those who occupy multiple subordinate identities, particularly women of color, may find themselves caught between the sometimes conflicting agendas of two political constituencies to which they belong" (Cole, 2008, p. 444). Elizabeth Cole has suggested that intersectionality can help move beyond identity politics by drawing the focus to the concrete coalitions individuals and groups build in their attempts to navigate and fight against oppression. Depending on these coalitions or allegiances some systems of oppression might be better knowable than others for those affected by multiple axes of oppression.

For many or even most individuals, oppression intersects with privilege and both positions may go along with not knowing or ignorance about mechanisms and consequences of oppression one either suffers or benefits from. Cole and Zucker (2007) found that US Black women were more likely to identify as feminists than US White women, indicating higher consciousness about gender inequities among Black women. They assumed that experiences of racial oppression sensitized Black women to sexism, too, while Cole (2009) theorized that White women may be complicit with the status quo because as daughters, mothers, or wives of White men they are closer to White male privilege and thus benefit from maintaining racial inequities.

Scholars engaging with the intersections between feminism, critical whiteness studies, and postcolonial studies have coined the term "occidentalist dividend" to understand why White women fend off insights into both their own oppression as women and into the racial and postcolonial order they benefit from (e.g., Dietze, 2010). Public discourse in many European countries, especially the German-speaking countries, has witnessed an obsession with the hijab of Muslim women, which has become almost synonymous with perceptions of women's oppression.

Gabriele Dietze employs the term occidentalist dividend to explain why many women partake in a discourse that problematizes gender inequities especially in Muslim communities and countries but denies them whenever the non-Muslim White majority is concerned. Relying on social psychologist Birgit Rommelspacher, Dietze also claims that "the larger the gulf between pretense [of social equality] and reality the bigger the desire to prove one's own progressiveness via a forced rhetoric of 'emancipation' and liberation" (p. 98). Hence, projecting gender oppression onto Muslim or other "othered" communities is psychologically functional in at least two ways for White non-Muslim women: it allows them to feel liberated, equal to men, and emancipated by contrast with the imagined oppression of Muslim women while at the same time deflecting responsibility and guilt for a system of racial and postcolonial inequality that discriminates against both Muslim men and women.

The Role of Reflexivity in Disrupting the Psychology of Epistemological Ignorance

In the previous sections we have outlined how psychological processes—such as the operation of identification or of defense mechanisms like projection, repression, or denial—can create and maintain epistemological ignorance among those in positions of power and domination as well as other ways of "not knowing" among those oppressed and subjugated by the dominant group. We might well ask how such psychological processes can be disrupted if the premise of standpoint theory is that one's social location affords the possibility of less partial, more expansive, perspectives. If multiple psychological forces work against becoming aware of and using one's social location as the basis for knowing, how does social location afford opportunities for knowledge, or for "knowing differently"? How can we escape the abyss of not knowing, and even more importantly, not knowing that we do not know? And what are the consequences for a psychology of science and technology?

To start answering these questions we draw on the work of Clare Hemmings, who has argued that the process of translating a social

location into critical awareness, knowledge, and even political transformation is mediated through a particular version of reflexivity: a reflexivity marked by affective dissonance (Hemmings, 2012). Hemmings starts her analysis from the position that identity or group characteristics alone cannot suffice as the basis for transformative politics; that simply "being" does not translate into "knowing" or "doing." There is a difference between simply "being" a woman of color in science, for example, and using that ontological status to access situated knowledge and become politicized. She posits that there has to be an affectively unsettling experience of disjuncture between "the experience of oneself over time and the experience of possibilities and limits to how we may act or be" (p. 149). The ability to recognize the gap between ontological and epistemological possibilities is mediated through affect—the rage, frustration, misery, passion, indignation—that is attached to recognizing that one's sense of self (e.g., as a scientist) is not realizable or is thwarted in a system that is fundamentally inequitable (by gender, race, class, etc.). This is not an automatic process. It requires reflexive activity defined as "reflection on the lack of fit between our own sense of being and the world's judgment upon us," a "*negotiation of the difference* between whom one feels oneself to be and the conditions of possibility for a liveable life" (p. 149; emphasis in original). Nonetheless, Hemmings argues that attending to this affective dissonance enables (and might even be required for) generating a counter-episteme that will allow one to know differently, and perhaps then to act differently.

The likelihood that one might experience such affective dissonance is of course influenced by one's position in the social hierarchy and one's relationship to systems of domination and privilege. Hemmings does not unpack or elaborate the conditions that would make it more or less likely that affective dissonance will be experienced and reflexively engaged versus repressed and/or dismissed. She only notes that an affective shift has to occur wherein current conditions are experienced as unfair and an alternative set of possibilities are therefore entertained. As she puts it, "But to move from knowing more to valuing that knowledge requires a shift of some kind…. I suggest that an *affective shift* [emphasis in original] must first occur to produce the struggle that is the basis of alternative standpoint knowledge and politics" (p. 157).

Historically, access to scientific educations and careers and pronouncements about who is suitable for science have been rigidly policed by those in positions of power (see Rutherford, 2015). The experience of affect too has been deemed antithetical to the "scientific attitude" as constructed by white, male, European-descent actors (Keller, 1985). Hemmings' analysis and emphasis on affect suggest that an important part of feminist psychological studies of science must attend to the processes whereby such affective shifts can be encouraged and leveraged as the basis for scientific counter-epistemes.

