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“WHAT IS THE M/F PROBLEM?”: CRITICAL DISCOURSE ANALYSIS IN ANNE
FAUSTO-STERLING’S, *SEXING THE BODY: GENDER POLITICS AND THE
CONSTRUCTION OF SEXUALITY*.

by

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ABSTRACT

Current dominant understandings of biological sex and gender that rely upon binary constructions are problematic on cultural, political, and individual levels. Cultural misunderstandings of the complexities of biological sex have harmful consequences, including the unnecessary surgical and medical interventions on intersexed bodies and the negative psychological effects of gender stereotypes. Anne Fausto-Sterling's book, *Sexing the Body: Gender Politics and the Construction of Sexuality* (2000), advances necessary progressive feminist perspectives on the subject. I employ critical discourse analysis comparing original scientific and academic discourses with the author's translations. I argue that she questions binary sex development and assignment in ways that challenge the problematic foundational arguments of Science. This study contributes to current research on the rhetoric of science, positioning *Sexing the Body* as a model for engaging a dual audience, and as a pedagogical tool for scholars who translate knowledge from specialized disciplines in the Sciences for popular audiences.

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CHAPTER 1: INTRODUCTION

There are severe cultural, political, and personal consequences which are attributed to current notions of biological sex and gender. First, most egregious and least discussed as such, is the current western practice of genital mutilation on infants born with varying degrees of ambiguous genitalia (Chase 1998a, 1998b). Approximately two percent of children, around eighty-thousand, a year are subjected to invasive and often dangerous surgeries that are medically unnecessary, performed solely in order to preserve cultural consistency in dichotomous sex (Faust-Sterling, 2000). Further, the concept of gender itself is predicated on an established binary sex – feminine and masculine behaviors, etc. – and has well-researched sociopolitical implications. Issues for the LGBTQIA community range from personal safety (Montano, 2017; Palm, 2018; Wilson, 2018) to political agency (Arana, 2018; Kentish, 2017; Shear & Savage, 2017). Further, women continue to be underrepresented in STEM careers even though, more often than not, they outperform them in the field while in college (Fine, 2010).

The last of these issues originates from the psychological impact of gender bias on women and men. Cordelia Fine (2010) cited sociologist Shelley Correll as she argued, “how easy it [was] to create a gender stereotype that diminishe[d] women’s confidence and interest in a supposedly male domain” (p. 49). In other words, if you are told that you don’t belong somewhere long enough, you start to believe it, and vice versa. Moreover, within the field genetic science, as it advanced the “stock-breeding” metaphor of eugenics, there came an association between genes and performance predictions (Condit, 1999). That is, male and female genetic makeup was operated as empirical evidence explaining sex-discrepant phenomenon.

The few major issues mentioned above represent only a brief glimpse of the many consequences of our current notions of binary sex and accompanying beliefs about gender. Moving forward, it is essential that we question what is taken as fact about our differences, and champion more radical philosophies that exists both in Science and academia. I argue that Anne Fausto-Sterling's second book, *Sexing the Body: Gender Politics and the Construction of Sexuality* (2000) (hereafter referred to as *Sexing the Body*), exemplifies the revolutionary reimagining necessary to address these and other issues that are the result of our misunderstanding of sex.

SEXING THE BODY AS A SIGNIFICANT ARTIFACT

Sexing the Body represents a culturally significant artifact for its unique genre, its immediate and lasting impact on both scholarly and public discourse, and its radical content concerning sex development and assignment. First, as a book-length scholarly essay (Varghese & Abraham, 2004), *Sexing the body* exemplifies a hybrid genre which fosters a combination of academic rigor/standards, accessibility to lay audiences, and theoretical and philosophical considerations beyond those enabled in academic journals. Adhering to the academic expectation of evidence-based claims, I explore and argue these points in more detail in a later section.

Second, the author's research regarding various aspects of sex development is cited in journal articles, scholarly books, and conference papers concerned with, to name a few examples, neuroscience (Fine, 2010, 2017), genetics (Kaplan & Rogers, 2003; Happe, 2013) and even sports (Travers, 2008; Wiederkehr). The book received "positive, even glowing, reviews...in the *New England Journal of Medicine*, in *Choice: Current Reviews for Academic Libraries*, and elsewhere" (Schiff, 2001). In other words, the book

was critical to engaging and furthering existing scholarship and academic debates on the issues discussed in her book and was generally well-received in expert circles.

Furthermore, its impact on public discourse immediately after its release and well into later years, is noteworthy. A New York Times journalist noted that she was already a celebrated researcher, as *Myths of Gender* “[was] used in women’s studies courses throughout the country” (Dreifus, 2001), which could be argued to have improved her ethos with both academic and popular audiences, aiding the reception of the following book. The published interview explored Fausto-Sterling’s radical counterpoints to notions of traditional developmental biology and did so in a medium that is mentioned by the Pew Research Center as one of the top three circulated magazines in the US (Barthel, 2018). *Sexing the Body* was also taken up in *Ms. Magazine* (Coventry, 2000), where the writer used statistics from the book to discuss the number of genital anomalies occurring each year – around 80,000 cases.

In *Here Magazine*, Joe Galbo (2000) wrote about a conversation he had while on his way to an academic conference with a 64-year-old woman going in for sex-change surgery. *Sexing the Body* was twice referenced in “A Brief Guide to Gender Terminology” at the end of the article, once as a book to read in general, and again for its statistics on intersexed occurrences. More recently, in 2015, Barbara J. King, wrote an article for NPR titled, “What Does It Mean to Be Intersex?” In the report, she noted that her anthropology and gender undergraduates “... start by discussing *Sexing the Body*... which lays out the anatomical and genetic science of the situation and explains how quick the medical profession has been to surgically ‘fix’ babies identified at birth as intersex, by sculpting the body to make it functionally male or female” (King, 2015).

This last example illustrates the simultaneous impact the book has had on pedagogy in higher education and popular discourse. Lastly, the book remains available to a wide audience as it is still in circulation, offered in print (hardcopy and paperback), e-book, and audiobook online and in book stores across the country.

Finally, Sexing the Body represents a significant artifact for analysis owing to its radical content. Fausto-Sterling, unlike most gender theorists, does not presuppose a binary biological sex. As I review in the following section, most past and current research on sex and gender operates from a position where biological sex is a taken-for-granted fact, subsequently situating gender as the primary concern. Researchers in women's studies, gender studies, and similar fields, have focused on aspects like the personal, political, and cultural repercussions of gender norms, where biological sex is not in question. For example, Cordelia Fine (2010, 2017) wrote extensively on the application of neuroscience in uncovering and understanding differences between the sexes based on cognitive orientations.

Although she states that “[t]he sheer stability and staying power of the idea that male and female psychologies are inherently different can’t help but impress” (xx), her ultimate critique is of the methods used to substantiate those claims, not the claims themselves. She concludes that social and cognitive factors are interconnected in the determination of gendered behavior, and that “when researchers look for sex differences in the brain or the mind, they are hunting a moving target. Both are in continuous interaction with the social context” (236). In other words, sex – “the basic, determining...factor...for the reproductive system” (Fine, 2017, p.92) - is not the basic

determining factor to establish male and female brains; however, this framework still privileges genitals/sex organs as the main indicators of sex difference.

Additionally, the work of Alice Dreger (2015) fiercely argues against the medical intervention of socially unaccepted, yet medically functional, genitals. However, a key difference between her work and Fausto-Sterling's is the radical next step of viewing "sex" as a deficient category of understanding by deprivileging genitals as the marker of identification. In other words, the argument presumes that sex organs/genitals define biological sex, thus constructing the concept of distinct behaviors (read gender), and studies should then focus on how and why those differences exist. The challenge to that notion is a particularly radical one, which Fausto-Sterling notably takes up in *Sexing the Body*.

