Towards an "Invested Empirical Method": Reclaiming Feminist Science Studies

Krista Scott-Dixon manages the Gender and Work Database project at York University. Her first book, Doing IT, explores the experiences of women working in information technology, and her second book, Trans/Forming Feminisms: Transfeminist Voices Speak Out, explores the intersections between trans and feminist ideas and activism.

Abstract
This article summarizes some of the contributions of feminist science scholars in order to explore the possibilities of a critical science of sex, gender, and sexuality, and suggests the radical possibilities of "invested empirical research methods" - investigative approaches grounded in both scientific method and an interest in social justice.

Résumé
Cet article fait le sommaire de certaines contributions de spécialistes de la science féministe afin d'explorer les possibilités d'une science critique sur le sexe, sur le genre et la sexualité, et suggère les possibilités radicales des « méthodes de recherches empiriques investies » - rechercher des approches basées sur la méthode scientifique et sur un intérêt pour la justice sociale.

Introduction

Clinical research on sex and gender differences has long interested the popular press and captured public imaginations. Mainstream representations of this research focus on subjects such as "brain sex" along with hormonal and/or genetic configurations as a means to explain bodily and gender differences and relationships, as well as sexual behaviour. Using language such as "hard-wired," "programmed" and "inborn" to suggest biological constraints, these popularized biological explanations typically confirm the social status quo, engage in speculative generalization, and/or reduce complex phenomena to a single element or cause. For example, the current best-seller The Female Brain, written by a clinical professor of psychiatry, contains statements such as, "Baby girls are born interested in emotional expression…It's the same kind of instinct that keeps a grown woman going after a narcissistic or otherwise emotionally unavailable man - 'if I just do it right, he'll love me'" (Brizendine 2006).

These images represent men and women as close to debilitated by their innate biological blueprints and shambling like single-minded, dimly conscious robots towards their respective, heteronormative sex-based destinies. Choice, chance, adaptation, diversity and variation, social structures, power imbalances, lived inequalities, and a host of other elements (including, frequently, evidence to support such claims) are absent from what feminist evolutionary biologist Patricia Adair Gowaty terms "just-so" stories (Gould and Lewontin 1979; Gowaty 2003). Such stories also, typically, reduce "difference" to sex-gender difference alone (Seitler 2004). While popular representations of scientific findings do not necessarily represent the nuances of the original research, and in fact may get the clinical findings entirely wrong, such representations are part of the discursive and epistemic environment in which clinical research is produced. A larger public concern with sex differences, and the legitimacy and "naturalness" of these differences, provides the milieu in which clinical research is performed, the epistemic validation for this research, and the grounds to

speculate on the significance of research conclusions (van den Wijngaard 1997). Given the public interest in and the dubious quality of much of popular science writing on sex and gender, we have to inquire into why and how sex, gender, and sexual differences become the sites of inquiry, and who benefits from them?

Feminist and other social justice-oriented scholars have critiqued the ideological currents both within scientific practice and mainstream representation, as well as the processes of knowledge production in the biological sciences.[1] However, this scholarship contains a number of gaps. First, particularly within work based in the social sciences and humanities, the body as body has largely gone missing, leaving only the imprint of its discursive figuration. While theorists have made sound critiques of the ways in which bodies and biology are represented in cultural products, psychoanalytic imaginings, and language (Bordo 1993; Butler 1993; Grosz 1995), there has been little discussion of the "meat" itself. "Bodies that matter" (to use Judith Butler's famous expression) have rarely, in fact, had much matter at all, and "feminists often approach analyses of matter both reluctantly and negatively" (Birke 1999; Hird 2003, 449).

