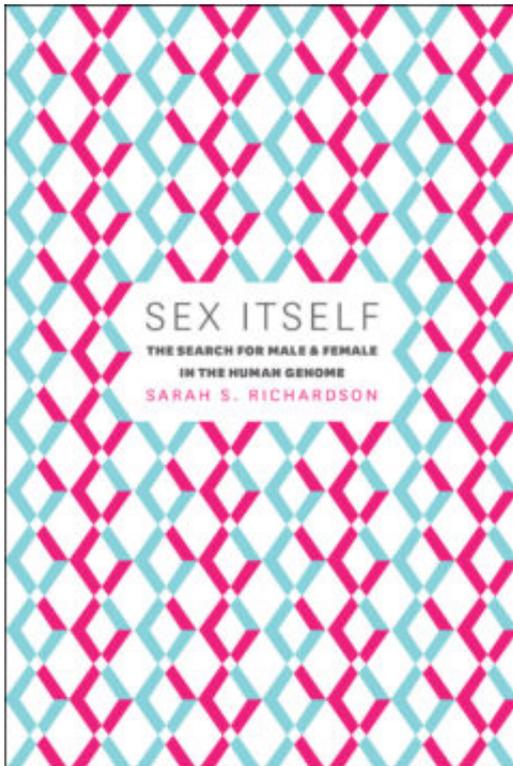


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Sarah Richardson's Sex Itself: The Search for Male and Female in the Human Genome

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By Paula Martin



[Sex Itself: The Search for Male and Female in the Human Genome](#)

[Sarah Richardson](#)

University of Chicago Press, 2013, 320 pages

In *Sex Itself: The Search for Male and Female in the Human Genome* (2013), Sarah Richardson takes gender criticism to a new level — the genomic one. Following the work of noted scholars such as Evelyn Fox Keller (1995), Anne Fausto-Sterling (2000) and Emily Martin (1991), Richardson's text explores the interplay between biological notions of sex and cultural conceptions of gender. With close historical attention, *Sex Itself* takes as its analytic object the sometimes bewildering practices

making up the “search” for sex, from the discovery of distinct X and Y chromosomes to the attempt to enumerate the genetic differences between males and females. Richardson compellingly argues that gender is central to our understandings of chromosomal sex, and advocates for the acknowledgement of the interplay between sex and gender so that we may recognize how gender acts not only as a source of bias, but as a productive force driving genetic research.

Richardson troubles the etiological explanation of sex often assumed in both scientific and popular discourse; where genetic factors are taken as necessarily prior to other biological components and socio-cultural notions of gender are overlaid upon individual bodies and biologies (Chapter 1). Instead, she draws out themes of dynamism and exchange, noting how scientists have historically overlooked inherent ambiguities in the relationships between X and Y chromosomes in favor of promoting findings which support gendered ideas about biological sex differences. Though Richardson’s critical analysis centers on the ways in which socially contingent meanings of ‘male’ and ‘female’ have fundamentally shaped scientific practice, she does not shy away from technical and historical detail. Fortunately, her impressively clear writing, and the clever illustrations judiciously sprinkled throughout the text, help her less scientifically inclined readers quickly develop requisite familiarity with core biological and genetic concepts.

The text comprises ten chapters that trace the historical development of scientific understandings of sex, with the first and last chapters providing a conceptual overview and potential implications of her argument, respectively. Chapters 2 and 3 describe both the first discovery of X and Y chromosomes in 1890 and their condensation into the “sex hormones.” Tracking the engagement of a handful of key experimental biologists, primarily in the United States, Richardson shows how theories of sex determination changed over the first part of the 20th century. She argues that powerful social concepts of gender influenced the framing of scientific research on every level — from linguistic choices in publications to the objects taken as deserving of scientific inquiry. Her approach complicates scientific rhetoric of linear progress where older, untrue, findings are replaced by newer ones due to technological progress. Instead, Richardson is concerned — and rightly so — with the myriad ways in which prior concepts inform scientific advances even when older findings become discredited.

As Richardson writes, the goal of the text is to explore the role of gender in the practices, claims, and theories of genetic science (Chapter 1). One way she does this is by a close assessment of the conflicts undergirding scientific progress, reflecting in part Bruno Latour’s call in *Science in Action* (1987) to follow the controversy. In the case of the discovery of X

and Y chromosomes, this includes demonstrating the key role of the research of Nettie Maria Stevens, a female biologist whose contributions are often overlooked. This is an important acknowledgment of the many levels that gender inequality works in the sciences; even the story of scientific progress is unable to escape the influence of dominant gender ideology (the overarching social understanding of male and female in the US (12)) which subsumes the roles (and biologies) of women to men. Though initially controversial, ultimately sex chromosomes become the terminology of choice, despite Stevens' preference for the more general "heterochromosomes" (43). This linguistic shift solidified a binary relationship between male and female biologies as well as concretized the ontological foundations of gender difference (Chapter 3, "How the X and Y Became the Sex Hormones"). The enduring significance of terminology resurfaces in Richardson's final arguments, where she maintains that acts of naming on the genomic scale reflect and contribute to social ideas of gender as well as delineate the spaces of appropriate research (206-207).