Concluding Thoughts on Scientists as (Not) Knowing Subjects

In this chapter, we have asked how epistemological concepts developed by feminist and critical race theorists may be further developed by considering psychological processes to inform a psychology of science that rethinks the relation between scientists' subjectivity, social location, and knowledge or lack thereof. We have pointed out that epistemological ignorance may be psychologically functional for those in power because it allows them to deflect responsibility and ward off guilt. "Resistances to consciousness" among the oppressed or subjugated, on the other hand, may help to imagine oneself as more liberated and emancipated than one actually is, they may serve to avoid conflict with authority figures, and, enable the maintenance of relationships with more privileged individuals and thus the transfer of benefits from these privileges as well.

How are these reflections relevant for psychological studies of science and technology? In the introduction we outlined some of the scholarships that demonstrate how the discipline of psychology has maintained and perpetuated gender stereotypes and how implicit and ingroup bias related to scientists' own gender influences research results and interpretations. More generally, however, systematic ignorance of blind spots and how they relate to one's own position within the matrices of oppression and privilege makes scientists and laypersons alike prone to assume their own experiences, perspectives, and theories as the norm

and to reproduce and stabilize power relations. Given that (many) scientists see themselves as immune from such systematic ignorance, perhaps a psychology of science and technology that elucidates the processes through which scientists' own social locations afford or occlude what it is possible to know could help open up new ways of scientific thinking, including about what constitutes science, how to practice it, and whose knowledge is valued.

Standpoint theories emphasize the relation between social location, experience, and knowledge, but they also point out that this relation is not instantaneous but mediated by political struggle and awareness. By drawing on Hemmings (2012) we propose affect as a mediator between social location, experience, and knowledge. In Hemming's view, what is required for the strong objectivity of standpoint epistemology—the translation of a disadvantaged social location into an epistemically advantaged position—is the experience of affective dissonance resulting from a disjuncture between one's sense of one's own capacities and worth and the way one is seen and treated within the social structure. Affect is at the core of Hemming's analysis, precedes the formation of identity, and is perhaps even necessary for the formation of (an activist) identity. However, these experiences of affective dissonance may be epistemologically relevant not only for those in the scientific community that are affected by oppression or social inequality but also for those in positions of power and privilege.

The affective shifts highlighted by Hemmings bear epistemological consequences for scientists. One can easily identify as a woman in science, for example, but identify more strongly with one's male peers and reject the label "feminist" if there has been no experience of affective dissonance and no reflection on that dissonance as the basis for what Hemmings terms "affective solidarity" with other women. Epistemologically, this lack of affective solidarity may well go along with a profound absence of knowledge about gender inequities by the very same subjects who are affected by them. In order to overcome this lack of knowledge the range of emotions (rage, frustration, sadness, misery, passion, indignation) attached to recognizing that one's sense of self is not realizable or thwarted within a fundamentally unequal system need to be acknowledged and lived as a first step. Conversely, it might be

other feelings like guilt or shame, that open up the potential of disrupting epistemological ignorance if recognized and experienced by those with power and privileges.

A systematic psychological analysis of how an affective shift occurs (or does not occur) would complement the preceding analysis of how not knowing or epistemological ignorance are enacted and maintained. Such analyses of the psychology and epistemology of affective shifts have to our knowledge not been conducted yet so we here offer some more preliminary suggestions for scientists to exercise reflexivity about their own social positions and their (lack of) experiences as they relate to their own knowledge production. Questions to guide a reflexive analysis might include: Where am I located socially on various dimensions of social inequality or oppression, including gender, sexuality, race/skin color, ethnicity, Nation/state, class, culture, health, age, place of residence/origin, assets, North–South/East–West, social development status (Lutz & Wenning, 2001)? What experiences have I made that are related to my own position as oppressed, discriminated against, subjugated, marginalized, or exploited, what experiences have I made that connect to my own position as privileged, as discriminating against other, as a bystander, as a perpetrator? How have these experiences resonated affectively? Have I ever experienced inequities as ego-dystonic, as an affront to my sense of self or of my values? Under what conditions and what inequities? What axes of social inequities or injustices, if any, have I addressed in my own research? Am I advantaged or disadvantaged, privileged or oppressed on the axes of inequity that I have included in my research?

After we have reflected on these social positions, experiences, and affects as they relate to our own research, we might want to address, individually or collectively with colleagues and/or friends, our very own "resistances to consciousness": Why, specifically, have we not devoted attention to any particular category, always keeping in the back of our minds whether we are privileged in this category or oppressed and that our social position might go along with specific blind spots or "resistances to consciousness" depending on our being privileged or oppressed. How does thinking about one or the other social injustice resonate with me affectively? Do I feel shame, anger, guilt, sadness, rage,

frustration, misery, passion, indignation? How do these feelings relate to my research subject or, conversely, to my research voids?

We do realize that this is a rather individualized psychotherapeutic approach to one of the oldest scientific aporias, i.e., the vastness of our ignorance. Nevertheless, we do believe that reflecting upon the affective nature of scientists' subjectivities might be one of the core areas of feminist psychological studies of science and technology. However, beyond attending to the psychological dimensions involved in processes of not knowing, the envisioned feminist psychological studies of science and technology would have to ask, much more systematically than we have done here, how exactly the psychological processes involved in not knowing of ignorance differ according to social location. Can we extrapolate a kind of "psychology of epistemological ignorance" that is specific to privilege and power on the one hand, and a "psychology of not knowing" of those affected by oppression, structural disadvantage, or subjugation, on the other hand? That is, how do power and privilege occlude or actively inhibit what it is possible to know, and conversely, how is "not knowing" also maintained within groups who are oppressed and subjugated? By tackling the affective dimensions of not knowing or ignorance while also being cognizant about their relation to social position and experience, such a feminist psychology of science and technology might finally bring psychology to bear fruit for feminist STS.

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