Second, although much feminist and queer scholarship deconstructs and attempts to enhance empiricist work on sex, gender and sexuality with qualitative insights (Warner 2004), much less research goes in the other direction or uses peer-reviewed research from biological disciplines. Many scholars and activists concerned with equity and social justice have been quick to dismiss biological theories as essentialist and/or determinist, although some have taken the opposite approach, using biological "explanations" as political linchpins (Hird 2003). In either case, human physiology is understood frequently as a crude structure with limited possibilities for change or variation. Pointing to biological structures as players in human behaviours and identities may be seen as a reductionist move that excludes social context and limits complex phenomena to simple linear processes such as the inevitable and one-way behavioural action of a single brain region, hormone or gene. Yet this view of physiology runs counter to actual clinical evidence and work in a variety of fields such as anatomy and molecular biology, which demonstrate that although many structures are organized by a few simple rules, the systems are nevertheless often highly variable, complex and plastic (Fausto-Sterling 2005; Wilson 1998 and 2004).

Third, feminist scholars have often been hesitant to use empirical methods, arguing that they are based on an approach that, in its focus on measurement and detached analysis of observable phenomena, disregards things that cannot be quantified (and does not critically analyze the process of quantification itself); ignores social context; and by definition excludes marginalized knowers who are seen as irrational and/or biased (Code 1991; Haraway 1996; Harding 1998). Moreover, feminist and queer scholars have pointed out that ostensibly neutral forms of data collection are in fact loaded with cultural baggage (Klement and simpkins 2004). Not only does this data collection privilege particular forms of social organization, it cannot account for people who do not fit its parameters.

Yet a large-scale rejection of empirical methods and biological sciences limits the tools available to progressive scholars. It fails to consider the other important elements of the scientific method, such as repeatability, testability, and public scrutiny of ideas and findings. It leaves us unable to critique clinical research on its own terms or to respond to conservative forces who would use quantitative data as ammunition for regressive policy. Given the discursive power of science to explain the world and shape institutional practices, this is a crucial oversight on our parts. An anti-empirical stance deprives scholars committed to social justice of powerful tools for collecting and disseminating evidence about the value and extent of human sex, gender, and sexual variation. An anti-biological approach in a social context where biological data carries great social and political weight leaves the foxes guarding the henhouse.

In this article I will summarize some of the contributions of feminist science scholars in order to explore the possibilities of a critical science of sex, gender, and sexuality. This exploration presents the biological body both as material body and as an entity containing potential for progressive sexuality studies. It also suggests the radical possibilities of "invested empirical research methods" - investigative approaches grounded in both scientific method and an interest in social justice.

Sex + Gender = Sexuality?

One can say very little about the biological representations of sexuality without also speaking of sex and gender. Sex is generally understood by biologists as either defined by gametes (Roughgarden 2004) or a broader collection of morphological characteristics such as chromosomes and reproductive organs, that when evaluated as a whole are assigned the label of "male" or "female" (Fausto-Sterling 2000). In humans, biological sex is usually male or female, but various forms of intersexuality may occur in as much as 2 percent of the population (Blackless et al. 2000). Biologists may understand gender in a limited sense as the presentation of sexed and sexual features; thus, fish, birds and other animals may be said to have genders, and often more than two (Roughgarden 2004). In human terms, gender has a number of dimensions such as gender identity, role, attribution, and presentation (MacDonald 1998). Sex and gender may be understood slightly, yet significantly, differently by researchers in different scientific fields. Thus, although these terms are loosely organized and roughly coherent, given their variation in the natural world as well as the disciplinary heterogeneity of their conceptualization, the three dimensions of sex, gender, and sexuality resist oversimplification.