In my study, I argue that Fausto-Sterling maintains the integrity of the arguments that she translates from scientific/academic discourses regarding biological sex development and assignment, and in doing so provides a model for critical scholars in communication and rhetoric for attending to the moral problem of scientific accommodations for popular audiences. Further, in light of the issues addressed in the introduction, I contend that it is of vital importance for non-expert audiences to be provided with reliable and accessible translations of Scientific information on the subject and that the perspectives advanced must question taken-for-granted notions of binary sex development and assignment in ways that challenge the inaccurate and harmful foundational arguments of associated dominant ideologies.

Lastly, I maintain that Fausto-Sterling's work highlights the utility of this hybrid genre – the book-length scholarly essay - for critical scholars in the field of

communication and rhetoric. Given the unique space provided by the book-length scholarly essay, alternative theorizations existing outside the accepted practices of research articles can be explored in new and important ways. These intellectual speculations are important for reimagining potentialities towards novel conceptions of sex and its relationship to the body and identity.

RESEARCH QUESTIONS

This study is guided by three research questions. First, how does Fausto-Sterling translate technical arguments questioning biological sex for a popular audience? Second, how do these translations vary from their technical origins? Finally, what rhetorical and/or ideological work is accomplished by these translations?

PREVIEW

In the following chapter, I situate Fausto-Sterling's work within scholarly considerations of Science Studies, including from the perspectives of cultural studies, women's studies, and communication and rhetoric. First, I highlight the foundational critiques of Science, moving through the research on the rhetoric of science. Next, I discuss feminist interrogations of scientific discourse and practice, and its application of such critique to the science of sex. Then, I consider research on the rhetoric of genetic science and the translation of all these technically focused arguments between audiences. Finally, in the last section, I explain the ways that book-length scholarly essays achieve a middle-ground between technical and popular-audience writing—between forensic and epideictic rhetoric. Specifically, I position *Sexing the Body* as a model for this genre using Fausto-Sterling's critiques of scientific rhetoric and practice; gender and Science;

and the ideologies of genetic science as examples in line with features of book-length scholarly essays.

CHAPTER 2: LITERATURE REVIEW

SEEING SCIENCE AS A SOCIAL PROCESS

Sexing the Body expresses numerous aspects of scholarly research into the sciences, namely research on the rhetoric of science, feminist critiques of science, and the more recent rhetoric of genetic science. It is the decades of this groundwork which allowed Fausto-Sterling to be in a position to write content like that found in this book. Critically, the promoted authority of Science was questioned by philosophers of science. Thomas Kuhn (2012) opened the door to critiquing the notion of science as fully objective praxis, being without social influence and lacking the fingerprints of its practitioners. He argued that there was a social context to knowledge production in the sciences. He demonstrated this, stating, "...new paradigms are born of old ones...[b]ut they seldom employ [the] borrowed elements in quite the traditional way. Within the new paradigm, old terms, concepts, and experiments fall into new relationships one with the other" (149). That is, as Science shifts from one paradigm to the next, there is an interpretive and relational element that defies its supposed objective nature.

Building on this knowledge, Fay and Moon (1977) questioned the paradigmatic positioning of physics in scientific inquiry, which was used to justify the belief in its objectivity. They came to the conclusion that the fundamentally different theoretical requirements of science versus social science proved that physics could not be, and was not, the paradigm of scientific inquiry. This critique, and similar others, helped spur the argument that Science was a fully social process. Further examinations of the history of

science provided insight into its culturally-bound processes and further critiques gained momentum, calling into question its methodologies (McAllister, 2014), and highlighting gendered discourses which permeated its various institutions (Keller, 1989).

Researchers in communication studies took on research on the rhetoric of Science along two partly parallel trajectories. One, the more formal approach to Rhetoric, which examined the rhetorical strategies of scientific writing upon which its success or failure as persuasive communication hinged. Two, a feminist perspective which examined Science's discourses and practices, illuminating the impact they had on the social world. In research on the rhetoric of science aimed at studying its persuasive communication, early works illustrated that Science was a rhetorical activity. Researchers examined its modes of inquiry, reasoning, specialists' ethos, organization of publications, and types of discourses and argumentation (see Bazerman, 1996; Campbell, 1990; Gross, 1996; Phanestock, 1999; Miller, 1984; Prelli, 1989).

Recent studies outweigh the space available here, but scholars have taken up analyses of orders of discourse and audiences in socioscientific controversies (e.g. Stewart, 2009), scientific controversy in public debate (e.g. Ceccarelli, 2011), the relationship between science, rhetoric, and politics in a "world risk society" (e.g. Danisch, 2010), and, in line with the new materialist rhetoric of science, disability justice and genetic engineering (e.g. Benjamin, 2016). As technology forces a more interdisciplinary approach to rhetoric of science (e.g. Graham, 2015), the scholarship aimed towards new materialist rhetoric of science continues to grow.

Early feminist critiques of Science adopted a social justice lens through which to analyze how Science was used in service of oppressive agendas (Harding, 1986),

specifically taking issue with its gendered discourses and practices. Sexist language bolstered the ideologies of Science (Norman, O., 1998; Rutherford, A., Vaughn-Blount, K., & Ball, L. C., 2010; McGee, E. O., & Bentley, L., 2017), and feminist scholars brought to light the many ways in which it affected women as a group (e.g. Haraway, D., 1985, 1989; Harding, S., 1986; Smith, D., 1981). They demonstrated how these ideologies reinforced systemic oppressions which devalued women's knowledge on a whole (Hartsock, 1983). The feminist works produced over the years verified the "massive historical resistance to women's getting the education, credentials, and jobs available to similarly talented men" (Harding, 1986, p.21).

In addition to this, they investigated the psychological and social devices which *informally* maintained these discriminatory measures against women, despite the *formal* barriers being removed. For example, anti-discrimination laws may have been put into place, but individual instances of biased hiring practices and restricted vertical mobility in the work place (Reskin, 1978) continued despite its illegality. Some of the recent feminist research on the rhetoric of science has investigated these systemic issues in biology/psychoanalysis (e.g. Birke, L., 2000), anthropology and bioethics (e.g. Karkazis, K., 2008), cognitive sociology (e.g. Freidman, A., 2013), neuroscience (e.g. Fine, C., 2010, 2017), and intersex clinical reforms (e.g. Dreger, A., 2015), to name a few.

Feminists also paved the way for the questioning of sex development and associated gendered behaviors. At the heart of this issue was the foundational work of sexologists John Money and Anke Ehrhardt (1972) who posited that gender was the embodiment of a psychological process where internal convictions of the *self* were expressed, and sex was solely made up of physical attributes – both anatomically and psychologically determined

(Fausto-Sterling, 2000). Their research opened the door to the notion that sex was a biological *fact* and it was the root *cause* of all behavioral differences between males and females (Fausto-Sterling, 2000). Two researchers at the time stood out in opposition of Money and Ehrhardt's claims, social psychologist Suzanne J. Kessler and Wendy McKenna (1978).

They pioneered the application of ethnomethodology to gender and sex, taking into consideration intersexed individuals and the way their existence confounded previously held beliefs that sex was dichotomous. Kessler and McKenna's notions of "gender attribution" preceded both Zimmerman and West's (1987) "doing gender" and Butler's (1990) "gender performativity." This critical scholarship paved the way for further studies critiquing taken-for-granted notions of biological sex and gender, much of which was predicated on the personal stories and medical histories of intersexed and transgender individuals (see Burke, 1996; Dreger, 1998; Feinberg, 1996; Hausman, 1992, 1995; Rothblatt, 1995) – with the exception of Haraway (1989) who drew from the scientific work on primates to critique beliefs on sexed behaviors.

Furthermore, the rhetoric of genetic science combined elements of feminist and traditional research on rhetoric of science. Approaches vary from quantitative accounts and critical interpretations of the meaning of genetic science in public discourse (e.g. Condit, 1999) to challenging the revolutionary positioning of genetic science in popular discourse as the key to understanding all human behavior (e.g. Kaplan & Rogers, 2003) to considerations of "biomedical discourse as political" (Happe, 2013, p.xiv). The majority of these texts mentioned here do not appear in academic publications, and consequently embody elements more closely related to the genre of "popularization."