Chapters 5 and 6 emphasize the myriad ways in which the X and Y chromosomes become "sexed." Tracking the influence of culture, in particular gender ideology, the mosaicism of the double x became symbolically reflective of feminine "instability," "mystery", or "complexity" (110). Genetically speaking, mosaicism refers to the fact that female cells contain a mixture, or "mosaic" of X-chromosomes from both parents. In some cells, the paternally inherited X-chromosome is expressed, while in others, the maternally inherited X is expressed. On the other hand, males can only express the sole maternal X-chromosome they have. Additionally, research on criminality and the hypothesized XYY "supermale", though short lived and rife with methodological and interpretive flaws (87), contributed heavily to the interpretation of the Y as the source of masculine aggression (Chapter 5, "A Chromosome for Maleness"). Richardson compellingly shows how the 1960's and 1970's view of sex and gender differences sustained the super-male hypothesis despite the strong evidence against interpreting an additional Y chromosome as indicating a higher likelihood of exhibiting violence, or aggression. While intersex advocates and sex researchers have changed some aspects of genomic sex research, Richardson argues that interpreting X and Y chromosomes as the essence of sex categories persists in research to this day.

What makes Richardson's argument so compelling is, in part, her ability to avoid striking too hard a dichotomy between biological and cultural determinations of sex. By taking the development of scientific knowledge seriously, she is able to show the ways in which complexity and nuance becomes flattened in the race to create biologically causal models explaining some of our most human categories, without negating the existence of biological entities or foreclosing the relationship some of

those entities may have to cultural forms. As Richardson rightly points out, feminist critiques of science have a long history of pointing out the existence of bias in science, in particularly showing how finding the socially expected (sex differences rather than sex similarities, aggression in the x, passivity in the y) has neglected other kinds of biological evidence, sometimes with disastrous consequences. *Sex Itself*, however, reaches beyond assessment of bias to argue for a more textured reading of the possibilities of integrating critical attention to gender into biological research on sex.

“Modeling gender in science,” as Richardson calls her approach, includes not only “gender criticality” or the practice of unveiling how gender operates in scientific pursuits, but also “gender valence” (Chapter 1, “Sex Itself”). She coins the concept of gender valence in order to distinguish her argument from feminist critiques which have primarily emphasized the production of bias, and to provide a way forward for scientists working on biological sex differences. To be gender valent, research must openly discuss and describe gender conceptions and often gender politics (17). To embrace a partiality of perspective, drawing on Donna Haraway’s notion of situated knowledge (1988), is not to limit the capacity of making scientific arguments but rather to articulate already existing constraints, assumptions, and biases. For Richardson, “visibility” and “flexibility” characterize gender valence (17), identifying the importance of both individual practices for those engaged in experimentation, publication, and research as well as social practices which normalize treating gender and sex as salient research categories. In particular, Richardson shows how often scholars who directly engage with gender politics are thought to be too explicitly feminist to also be sufficiently objective (Chapter 8, “Save the Males!”). However, Richardson notes that contrary to popular opinion, choosing not to discuss the impact of gender does not itself protect research from the impact of gender ideology. Rather, only transparency and explicit discussion can create more responsive and ethical research, as well as identify and remove bias.

What really matters in genomic sex research, Richardson tells us, is not denying differences in genes or the relationship between cultural concepts of gender and biological categories of sex, but rather critically and reflexively including the categories in genomic research. Her largest theoretical contribution is the reformulation of sex as a “dynamic dyadic kind,” in Chapter 9 (197-198). Treating sex as a new “kind,” or a new category altogether distinct from other individual biological characteristics foregrounds the incommensurability of sex and species as well as the mutually constituted nature of male and female in humans. Richardson is careful to write that she refers only to gametic sex, arguing that viewing sex as a “dynamic dyadic kind” is different from viewing sex as a strict binary, or two separate *genomes*, as it emphasizes a genetic perspective

which takes both sexes as essential to the unit. I understand Richardson as attempting to hold fast to the biological necessity of researching sex differences while also considerate of the many interlocking factors, the “dynamicism” that makes up sex. However, despite her consideration of intersex conditions and anomalous chromosomal makeup in much of the rest of the text, it seems that the notion of a “dynamic dyadic kind” still shies away from fully incorporating a consideration of individuals whose biologies diverge from the expected genetic makeup. The potential for incorporating intersex conditions into the theoretical framework remains in potential, or perhaps assumed, rather than fully described.

While *Sex Itself* may not seem to present a fundamental overhaul of genomic sex research on its first read, Richardson’s detailed analysis of the interplay between gender and sex in the age of genomic research provides numerous suggestions both large and small for those engaged in biological sex research and those who study the interplay between gender, sex, and science. Many of these suggestions, if taken seriously, will lead to tectonic shifts in the ways that research on sex and gender is done. The risk of reverting to an overly rigid binary view of sex as well as the potential of genetic research to codify differences in sex is acknowledged (216), with the hopes that confronting not only biases but constructive influences from the outset will lead to better scientific practices and more robust genetic knowledge. Overall, this is an excellent addition to the feminist science studies literature, which should enjoy a wide readership across disciplines.

Paula Martin is a graduate student in the Department of Comparative Human Development at the University of Chicago. Her research focuses on the experiences of puberty and puberty suppression for transgender and gender nonconforming youth.

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