Despite the evidence in favour of a broad understanding of human sexuality, in fields such as evolutionary biology sexuality has been framed largely in binary terms and as a reproductive equation of sex and gender. Within such framing social inequalities and cultural organization in both humans and animals emerges from "natural" biological differences between masculine, sexually aggressive males and "coy" feminine females in the pursuit of gamete negotiation (Fehr 2004; Gowaty 2003; Hrdy 1986). So framed "sexuality" is taken-for-granted and rarely defined or interrogated (Gagnon 2004). Much less has been said scientifically about the often-complicated and contradictory elements of pleasure, desire, eroticism, passion, or romantic love, except perhaps as viewed through the lens of sexual deviance, which focuses on "paraphilias" and their intersection with gender transgression (Fagan 1994; Lawrence 2004). Heterosexual, middle-class, Western Anglocentric sexual ideals are taken to be universal norms despite abundant comparative data from other fields, such as anthropology, which observe a variety of human sexual practices, biological sexes, and gender identities (Blackwood and Wieringa 1999; Herdt 1998). Normative sexual ideals persist, despite the fact that Western Anglo society itself consistently fails to live up to them. Indeed, many studies attempt to delineate "true" or "authentic" sex, gender, and sexual configurations, choose select study populations to represent these, and explain away or erase the infinite number of exceptions in their data.[2] Because in many cases the methods themselves are faulty, and the evidence does not support many of the studies' conclusions or applications, feminist critique of these works would be enhanced by researchers' engagement with the empirical bases of the scholarship.

Variance in sex, gender, and sexuality is relatively common, and the concept of "variation," particularly as it is used in scientific discourse, is relatively benign. Unlike "variation," "deviance" has generally negative connotations. It is through the conceptual lens of "deviance" that many forms of sex, gender, and sexual variation are understood. Deviance both names variation and pronounces judgment about variation's relationship to the norm. Thus, deviance suggests a phenomenon that may be understood as an error, a divergence that is problematic for normative social values or biological taxonomies, or both. Deviance is the term frequently used to conflate biological variation and social judgements of such variation. While deviation from a racialized sexual norm of monogamous state-sanctioned heterosexuality may be a social problem, or not, it is not a deviation in a biological sense. Similarly, people whose gender identity does not match the gender assigned at birth may be assumed to be biologically variant, or socially judged as sexually pathological (Blanchard 1989; Chivers and Bailey 2000; Muscarella et al. 2001). Yet this is not an inevitable consequence of biological research. Other work such as Lippa's (2000) on gender traits of gays and lesbians provides a counterpoint to this approach. While Lippa is able to identify collective average tendencies in the chosen gender-typed activities of people who self-identify as gay or lesbian, he is also careful to point out that the "results do not imply that gay men are like women or that lesbian women are like men" (923, italics in original). Lippa is able to draw conclusions about a population without over-generalizing. He cautiously replicates studies with large sample sizes. He provides heterosexual controls; identifies divergence and variation within and between sample populations; emphasizes the

multiple dimensions of gender performance (as well as indicating minimal differences); incorporates a methodological critique of the measurement techniques used; and indicates the limits of the research.

There is compelling evidence that physiological features participate in shaping identities and behaviours throughout people's lives. For instance, the chemical basis of some mental illnesses, or the behavioural and cognitive changes from brain injury, is well documented. Considering a biological contribution to sex, gender, and sexual identity does not render a theory reductionist. Rather, problems emerge when nonharmful deviation is regarded as an error; when theoretical models do not accurately reflect practical complexity; when causality is misattributed and/or correlation spurious; when norms of body, behaviour and identity are derived from false universals; and when research with social and political consequences is produced without thoughtful consideration of context. Researchers must develop theories of the complex phenomena that make up sex, gender, and sexuality that are self-reflexive (i.e., they are self-conscious and critical about conceptualization and methods of inquiry), evidence-based, testable and robust. Outcomes must be repeatable in subsequent studies; reflective of the scope of human variation while cognizant of unifying elements; and be aware of the situated and context-based nature of inquiry as well as of the power dimensions that shape the research process specifically and society more broadly.