Rhetoricians of science (see Dowdey, 1987; Dubois, 1986; Fahnestock, 1986, 2004; Hornig, 1990; Lievrouw, 1990; Rowan, 1989) provided guidelines for understanding the various shifts that take place in technical discourse when translated for non-expert audiences. In the following section I discuss key differences between popularizations, scientific papers, and book-length scholarly essays, highlighting the distinguishing features and illustrating how they contribute not only to the importance of the new genre but to establishing *Sexing the Body* as an important artifact for analysis.

POPULARIZATIONS VS. RESEARCH ARTICLES

In Jeanne Fahnestock's (1986) formative work, "Accommodating science: The rhetorical life of scientific facts," the process of writing *about* science is differentiated from writing *in* science, an activity termed "science accommodation." She noted that there "was a wonderful proliferation of book-length translations of science" where scientists, like Carl Sagan and others, had "discovered a public voice" (p.277), but that there lacked any study of them from a rhetorician's perspective. Through her research, Fahnestock (1986) identified a few key elements that identify them as a genre unto their own. First, drawing from the results of her study of *Nature* and *Science – Science82, Science83, Science84 and Science85* – magazine, she noted that popularizations differ from scientific papers in that they are epideictic in purpose, meant "to celebrate rather than validate" (p.279).

By contrast, scientific papers are more closely related to forensic types of speech in that they are devoted to validation, to "arguing for the occurrence of a past fact..." (Fahnestock, 1986, p.278). This can be understood as having a relationship to "readership." The epideictic purpose of popularizations led their writers to use appeals to

the audience's values, advancing the 'the wonder' and 'the application' (Fahnestock, 1986, p.279), in order to assure significance – something that is assumed by the audience of scientific papers. Additionally, as popularizations are intended for an overwhelmingly different audience than their counterpart, the information is changed in its representation while appealing “to readers who are not apiologists [sic] or even specialists in any life science” (Fahnestock, 1986, p.280). This happens for two reasons. First, a non-expert audience is understood to not speak in the highly-technical vernacular of scientific papers, so writers adapt using lay terminology.

Second, appealing to the audience's need/desire for simplified arguments (Fahnestock, 1986), more assured positions are advanced. For example, some changes may include the use of “intensifying phrases...claims of rarity and exaggerations... [or] assertion[s] that it is ‘the first’ of its kind...[to] argue for its significance and value” (Fahnestock, 1986, p.282). That is, the often heavily qualified and hedged results of scientific papers are represented with greater certainty when adapted for less knowledgeable audiences. Third, borrowing from the taxonomy of statement types developed by sociologists Bruno Latour and Stephen Woolgar (1979), Fahnestock (1986) noted that popularizations tended to operate in the level four to five range, meaning the most certain and uncontroversial positioning of information. In contrast, scientific papers stay within level one and two, which is the most heavily qualified and openly speculative.

BOOK-LENGTH SCHOLARLY ESSAYS

In genre, Fausto-Sterling's, *Sexing the Body*, is neither academic journal article nor scientific accommodation. It is a hybrid of both – a “book-length scholarly essay” (heretofore referred to as BLSEs) (Varghese & Abraham, 2004). In a study conducted in

2004, Varghese and Abraham argued three key features that define BLSEs in contrast to scientific papers or popularizations: the author's rhetorical purpose, audience, and strategy. First, the author's rhetorical purpose is defined as a commitment "to two kinds of inquiry – the first philosophical and a second that is theoretical... writ[ing] to engage in public discourse that links their research explicitly with broader human concerns" (p.231). Fausto-Sterling does this as she joins her work on intersexed bodies to the greater concerns for patient welfare and safety.

For example, she holds issues about the medical management of individuals with androgen insensitivity syndrome (AIS) in conversation with the severe health risks associated with common treatments paths. She states that there are "dangers of developing osteoporosis" (65) associated with artificially induced feminization – a repercussion of early removal of testis of XX intersex children. Additionally, she expands her theory on the numerous variations of sex development to imagine how it might impact the current sociopolitical climate surrounding gender. She offers an ethical perspective along with each of her examinations, most explicit when considering the numerous negative repercussions of current medical interventions of intersexed individuals.

Next, the intended audience of BLSEs is unique as it engages a dual audience – both popular and specialized audiences. Varghese et al (2004) stated that authors of BLSEs "explicitly build a dialogue with their readers... addressing a lay audience... [but] also speak at length about intending their work to be worthy of consideration by a jury of their peers (p.208-209). Fausto-Sterling (2000) explicitly opens her book by noting how its construction is intended to foster this balance. She stated, "...I have written two books

in one: a narrative accessible to a general audience and a scholarly work intended to advance discussion and arguments within academic circles” (p.iv). She acknowledged that because academics demand detailed evidence, which can pull attention away from the general argument, she created the second book in the notes section so as to not distract from the main narrative. This includes “detailed evidence in the form of quotes from original sources or detailed accounts of a particular experiment” (p.iv). However, she goes on to encourage everyone to read the notes, including the general readers, owing to its depth and diversity it adds to the text.

Lastly, the author’s strategy, or “generic structure,” is one which accomplishes three aims lending credibility to BLSEs in the scientific enterprise. First, the rhetorical moves “explicitly mark the...intention of...academics to pursue a synthesis and reformulation of knowledge that crosses disciplinary boundaries – a disciplinary synthesis that clearly could not be achieved through a dilution of the subject as found in popularizations (Varghese et al, 2004, p.218). Second, the chapter bodies are not narrative, “but argument, built step-by-step, as each hypothesis considered for belief is rigorously and systematically tested, based on empirical evidence” (Varghese et al, 2004, p.219).

Third, they strike a cautionary note, making sure to not overemphasize the certainty of claims advanced. Fausto-Sterling achieves these three measures of the last feature, as she builds properly qualified, yet empirically-backed arguments, crossing over disciplines within the natural sciences. For example, in chapter 7, she builds a case (argument-style) against the concept of “sex hormones” in favor of “growth hormones,” engaging the eleven different branches of sex hormone research (cross-discipline synthesis), providing

detailed accounts of their issue-laden results, culminating in a discussion about the tenuous relationship between sex and gender and the reservations she holds that knowledge correlates to change (qualified) (Fausto-Sterling, 2000, p.170-194).

The influence that scientific information has on public opinion, as expressed by Stewart (2009) and Fahnestock (2004), illustrates the need to employ the best model – the BLSE – toward a solution to the moral problem of its translation. Each of these respective endeavors contributed to the work of Fausto-Sterling in *Sexing the Body*, being equal parts rhetorical and feminist analysis of scientific discourse in a hybrid genre. As she draws from each field of study, her argument takes on the persuasive tactics of socially-constructed scientific knowledges, viewing the results through a critical lens to highlight the gendered nature of sex assignment.

As an end to this review, it behooves me to mention the BLSE's utility specifically for feminist aims. Fahnestock (1986) noted that the translation of scientific information was a moral problem, especially when considering its application to the research on gender, and the consequences of its misunderstanding can be serious and lasting. The gendered history of Science and the issues with its popular adaptations have provided evidence that we need a model for reliable, and widely disseminated, progressive perspectives on gender and sex. Fausto-Sterling, specifically in *Sexing the Body*, used the BLSE model as a tool for addressing a dual audience - speaking to the public as a scientist and to scientists as a feminist - bringing the issues associated with sex development and assignment to the public and advancing a radical feminist perspective in expert circles.

This points to the significance of *Sexing the Body* as an artifact. In the forthcoming analysis and discussion, I demonstrate how it avoids the prime drawbacks found in popularizations, retaining the integrity of the arguments between sources and exemplifying the rigorous standards expected of and by experts; how it contributes valuable insights by proposing and exploring new theories on sex and gender; and illustrates the utility of the BLSE for advancing philosophies in connection with broader cultural concerns. The arguments made about sex development and assignment in *Sexing the Body* offer radical revisions to biological determinism and essentialism, which has the potential to influence public and scholarly discourse (which I have argued to be affirmative).