Knowing Bodies

Reluctance to use empirical methods and to engage with clinical evidence is not a universal tendency in equity-oriented scholarship. Feminist scientists have made significant contributions to the practice and production of scientific knowledge, particularly pertaining to biological research on sex, gender, and sexuality. Although they draw on a number of scientific fields including primatology (Hrdy, Haraway), endocrinology (Oudshoorn, van den Wijngaard), cell biology (Martin), evolutionary biology (Gowaty), physics (Fox Keller), molecular biology (Spanier), morphology (Fausto-Sterling), neuroscience (Wilson), ecology (Roughgarden), biochemistry (Hubbard), occupational health (Messing), etc., feminist critiques of scientific knowledge production have focused on a few key areas, which I will summarize briefly here (Harding 1998; Messing 1999; Nielsen 1990; van den Wijngard 1997).

First, feminist critques have reiterated that science is a social, and often a public, project (Cassidy 2006; Laslett et al. 1996). Although science is commonly seen as the "objective" accumulation of "facts," data collection alone is only one part of the research process. Knowledge of all types is not only provisional but relational (Code 1991). Facts do not speak for themselves. Even if we accept the notion that data collection is objective (which I do not), a scholarly study requires context, synthesis, and interpretation, which is largely a social and political endeavour. Second, feminists have examined methodological issues in knowledge production, including what questions are asked (or not) in research and how, who is studied (and by whom), how the answers are interpreted and causality attributed, and how conclusions are extrapolated (Harding 1998; Schiebinger 2004). This includes the primary conditions of the studies themselves; the conditions under which research is produced and circulated; how findings are accepted (or not) by a wider scientific community; how findings are publicized in science presses; and finally, how findings are publicized in mainstream presses, which, like a game of "broken telephone," may have very little to do with the original study results (Rolin 2004). A third line of critical analysis explores the conceptual structures, such as language, that organize research and make it intelligible both to other researchers as well as the general public.

One of the simplest yet most provocative methodological and epistemological questions feminists have asked is "What do we know?" (Code 1991). Feminists have challenged much that is taken for granted, arguing that "common sense" assumptions often inadvertently structure research design and outcomes. What "everyone knows" is frequently wrong, or entirely unsupported by experimental evidence, but "everyone" continues to "know" this simply because it seems logical in a certain social context. Although many scientists are well aware that facts about sex, gender, and sexual binaries are not so clear-cut, and experimental evidence is piling up to refute such claims (Fausto-Sterling 2000; Hubbard 1996; Weasel 2001), common knowledge may continue to organize primary research, and public representation of its findings. As Gowaty points out, "The 'facts' about males and females have been so intuitively obvious that only a few have ever asked if the 'facts' were correct" (2003, 906).

Often the data is available to researchers but they choose not to see it, or to interpret it in ways that are most comfortable and least disconcerting to dominant social agendas. For instance, speaking of the sexual behaviour of chimpanzees, Tuana (2004) writes that despite abundant evidence of non-monogamous, pleasure-oriented, and same-sex pairing, as well as orgasm in some primates, evolutionary theorists observing the behaviour often choose to present conclusions "right out of a Norman Rockwell painting" (222). Rachel Maines' (1999) delightful work on the development of the vibrator observes that nineteenth century doctors who induced orgasm via manual genital stimulation to treat their female patients' nervous disorders could not believe that the "hysterical paroxysms" generated could be sexual in origin - after all, women were supposed to be naturally chaste. Biologist Joan Roughgarden adds that in performing her own research into the "evolution's rainbow," she wondered why "nature's wonderful diversity in gender and sexuality," such as elaborate, highly social, and complex mating behaviours (often involving three or more animal genders), was not better known. She concludes that not only do academic disciplines themselves discriminate against diversity, but also suggests that "all our academic disciplines should go back to school, take refresher courses in their own primary data, and emerge with a reformed, enlarged, and more accurate concept of diversity" (Roughgarden 2004, 3; Weasel 2001).

Moreover, focusing on sexual difference as the central mode of difference between erases the vast differences within sexes and genders. It also erases variation among all humans based on other biological factors such as age, familial history and kinship group, disease and health, ability, and the physiological markers of growth, development, and daily life in particular environments. Other physiological factors such as skin colour or body size may be less significant to human organisms on their own, but may become highly significant when put into a social context.

Biological configurations can be more complicated than social values allow for. Biological study does not necessarily simplify the world - it can increase its richness, complexity, and diversity. Binaries, reductionism, or oversimplification may be no more correct or appropriate in biological than in sociological research. In both fields the data often simply do not support such conclusions. And yet, as Roughgarden (2004) points out, non-scientists hear little of this reality of biological study.

Deviation is Standard

> "We call contrary to nature what happens contrary to custom; nothing is anything but according to nature, whatever it may be."
>
> Michel de Montaigne, 1595

Because biological sciences ask and answer questions about "real life," scientific explanations for behaviours and identities evolve and interact with political, social, and economic currents (Haraway 1996). Within biology, material and symbolic dramas of race, sexuality, gender, the state, the family, and class are played out upon the "body of nature." Biological sciences also have significant practical and ideological power to explain the world. Feminist biologist Ruth Hubbard notes that it is a truism that because of its "rigorous objectivity, science reveals the Truth about Nature" (1996, 157). And yet, she adds, biases are most invisible and stubborn in questions about human existence, particularly when it comes to issues of sex, gender, and sexuality.

While no field of research is monolithic, and debate within scientific communities is always active, broad historical trends can be distinguished nevertheless. One of the grounding assumptions of Western scientific thought is the idea that all organisms fit into a larger system; and moreover, that scholars can identify and delineate things that are "normal" from things that are "deviant." "Normal" can be understood as simply that which is commonplace. However, "normal" can also be an ideological judgement and means of representing what is socially acceptable and desirable. Things that are not numerically common can be viewed as ideologically "normal," such as left-handedness. On the other hand, entire groups have been, and continue to be, excluded from "normal" even if they are present in large numbers; common behaviours can be excluded from what is considered normal, if people are not willing to admit to their prevalence.

Although variation is well-acknowledged in biological research, the conceptual schema of "normal" and "deviant" still organizes a great deal of work on sexuality. As biologist Joan Roughgarden writes, "In molecular biology and medicine, diversity is

pathologized; difference is considered a disease"(2004, 3). And yet variation persists. Humans insist on climbing out of their categories. Indeed, thanks to the Internet, the past decade has seen a virtual explosion of information about non-normative sex, gender, sexual practices and identities (and enthusiastic networking among those so identified). Indeed sexologists, even in the 1960s, could scarcely have imagined its scale. How, asks Roughgarden, "does biology account for such a huge population that doesn't match the template science teaches as normal?" (2004, 1) Her response is simple: poorly and inaccurately. "When scientific theory says something's wrong with so many people," she writes, "perhaps the theory is wrong, not the people" (2004, 1).

Although knowledge production and its representation intersects with social, political, and economic anxieties, normality and deviance are frequently seen as biological properties of individuals rather than concepts with a social and political basis. Scientists have often hunted for signs of racialized and classed sexual deviance and "degeneracy" written on the body, including studies of breasts (Schiebinger 2004), skulls (Schiebinger 2004), arm length, jaw structure, genitals (Tuana 2004), and hand structure (Seitler 2004) or preference (Green and Young 2001). There is presently a certain impetus to re-inscribe sex-gender differences and discover the "cause" of particular sexual orientations.[3] Indeed genetics and/or neurological conditions may contribute to gender and sexual orientation. Yet, the current framing of the issue reflects prevailing popular notions of biological causality: that one structure is entirely responsible for a complex identity that is lived in a web of social relations. The current framing of sex and gender also suggests that biological structures are unchanging and determinative; that biological factors work in a one-way direction (i.e. from body to behaviour), unmediated by environment or even other biological factors; and that physiological "facts" preclude any further political discussion of the lived inequalities of people.