CHAPTER 3: METHOD

METHOD OF INQUIRY

Critical Discourse Analysis

In this section, I demonstrate how critical discourse analysis (CDA) can be used to highlight rhetorical and discursive features of translations of scientific information found in BLSEs. Fairclough's (1992) approach to critical discourse analysis "offers rhetoricians another critical social science perspective ... that attends specifically to language use at different levels and to its strategic and ideological functions" (Stewart, 2009). The first *text* layer pertains to "vocabulary, grammar, cohesion, and text structure" (p. 75). The layer of *discursive practice* "involves processes of text production, distribution, and consumption, and the nature of these processes varies between different types of discourse according to social factors" (p. 78). Lastly, the *social practice* layer is concerned with ideology – "significations/constructions of reality" (p.87) – and

hegemony – leadership and “domination across the economic, political, cultural and ideological domains of a society...” (p. 92) – “as a way of theorizing change in relation to the evolution of power relations...” (p. 92) Specifically, it focuses on power relations as a way of “seeing [discourse] as contributing to and being shaped by wider process of change” (p. 92).

The first and third layer are of particular importance to this study as they relate to my research questions. They provide a means through which to analyze and understand the (re)structuring and (re)articulation of scientific discourse in texts outside of their respective publications. Greg Myers (2003) stated that “the popularization of science is an unusual field for discourse analysis, because the scope of the field is defined in terms of what it is not...include[ing] only texts about science that are not addressed to other specialist scientists...” (265). That is, when studying certain modes of discourse – like law, education, religion, etc. – we expect researchers to analyze the texts of those disciplines. However, in the case of popularizations, by genre, researchers address not the scientific discourses, but *only* their translations intended for lay audiences. As a hybrid genre, BLSEs provide an opportunity to apply CDA of popularizations a step further, incorporating discourse intended for expert and lay audience, where measures are taken to engage each group.

The Toulmin Model

In my study, I operate CDA in a comparative argument inquiry between original scientific/scholarly texts and their translation into the genre of BLSE. Specifically, I analyze *Sexing the Body* as an artifact, identifying the arguments that approached the genetics-based theories for sex development and assignment. As I apply CDA to *Sexing*

the Body, I look to the Toulmin (1958) model to organize the arguments in a way that allowed for a side-by-side comparison and critique. Toulmin described arguments as “organisms” with anatomical and psychological structures, the former containing “organs” (p.87). The macro level, the gross anatomical structure, is often lengthier where main phases can be distinguished.

The micro, psychological level is finer, composed of individual sentences, and here we find the logical connections introduced and validity established (p.87). Within the micro, psychological phase, there are two triads that constitute the basic elements of argument: first, the author’s explicit appeal, final proposition, or conclusion (claim), the data, and the “logic” that connects these two elements (warrant) – warrants are often implicit rather than explicitly stated; and, the certifying credentials of the warrant (backing), any conditional element of the claim (rebuttal), and the level of certainty expressed about the quality of the argument (qualifier) (Brockriede and Ehninger, 2009).

This analytic approach is key for my study in that it allows me to structure rhetorical arguments for analysis and criticism, tracing the integrity of the arguments from their technical sources to Fausto-Sterling’s translation. Here, integrity is used to define the preservation of the argument at its core, where overall claims are consistent between their two iterations. First, this method structures a model of argument that is *dynamic*, “emphasizing the *movement* from data, through warrant, to claim,” terminology which constructs a view of arguments as “‘working’ to establish and certify claims...understand[ing] the role each part of an argument plays in this process” (Brockriede et al, 2009, p. 47) (emphasis in original). Second, a “working” theory of argument enables the identification of its parts that have remained intact and those that

have been altered in translation – like a shift in warrant, a different claim, or differing data used as proof. An argument that retained its reliability in translation would function like a parallel case in which the claim would affirm what was already accepted in the original argument.

The Toulmin Model proves useful adapted as an analytical tool to the framework of CDA. It allows us to move “from phrase by phrase arguments towards texts in context...” (Molina, 2013, p. 212), exposing “how various ideologies are expressed in the structure of arguments” (Khoirunisa & Indah, 2017, p. 155). In other words, through the systematic ordering of discourse, argument strategies can be identified and used to illustrate the author’s implicit values and beliefs. When applied to the translation of scientific/academic discourses, the Toulmin Model and CDA operate cooperatively to assist the analysis of translation schemes and for discerning the motivations expressed through those decisions.

IDENTIFYING ARGUMENTS FOR ANALYSIS

The following section explicates my method and rationale for selecting particular arguments from *Sexing the Body*. Stemming from my assertion of the book’s significance for its radical position on sex, I located and selected only arguments which pertained to genetics/genomics, biological sex, and gender. To do so, I had four steps. First, I started with the Table of Contents, where I looked for titles that sounded related to my research agenda. Next, I went through each chapter’s subsection headings, looking for similar thematic elements. Third, I then went through the index, first looking for my identified keywords (genes/XX/XY/AIS/chromosomes/genetics/biological sex/gender), then authors’ names of whom I knew to be researchers within the field of sex and genetics.

Fourth, and finally, I scanned the index in its entirety to discover any alternative terminology that related to my interest. Once I had established every instance I could find where the author briefly mentioned, or discussed in-depth, any of my keywords, I identified the citation that correlated with it. This supplied me with either a notation expanding on the conversation or provided me a cited author. At a certain point, I realized that it was going to be necessary to treat the notes section as an accompanying text. I scanned the entirety of it, looking for authors, keywords, and discussion points that related to my research interests. This process gave me the sets of arguments needed to proceed to the analysis. In the following section, I investigate Fausto-Sterling's strategies in relation to those outlined in CDA, applying the BLSE scheme to her rhetorical movements, and confer the results in conversation with my research questions. I follow this with a discussion of the limitations of my study and a proposition for future research.

CHAPTER 4: ANALYSIS

Fausto-Sterling took up the work of previous scholars who questioned various aspects of sex development and assignment, both in academic and scientific fields. Her book, *Sexing the Body* (2000) is a thorough dissection of the vast and varied histories of sex determination, and it functions as two separate texts. The first half of the book is intended for a general audience, while the second half is a means "to advance discussion and arguments within academic circles" (Fausto-Sterling, 2000, p.vi). I focused on the first section of the book, that which she stated was intended for a general audience, to find what arguments were being made and which authors were cited whenever discussing genetic-based explanations for sex development and assignment. Guided by my three research questions, I identify how Fausto-Sterling translated technical arguments for a

popular audience, how they vary from (or are similar to) their technical origins, and what ideological work is evident in the translation. Based on the proposed significance of this text as a radical feminist/scientific piece of literature, I also consider the radical position being advanced by the questioning of sex as a privileged, or viable, category of identification as it differs from the scholars whom she cites.

The forthcoming analysis is sectioned into two related categories in which arguments for genetics-based sex development and assignment were made: arguments concerning phenotype (the physical expression of genes on the body), and arguments regarding social meaning (cultural interpretation of phenotype). For discussions about phenotype, Fausto-Sterling cited Dreger (1998), and Kessler (1990, 1998). When discussing social meaning she cited Kessler and McKenna (1978), Kessler (1990, 1998), and Judith Butler (1993). Numerous arguments were made that dealt with sex development and assignment being correlated with the physical expression of chromosomes on the body (phenotype) – whether that be the development of certain or varied internal sex organs and/or external genitalia – but only two of those arguments occurred in the first half of the book. I did not include “further reviews” or added arguments that occurred in the notes as they were intended for academic/scientific circles, which puts them beyond the scope of my study.

The two arguments related to phenotype occurred in two contexts: a discussion of classification/codification for hermaphrodites; and, the medical management of intersexed infants. Five arguments were made which dealt with the social meanings attached to phenotypes of (inter)sexed individuals. There may have been more discussion about social meaning in the front half of the book owing that sex assignment by social

“interpretation” is the overall argument of her book (hence the name “construction of sexuality”). The five arguments regarding social meaning occurred in these specific contexts: the medical management of intersexed infants; the varying physical traits prioritized in sex/gender assignment; intersex surgical patients’ psychological health; genital and gender variability; and, the constitutive force of “social construction” for biological sex and gender.