On the other hand, when studying sex, gender, and sexuality, many researchers will point to variations such as intersexuality, transsexualism, and homosexuality as evidence that the world is a diverse place. In this claim they would be justified, except for two key conceptual flaws. First, the norm itself is rarely questioned. This is like speaking of racialization without mentioning the hegemonic power of whiteness; like examining class without examining capital or the ruling elite; or using "gender" to refer only to women. Such a conceptual absence presumes that the norm is a uniform, unvaried category consisting of perfectly sexed, gendered, and sexually oriented individuals. It makes invisible the power dynamics that reinforce and reproduce a division between "norm" and "different," as well as the always-contingent status of people within the "norm" category - the ways in which most "normal" people themselves do not fit the norm. This absence also ignores the intersections of racialization, class, ability, age, and a host of other elements that within a context of power inequities, fundamentally structure who we are and what is socially valued. Second, by generating new taxonomies of what kind of sexes, genders, and sexualities count as diverse (and hence subversive), activists dedicated to the expansion of sexual categories may inadvertently repeat the errors of those who seek to constrain sexes, genders, and sexualities via biological normalization. The norm is left intact as a norm, and identities constructed in opposition to it are like a teenager rebelling against his or her parents: despite the histrionics around the youth's process of self-actualization, the point of reference is still the parents.

What is normal and what is deviant can only be understood in dialogue. Each needs the other to become intelligible. Holding scientific and medical researchers accountable for their roles in defining the norm and pathologizing difference is essential. However, scientists interested in social justice should seek to move beyond this dichotomy. As they work to illuminate the richness and rightness of variation, they should also work to critique the taken-for-grantedness of the norm.

Against Essentialism: Reclaiming Biological Diversity as a Feminist Project

It is tempting, given the array of concerns about knowledge production in the biological sciences, to reject the whole soiled physiological project altogether, and instead to turn towards the rich tapestry of social, cultural and political discourse, representation and interaction as a means of understanding and questioning sex, gender, and sexuality. It is also tempting for groups who have been previously marginalized to find solace and the basis for political resistance in the idea that they were "born this

way." In both cases, human physiology is often envisioned by non-scientists as a relatively crude structure whose potential for change or diversity is minimal. The idea of having a "male" or "female" brain, or a "gay/lesbian" or "straight" gene, is fairly straightforward: either you have it or you don't, and that's the end of that.

Satisfying though it may be to respond with a biological "I told you so" to conservatives who claim that non-heterosexual, non-gender-normative behaviours and identities are immoral lifestyle choices; this does not eliminate the social inequalities that perpetuate the devaluation of human variation. Indeed, biological proof without accompanying political resistance may enable regressive forces to attempt to eliminate "nature's mistakes." Such a simplistic model is not supported by the primary clinical evidence and research in many branches of biological sciences, which demonstrate variation, complexity and malleability in human physiology. This evidence is both exciting and dangerous: it provides possibilities for scholars to take up the project of diversity and equity, all while being well-supported by research data; it may, however, also provide new openings for attempts to eliminate variation as "biological errors," or to commodify yet more elements of life.

It is also important to note that despite what may seem to non-scientists as an overall coherence in systems of scientific knowledge, scientific researchers do not always agree. Concepts, terms of reference, and findings continue to be subject to dispute and debate within and between scientific fields (Seitler 2004; Wylie 2000). Since, however, "scientists tend not to wash their dirty linen in public" (Cassidy 2006, 175), researchers who do not engage with primary data may find themselves relying on inaccurate presentations of biological data and theories. Feminists wary of "scientific conspiracies" that may seem to essentialize complex identities may themselves essentialize scientists and their practices if they do not work directly with such material.

A modest little piece in the Journal of Pediatric Urology (Cheiklehard et al.), which explores the factors involved in determining sexual and gender identities, provides an example of what an invested empirical approach attentive to clinical evidence but also invested in social justice might look like. Not only do the authors carefully explain that many factors play into the complex processes of identity formation, they also admit that a great number of factors operative in these processes are "mostly unknown" (2005, 383). Even more surprising is that they acknowledge the role of intersex activists in getting researchers to think about traditional practices of infant surgery to "correct" ambiguous genitalia. "[Activists'] feedback has come to challenge our medical dogmas," they write, which "has led us to think that sex assignment was always a wrong choice...we still need criteria allowing us to predict the SI [sexual identity] correctly, but we also need to know to what extent our decisions are wrong" (386). Such an example of multivariate thinking, as well as empirical humility and openness to social change via patient response and political action, provides a role model for other studies to emulate.

Towards "Invested Empirical Methods"

Despite an avowed dedication to reason, "objectivity," and cold-hearted logic, the practice of science is riddled with passion, intuition, accidental discoveries, hunches, and other very non-logical elements...much like human sexuality. Non-feminist scientific researchers have often reacted with dismissal, defensiveness, or even hostility to feminist critiques of their work (van den Wijngaard 1997). In part, this may represent a response to a challenge to ideas in which researchers are emotionally invested. As Fausto-Sterling writes, "We all have emotional attachments to subject matter that comprises a field we love so deeply that have chosen to devote our entire lives to it" (2003). Nevertheless, feminists have made some inroads. As Gowaty attests, however, "ideas that come out of feminism are taken seriously as long as they are discussed in terms of their testability, which is the hallmark of all ideas tolerated by scientists" (2003, 902). What changes "normal science," she argues, is the "accumulation of data inconsistent with current dominant hypotheses...the most efficient route to changing an entrenched scientific idea lies in carefully designed, well-controlled empirical tests" (903).

In other words, if feminists and other social justice-oriented researchers wish to have their concerns addressed, they must learn to fluently speak the language of the scientific method along with the polyglot they have already mastered: economics, law, political theory, psychoanalysis, cultural criticism, history, etc. This is not to say that researchers should accept

such a method uncritically. Indeed, one of the strengths of feminist work in this area is its ruthless evisceration and careful reconstruction of all the truisms that non-feminist researchers hold dear. Still, we need clinical evidence. We need empirical data. We need controls and careful observation and well-substantiated, thoughtful conclusions that unambiguously demonstrate the diversity and richness of humanity that we already know intuitively to exist (or, perhaps, conclusions that also reject many of our own cherished assumptions). As long as feminists "are armed predominantly with critique," and cannot produce alternatives to traditional models, "feminist scholars of science will continue to be perceived as anti-science, and the prospects for a re/constructed feminist science will remain a distant, blurry vision" (Weasel 2001, 28). This empirical focus and method is not the only tool in our toolbox, nor should it be, but it is a good one. We need to address research that affects our lives on its own terms, and move towards making those terms our own. We cannot afford to dismiss such work as evidence of a nebulous scientific conspiracy. Even scientists working in the same lab cannot agree with one another. Scientific discourse is shaped by debate, diversity, and disagreement, and we can intervene as long as the terms of engagement are mutually accepted and we do not lose sight of the goal: science as an emancipatory project. Rather than a limitation or a failing of science, the inherent "imperfection of scientific knowledge" is also an invitation to us: to collect more puzzle pieces, to deepen understanding, and/or to challenge and debate "common knowledge" (Gilbert and Fausto-Sterling 2003, 242).

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Endnotes

1. In this article I will assume that feminist, queer, anti-racist, and trans-positive scholarship share similar goals of social justice. While I recognize that there is dissent and debate among streams of thought, for the purposes of this article I will assume that we are working towards shared ends: namely, the elimination of multiple and interlocking oppressions. I use the term "progressive scholarship" as a shorthand to denote this. However, since feminist scientists have provided a rich body of scholarship in this area, I will also allude to it directly.

2. See, for example, Blanchard (1989) on defining "true transsexuals" and Hooker (1963) on "pure homosexuals."

3. See, for example, Moore and Travis 2000 on the "gay brain;" and Conrad and Markens 2001, and Miller 1995 on the "gay gene."

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