PHENOTYPE

This argument came about in the second chapter, “The Sexe Which Prevaieth”, under the sub-header “The Making of a Modern Intersexual” (Fausto-Sterling, 2000, p.36). Fausto-Sterling discussed the steady elimination of the concept of “true hermaphrodite” (TH) in the late 19th century through ideas published by the German physician Theodor Albrecht Klebs. She cited the research of Alice Dreger (1998), as she wrote about the evolution of TH classification in France and Britain. Dreger endeavored to understand “how medical and scientific men thought about hermaphroditism...to get a sense of how scientific theory influenced medical practice, and practice theory,” because when you “[f]igure out how someone organizes the world...you...understand how he sees the world” (p.141). Dreger believed that the organizational practices which illustrated an individual’s worldview were also the mechanism of reinforcement – what gained importance and what faded away. Breasts being made the primary trait marker of mammals was used as parallel to explain the medical and scientific decision for gonadal anatomy as trait marker of hermaphroditism.

She recounted the two phases that predated the age of gonads, that of France’s Isidore Geoffroy Saint-Hilaire and Britain’s Sir James Young Simpson. Geoffroy created

an analytic system of six “sex segments” – the profound portion, the middle portion, and the external portion – where all segments were taken together in comparison to determine femalehood or malehood, and of which would result in two classes of hermaphroditism. In Simpson’s article, “Hermaphroditism, or Hermaphrodism” published in *Cyclopaedia of Anatomy and Physiology*, the classification system “simply... group[ed] types of hermaphroditism into readily comprehended categories,” (Dreger 1998, p.143) dividing them into two orders, spurious and true. In other words, measures for “true” hermaphroditism were fairly broad, and multiple combination types were included in the categories.

She documented the transition from Simpson’s inclusive system to that of Klebs, which significantly altered and complicated the criteria for TH classification. This transition, she stated, was the catalyst for the phasing out of TH’s from medical journals; not because they stopped being born, but because scientific methods were classifying them out of existence (CLAIM). She used Kleb’s own work (DATA), to illustrate how the classification system strictly narrowed to the “explicit use of the gonads as the sole markers of true sex” (p.146). Klebs’s system, for example, would classify an entirely internally feminine being as male for having testicles, and likewise, would classify a masculine being as female for having ovaries. For example, one individual – Maria Arsano – previously identified as TH, was reclassified under Klebs’s system as “masculine *pseudohermaphrodite*” (emphasis in original) (p.145). In sum, Dreger posited where many beings would previously qualify as TH, the subdivisions under true and false hermaphroditism had become so complex that “significantly fewer people counted as ‘truly’ both male and female...the trend toward elimination of TH in humans” (p.146).

Fausto-Sterling (2000) took up this argument in “The Making of the Modern Intersexual,” also tracking the progression from Saint-Hilaire and Simpson’s systems to Klebs’s; however, she has a different take on the previous researchers’ systems. In the context of the argument, Fausto-Sterling is not as forgiving of Geoffroy’s and Simpson’s practice classifying sex and declaring bodies as abnormal, in need of correction. She declared their endeavors as aiding “[t]he hermaphrodite vanishing act” (p.37). She affirmed that the emerging science of biology, that which gained authority over ambiguous bodies and reorganized science’s notions of sexual difference, was responsible for future negative social implications, the management of those bodies as unhealthy and in need of treatment. She even went so far as to compare Simpson’s system to Klebs’s. She says, “Like Simpson, Klebs contrasted ‘true’ with what he called ‘pseudo’ – hermaphrodites” (p.38). This dichotomy of either/or is something Fausto-Sterling critiqued, where Dreger took issue with the transition to the gonad-focused system. In sum, Dreger’s conclusion was that Klebs’s system was phasing out TH’s, and she used the increased criteria as data, linking the two through the position that the focus on gonads was far too limiting as a baseline. Fausto-Sterling concluded that TH’s were being phased out, using the system specifics as data, but linked the two with the position that the new science of sex classification, advanced by Geoffroy, Simpson, and Klebs, was equally implicated in preordaining the negative consequence.

While contesting intersexed healthcare professionals’ commitment to the bioethical principle “first, do no harm,” Fausto-Sterling breathed life into the debate using personal testimony of individuals who experienced having multiple “corrective” surgeries. In chapter four, “Should There Be Only Two Sexes?” under the subheading

“Right to Refuse,” she avowed, “Dogma has it that without medical care, especially early surgical intervention, [the intersexed] are doomed to a life of misery. Yet there are few empirical investigations to back up this claim. In fact, the studies gathered to build a case for medical treatment often do just the opposite” (p.93). She noted here that Kessler’s 1990 study, “The Medical Construction of Gender: Case Management of Intersexed Infants” published in *Signs*, is cited.

In this article, Kessler chronicled the management of intersex infant cases as proposed by John Money, J. G. Hampson, and J. L. Hampson in 1955 and further developed by John Money and Anke A. Ehrhardt in 1972. Since the entire article is cited, I reviewed each segment to find potentially related quotes which fit best with the conversation in which it was cited. In the section, “The theory of intersexuality management,” Kessler responded to some of the conditions noted by Money et al which were claimed to be a result of the non-surgical-treatment of intersex infants. Kessler stated, “...although there are life-threatening aspects to some of these conditions, having ambiguous genitals per se is not harmful to the infant’s health” (p.5) (CLAIM). Kessler backed her position (DATA) stating that the evidence for such an assertion was not only limited in quantity, but also all coming from the same researcher, John Money. The warrant is implied, where, in science, volume and variety are both chiefly important to be able to qualify any research as having scientific merit.

Fausto-Sterling’s claim concerned *evidence* in two ways – the lack of empirical evidence to support dogma, and the evidence which contradicts the claim – and Kessler’s claim was an assertion about the evidence, that not all *conditions* which result in ambiguous genitalia are life-threatening. In other works, both authors claimed something

about evidence, the former regarded the evidence as limited and contradictory, while the latter considered it limited and inaccurate. Fausto-Sterling cited Kessler's work as her data, as well as three accounts which contradicted the evidence for early intervention: the story of intersexed citizen Francis Benton (see Young, 1937, p.146), German physician Claus Overzier, and adamant early-interventionists Dewhurst and Gordon (see Dewhurst and Gordon, 1963, p.77). She stated that each confirmed the greater success had with sex assignment postponed until later in life (or no intervention at all (Benton)), as opposed to surgical intervention as an infant. In other words, where Kessler used evidence from research from Money et al as data, Fausto-Sterling used, and endorsed, anecdotal evidence, the work already conducted by researchers who came before.

As previously stated, Kessler's backing regarded the limited number of studies and reports that confirm adverse health effects caused by certain conditions related to ambiguous genitalia. She stated, "[s]upportive evidence for Money and Ehrhardt's theory is based on only a handful of repeatedly cited cases...[and] [a]lmost all of the published literature on intersexed infant case management has been written or cowritten by one researcher, John Money..." (p.7). As further backing, she provided an example of a physician who has extensive experience with intersex infant management, raised differently in a nonindustrialized culture, where there is no harm documented for gender development. In other words, her evidence was that there isn't a sufficient diversity of studies to merit the level of concern and interventions being advocated, and furthermore, contradictory studies exist. Where Kessler used the medical research of Money et al as data to back her claim, Fausto-Sterling used anecdotal evidence to do so. Fausto-Sterling's underlying logic is that further research on the topic of intersex infant health

isn't necessary as there is ample evidence in the work of previous researchers like Kessler.

SOCIAL MEANING

It is now obvious that one of the most significant arguments for genetics in establishing biological sex are through its explanatory role for genital development and configuration. However, as discussed in the literature review, Science is an interpretive act. Intersex individuals are a primary example of such interpretation, especially when it concerns post-birth decisions about sex assignment. In chapter four, "Should There Be Only Two Sexes?" under the subheading "Right to Refuse," Fausto-Sterling tackled this issue of the medical management of intersexed infants. She offered a story of Helena Harmon Smith, who, in the 1990s, was faced with the decision to alter her child born with both an ovary and a testis. Doctors favored surgical alteration to create a boy, however she refused on the grounds that her child was already "beautiful" and "had parts [she] didn't have" (p.92). The doctors ignored her decision and removed the child's gonads without her consent, which led Harmon-Smith to become an activist, founding the "Hermaphrodite Education and Listening Post (HELP)" (p.92). She published a set of instructions intended for when physicians encounter children like her own: no drastic decision before the first year; families cannot be quarantined from support and information; and, patients to be allowed the right to stay on the common ward (in lieu isolation in the intensive care unit). Here, Fausto-Sterling cited the work of Kessler (1998) which was used to mirror Harmon-Smith's sentiment.

The original text is a lengthy script proposed by Kessler (1998) in Chapter six, "Rethinking Genitals and Gender," in the subsection, "The Future of Intersexed," and I

believe it is important to relay it in its entirety. However, first, let me offer the context in which it occurred. While discussing the current state of the medical management of intersexed children, Kessler focused on the (re)interpretation of “the meaning of genitals” (p.125). Her concern, in part, was about how to get parents comfortable with their intersex children – how to present “larger-than-typical clitorises, absent vaginas, smaller-than-typical penises, off-center urinary openings, and irregularly shaped scrota and labia ...[as] acceptable markers of gender...” (p.128). Additionally, Obstetricians (OBs) were said to have often mishandled the post-birth interaction with parents, so Kessler noted a more sensitive approach that had been suggested by a psychiatrist in the field of intersexuality. To paraphrase the model conversation, an OB would postpone answering questions about the child’s determined “sex,” saying only “we will have to do some test” (p.128) and would defer to the doctor once they arrived.

Although the suggested model for OBs was an improvement, Kessler wondered, what about doctors? She said, “*Imagine* this script for a physician who is explaining the birth of a girl whose clitoris has been affected by congenital adrenal hyperplasia:

“You have a beautiful baby girl. The size of her clitoris and her fused labia provided us with a clue to an underlying medical problem that we might need to treat. Although her clitoris is on the large size it is definitely a clitoris. *Who knows what it’ll look like as she grows! Some parents don’t have a realistic sense of what a baby’s genitals look like. You probably haven’t seen that many, but I have. I’ll consult an endocrinologist, but we won’t need a surgeon since there’s nothing we need to do about the clitoris.* The important thing about a clitoris is how it functions, now how it looks. She’s lucky. Her sexual partners will find it easy to locate her clitoris. *She doesn’t have a complete vagina now and she can decide whether she wants one constructed when she’s older. Surgical techniques will be more advanced then and her grown body will tolerate the surgery better, if she chooses to have it”* (p.128-129). (my emphasis).

The following selection is the citation in full as it appears in Fausto-Sterling’s book:

“Kessler *suggests* a new script to be used in announcing the birth of an XX child affected by CAH: Congratulations. ‘You have a beautiful baby girl. The size of her

clitoris and her fused labia provided us with a clue to an underlying medical problem that we might need to treat. Although her clitoris is on the large size it is definitely a clitoris... The important thing about a clitoris is how it functions, not how it looks. She's lucky. Her sexual partners will find it easy to locate her clitoris" (p.92). (my emphasis)

There are two key differences in Fausto-Sterling's translation, outside of it merely missing portions. First, notice that Fausto-Sterling said Kessler "suggested" the use of the script. In the context where we find Kessler's script, she is not suggesting its use, but offering it to her readers to illustrate an alternative to the current practice, which would expand the possibility for genital normalcy. Second, Kessler's openness to surgery as medical necessity is evident in the last section left off of Fausto-Sterling's passage. Kessler gave the impression that she may yet believe that gender is something worth constructing, as long as it's the patient's decision. All of this would lead to, what Kessler refers to as, a "treatment (r)evolution" (p.129). By leaving out the last two sentences, Fausto-Sterling erased the qualifier that surgery may be an option and might be ok. Considering the other instances where Fausto-Sterling has suggested a future where gender identity is irrelevant, this elimination comes across as ideologically-fueled, and manipulated in the service of her ultimate utopia.

In chapter three, "Gender and Genitals," under the section titled, "The Surgical Fix," Fausto-Sterling tackled the issue of cultural interpretation. Rules for determining "nature's intention" for intersexed infants were, in part, developed by esteemed embryologist and researcher Dr. Patricia Donahoe, the Professor of Surgery at Harvard Medical School (HMS). First, a child with XX chromosomes (chromatin-positive) and symmetrically placed gonads is defined as female pseudo-hermaphrodite. Second, a chromatin-positive child with asymmetrical gonads (testis on one side and an ovary on

the other) is defined as true hermaphrodite. Third, chromosome-negative (one X chromosome) with symmetrical gonads would be defined as male pseudo-hermaphrodite. Finally, chromosome-negative with asymmetrical gonads would be defined as mixed-gonadal dysgenesis, “a catchall category containing individuals whose potentially male gonads have some form of abnormal development” (p.57). In sum, the symmetry of gonads and presence or absence of a second X chromosome serve as a speedy determination method for physicians faced with intersexed infants, and this series of stages is viewed as biologically-sourced.

However, Fausto-Sterling argued that the decision to “call a child a boy or a girl...employs social definitions of the essential components of gender” (p.58) and these “definitions...are primarily cultural, not biological” (p.58). For example, children born XX intersex with congenital adrenal hyperplasia (CAH) – “a genetically inherited malfunction of the enzymes that aid in making steroid hormones” (p.58) – are treated differently in Europe and America than in Saudi Arabia. In Europe and America, XX intersex children with masculinized genitalia would be raised as girls owing to their potential for childbearing; however, in Saudi Arabia, the same children would be raised as boys owing to the cultural preference for males. She continued, noting that cultural preference for females was even more “tangled in social definitions of gender” (p.59). That is, no matter what internal and external organs the intersexed infants appeared to have, parents’ (cultural) preferences play a key role in assigning a child’s sex.

Fausto-Sterling added, decisions for early genital surgery also have psychological goals. Intersex males and females are assigned their “true sex” via distinct criteria: males, despite potential infertility, have rules that relate to the organ’s physical appearance (does

it look normal to other boys) and its performance (can it do satisfactory work in intercourse); females, on the other hand, are assigned their sex *solely* based on reproductive capability. Fausto-Sterling said, “Doctors often follow Donahoe’s rule that reproductive function be preserved...” (p.59). However, there are cases where this reasoning was disregarded – penis structure was retained over reproductive capability. Fausto-Sterling cited Kessler’s (1990) article where she reported “one case of a physician choosing to reassign as male a potentially reproductive genetic female infant rather than remove a well-formed penis” (p.59). That is, when, per the psychological rules of “femaleness,” an intersex child would have been assigned as female, the appearance and relatively intact function of a penis took precedence toward a male assignment.

Where Fausto-Sterling cited Kessler’s (1990) entire article, the most closely related section to her purpose was “Social factors in decision making,” which discussed a few examples of the social factors in sex assignment of intersexed infants. Kessler, citing John Money, explained that the requirements for male assignment adhere strictly to look and function. However, Money denoted an exception where even a perfectly formed penis would not merit reassignment to male if it was not of the “same caliber as that of same-aged males with small-average penises” (p.18). Additionally, citing a 1968 study by Money, Kessler noted that an XX intersex child with masculinized genitalia would not be recommended reassignment as female anticipating the parents’ reaction to “seeing ‘their apparent son lose his penis’” (p.19). She went on to say that Money stated his opposition to “neonatally amputating the penis of XX infants, since fetal masculinization of brain structures would predispose them ‘almost invariably [to] develop behaviorally as tomboys, even when reared as girls’” (p.19). She noted that, for Money and others,

ultimately, the morally-conscious criteria for justifying surgery on intersexed infants is, a) look, and b) function. So, the rules are unstable at best. Assigning an intersexed infant as male should never happen unless the perfectly formed penis is of equal caliber to other males, and female assignment and reproductivity shouldn't be if, a) penis removal would (potentially) shock the parents, or b) lead to tomboy behavioral development in a female assigned child.

Kessler's claim was that decisions to assign intersexed infants as male or female are based in shared cultural values. Her evidence is that there are exceptions to every rule of assignment, from physicians' to parents' desires for the child, based on reproductive outcome, genital look and function, as well as behaviors linked to notions gender. However, the way Fausto-Sterling cited Kessler was not an identical translation. Fausto-Sterling claimed that Kessler had cited an instance where a physician had preserved male genitalia and assignment of an XX intersexed infant in lieu of female assignment despite childbearing capability. However, the pages she cited merely stated were Kessler had noted Money's opposition to certain measures being taken in particular contexts, not that he had refrained from the surgical procedures himself. Fausto-Sterling's claim is similar in that she argued sex determination as a social, not biological act; however, her evidence (Kessler's article) contained an inaccurate citation of the original text. Fausto-Sterling's data is also her qualifier, where female fertility usually predominates a physician's decision to assign sex, an exception was made to preserve the penis when it had familial and psychological implications.

Fausto-Sterling continued the conversation about "fixing intersexuals," and the cultural interference into apparently genetic-based sex development and assignment, in

the context of treatment protocols. In chapter three, “Gender and Genitals,” under the subsection “The Psychological Fix,” she noted that physicians describe their surgical decisions as being made in the best interest of the patient’s psychological health, and that this exposed some ideologies about gender at work. She stated that in intersex management, “. . .medical practitioners unintentionally reveal their anxieties that a full disclosure of the facts about intersex bodies would threaten individuals’ – and by extension society’s – adherence to a strict male-female model” (p.65). She was careful to note that she was not advocating a conspiracy, rather that doctors are hindered by logical binds owing to their deep-seated belief in binary sex/gender. Whether consciously or not, Fausto-Sterling noted the repercussions of when physicians decide to preserve this system at the expense of a patient’s long-term health (CLAIM). In AIS children, it is said that early removal of the testes is done owing that they can be cancerous, but this doesn’t occur at increased rates until post-puberty. Once the testes are removed, at puberty the individual will have to take female hormones; however, natural feminization at puberty would occur if the testes were preserved, as the androgen-insensitive body responds to testicular estrogen. This, as Fausto-Sterling stated, reduces the risk of osteoporosis brought on by artificially induced feminization, as well as the risks associated with genital surgeries on infants. In this example, the patient’s health was put at risk in order to preserve the notion of a two-sex system with accompanying genitals, which is framed as psychologically beneficial for the parent, and the child as they mature.

She proceeded to a later portion of that same essay by Kessler (1990), titled “Postinfancy case management,” for a particularly poignant example of such an instance. Fausto-Sterling noted the story of an AIS patient who, at twenty-three years old, was told

about a major ovarian removal surgery they had at birth (DATA). As a teen, they were instructed to take estrogen pills owing to their removal, and were informed that in lieu of having children, since their uterus wouldn't develop, they could instead adopt children. Fausto-Sterling wrote, "Another physician on the treatment team approved this explanation. 'He's stating the truth, and if you don't state the truth...then you're in trouble later.'" (p.66). She directly cited Kessler, saying "[g]iven that the girl never had a uterus or ovaries, however, this was... 'a strange version of 'the truth''" (p.66). In other words, doctors removed the child's testes at birth, which prevented the natural feminization that would have occurred at puberty, then when that time came instructed them to take estrogen pills because of a missing uterus, when a uterus was never present. Instead of telling the patient about their removed testes, they preserved the system in a lie and called it truth.

Kessler's account of postinfancy case management was primarily concerned with establishing the significant role of physicians in constructing gender, as parents "latch onto the assignment as the solution to the problem..." (p.21). She remarked that although the physicians she interviewed claimed the parents were equal participants, there were no instances given where participation was evident before gender was assigned. It was only afterward that parents were encouraged to "establish the credibility of that gender publicly by, for example, giving a detailed medical explanation to a leader in their community...who will explain the situation to curious casual acquaintances" (p.22). In other words, the parents functioned as a vehicle for the physicians' beliefs, fashioned in the operating room and disseminated into the social world.

Kessler's claim was that physicians are responsible for the creation of binary sex and gender in intersexed infants, and this role is potentially, and often, a risky one. The risk is established in two ways: one, doctors not only decide what internal and external sex organs will be kept or removed (recall the health hazards from the AIS story), but they also counsel parents in how to manage the child post-surgery (creating and sustaining gender norms), both on an individual level and in public; two, there is little coherence across the postinfancy gender-management process" (p.23). This failing was illustrated when she mentioned two other endocrinologists that she interviewed about the female-assigned XY child with AIS and said each provided a different alternative way they would have managed the interaction with the parents and, after puberty, the child. One would have used a different term – 'the gonads' – and the other would have said "that the uterus had never formed" (p.23), each substitute response a lie, as Kessler argued.

Her data was the testimony of the endocrinologists whom she interviewed, their stories corroborating all of these risks. Within her data was an explicit warrant, the physical and psychological risks to patients by lying about medical procedures. This was reason enough for physicians to be a focal point for changing the way we manage the intersexed at all stages of life. For both authors, the overall argument remains the same, that biological sex determination based on genetic development of genitals in children is primarily a cultural act, and that physicians play the biggest role in establishing and continuing notions of the "natural" body. The warrant is consistent between the two texts. They both reasoned that reassignment surgery was used, and surgeons told half-truths and outright lies to preserve "the greater good – keeping individual/concrete genders as clear

and uncontaminated as the notions of female and male are in the abstract” (Kessler, 1990, p.23), often at the expense of the patient’s immediate and/or long-term health.

In chapter four, “Should There Be Only Two Sexes?” under the subsection “Revisiting the Five Sexes,” Fausto-Sterling outlined the physical and psychological scarring that patients often experience when surgically altered, as well as both outcomes of those who are not. She argued that those who reasoned for upholding the status quo of intersexed management offered weak cases at best, citing eighteen publications in medical journals that highlighted the results of these surgical cases. She continued, explaining the “fork in the road” for the future of intersex management: “To the right we can walk toward reaffirmation of the naturalness of the number 2 [the binary] and continue to develop new medical technology, including gene ‘therapy’ and new prenatal interventions to ensure the birth of only two sexes. To the left, we can hike up the hill of natural and cultural variability” (p.101). In other words, we can either continue along the same path we’ve been on or we can entertain a new perspective. The goal is the total elimination of gender identity as a consequential aspect of personhood.

Fausto-Sterling took a hopeful stance, calling for the revolutionary acceptance of intersexed bodies for the benefit of all persons. She stated,

Imagine a future in which our knowledge of the body has led to resistance against medical surveillance, in which medical science has been placed at the service of gender variability, and gender have multiplied beyond currently fathomable limits. Suzanne Kessler suggests that ‘gender variability can...be seen...in a new way – as an expansion of what is meant by male and female.’ (p.101) (CLAIM).

Fausto-Sterling characterized a possible future where “concepts of masculinity and femininity might overlap so completely as to render the very notion of gender difference irrelevant” (p.101). She suggested that permissible gender roles are changing and the

boundaries between sex and gender are deteriorating, as evidenced by stay-at-home dads, female fighter pilots, both feminine lesbians and muscular and macho gays, and female-to-male/male-to-female trans individuals (DATA). The next step of intersexed inclusion, she argued, is a critical phase of getting to place where gender identity becomes unnecessary and/or inconsequential.

Kessler's version of this particular conversation, however, is notably different from how it appeared in Fausto-Sterling's book. The context in which she spoke was a proposition of two new ways physicians might *talk* about intersexuality in order to revolutionize thinking about gender. As new rhetoric is required each time a surgery is performed (penis, vagina, scrotum, labia, etc.), new rhetoric was also a starting point for moving forward (CLAIM). One, she stated that it could be confronted directly, where physicians and support groups work toward a similar goal – the denormalization of the “condition” of intersex and the acknowledgment of gender prejudices, exploring frequently unspoken concerns. Kessler believed that parents were ready to hear new explanations, new philosophies, about this issue, and that medical journals were silent on ‘the wide variety of (often positive) responses [from parents] to what one might see as a death sentence’” (p.130). In other words, reported outcomes were biased regarding parental responses to having intersexed children, and it favored the traumatic and tragic stories over the numerous affirming ones (DATA).

Two, Kessler also suggested that the issue could be dealt with indirectly. She noted that “physicians... shelter[ed] parents from intersexuality while believing in it themselves” (p.130) and that this is how the situation became, and continues to be, normalized. Instead, she proposed that intersexuality be bracketed from thought, leaving

physicians with only the physical genitals, which “might not even be noteworthy beyond their initial signal of an underlying medical condition” (p.130). This discursive element of intersexuality is key, she noted, because physicians often side step certain words owing to their emotional implication (BACKING). For example, as a rule, terms like hermaphrodite or intersex are never used by physicians in conversations with parents. With that in mind, she recommended that, instead of saying someone’s daughter had a masculinized clitoris or that she had male chromosomes, physicians used phrases like “larger than most” or “having XY chromosomes,” because “[c]osmetic issues are issues that lay persons can reasonably have an opinion about and disagree with surgeons about, but gender issues are not, or at least not yet” (p.131). In sum, physicians can either/both adopt a new way of discussing intersexed bodies with parents, and/or eliminate the identity of intersexed from decision-making processes when faced with atypical genitalia.

It is here where we find the quote used in Fausto-Sterling’s book. Kessler stated, “*Genital variability can continue to be seen as a condition to be remedied or in a new way – as an expansion of what is meant by female and male*” (p.131) (my emphasis). She continued, “Whether the meaning one imparts to genital variability reifies gender or trivializes it has important implications for gender and intersex management. We need to consider different possibilities about how to manage intersexuality, including the possibility of not managing it at all” (p.131). The next sentence Kessler added was critical to the argument. She noted, “The future of intersex is in some sense the future of gender” (p.131). This quote, in the way it appears in Kessler’s work, had a different tone and overall perspective about the issue at hand.

Notice one of the biggest differences is that Kessler used the term “genital” and not “gender” as the type of variability. The characteristic in question for Kessler is the use of genitals to determine intersexed identity. Additionally, she used gender and intersexed separately, suggesting that “in some sense” one is the future of the other. That is a key difference, and added qualifier, to the overall argument being made. As Fausto-Sterling changed the topic to “gender” variability she altered the claim. Additionally, where Kessler included that intersex could “continue to be seen as a condition to be remedied” she structured a conditional proposition, changing the frame of the statement from one of optimism, as in Fausto-Sterling’s version, to one that conveyed a challenge to the medical community.

The management of intersexed humans could be achieved by either A or B. Kessler is not, as Fausto-Sterling was, conveying a hopefulness about dissolving gender identity, she constructed a means to separate the connection of genitals to gender. Near the conclusion, Kessler argued that “[b]y subverting genital primacy, gender will be removed from the biological body and placed in the social-interactional one. Even if there are...two genders...how you ‘do’ [them]...would be open to interpretation” (p.132). In other words, not only does Fausto-Sterling’s interpretation combine two categories discussed separately in Kessler’s work (genitals and gender), it expanded the argument to a place Kessler did not go - the management of the intersexed from an optimism for gender-irrelevance.

Second, the context of the authors’ argument is different. Kessler was concerned with the communication between physicians and parents, stating “...parents of intersexed infants have the legal responsibility, but they take their cues from the medical

professionals, whose status permits them to define the ‘real’ view of intersexuality, relegating other views, like the political intersexuals’, to a fringe perspective” (p.131). She aimed to illustrate the elements required for a revolution in thinking and talking about gender, and placed responsibility in the hands of two players. Fausto-Sterling was expanding on Kessler’s work to propose the necessary elements for her “utopia,” where intersexed identities are not of consequence, because “[m]edical intervention aimed at synchronizing body image and gender identity would only rarely occur before the age of reason” (p.101).

At the end of Fausto-Sterling’s third chapter, in the section titled, “Wrap-Up: Reading Nature Is a Sociocultural Act,” she started by stating that the medical approaches to talking about and managing intersexed bodies provides a *literal* example of the “social construction” of physical, or material, bodies. As what has been discussed throughout this section of the analysis, Fausto-Sterling has claimed that no matter what, “[a]ll choices, whether to treat with chemicals, perform surgeries, or let genitally mixed bodies alone,” (p.75) are choices based on cultural preferences, and are not inherently biological decisions (CLAIM). This context served as the backdrop for her use of poststructuralist theorist, Judith Butler’s, *Bodies That Matter* (1993). Of all the arguments concerning genetics-based sex development and assignment sustained in *Sexing the Body*, this is by far the most complex regarding structure and application. Fausto-Sterling stated, “The feminist philosopher Judith Butler suggests that ‘bodies...only live within the productive constraints of certain highly gendered regulatory schemas’” (p.75) (DATA). For example, as Fausto-Sterling related, the regulations for being a (culturally intelligible) male and female are strict, primarily defined by genital appearance (“No oversized clits

or under-sized penises allowed” (p.75-76)) and behavior (“No masculine women or effeminate men need apply” (p.76)).

Butler’s (1993) original quote is situated within a complex conversation, one which grapples with the constitutive function of necessary, and preceding, (gendered) constructions of the body – those based on primary and indisputable experience. That is, if I may oversimplify, she questioned whether there is an “I” or “we” without certain constructions that tell us who “we” are, and these constructions are always already representations constrained by gender. To say it yet another way, the “facts” of our physicality can be thought of as separate, but they are equally irrefutable as the necessary affirmation of that physicality, or, *how* we understand and interpret the physical form and the meaning we give it. In this context, Judith Butler’s full passage reads as follows:

Thinking the body as constructed demands a rethinking of the meaning of constructed itself. And if certain constructions appear constitutive, that is, have this character of being that “without which” we could not think at all, we might suggest that bodies only appear, only endure, only live within the productive constraints of certain highly gendered regulatory schemas (p.xi).

So, where Butler can be said to be remarking on the psychological or cognitive act of “constructing” intelligible bodies – those that can be, as in this example, *understood* as either male or female and treated accordingly – Fausto-Sterling has used the notion of “construction” in a literal sense to help explain the social, or cognitive, role in constructing physical bodies.

At the most local level, intersexed bodies are surgically sculpted based on a model of preexisting gender schemas (i.e., the physicians’ deep-seated beliefs) and then managed within those same gendered schemas (i.e. – the parents’ and community’s participation). Fausto-Sterling’s claim can be seen as a literal representation, or perhaps

extension, of Butler's abstract theory. This is a clever, concrete application of a rather abstract theory, which critics often cite as immaterial for its seemingly lacking fitness for practical use. The two authors operate the theory in arguably different contexts, one in the intellectual realm the other in the real-world, but I believe the guiding principle, and claim, remains constant. Our realities, our perceptions, our knowledges are socially constructed, normalized through repetition until they acquire a "naturalized" sense of being. Biological sex and notions of gender are both socially constructed and deemed "natural."

The authors data are similar, even though distant in context. Butler used the intellectual "constructions," without which we could not function, as evidence of the social construction of our reality, and Fausto-Sterling used intersexed bodies that lay outside the culturally intelligible realm of acceptable bodies, ones we manage in order to fit a binary we deem solely appropriate. Butler's use of abstract evidence makes sense owing that her work is not, per se, rooted in the physical, but more the constitutive force of interpretations of the physical. Fausto-Sterling, having used most of her book to argue for the role the intersexed play in disrupting biological determinism and gender norms, logically used material bodies as evidence for social determinism's primary role in sex and gender assignment.

CHAPTER 5: DISCUSSION

DISCUSSION OF FINDINGS

In the above analysis, I moved through Anne Fausto-Sterling's (2000) critique of two categories used to secure the notion of genetics-based biological sex development and assignment, that of phenotype and social meaning. Phenotype is the physical

expression of a combination of interacting chromosomes and hormones, usually studied through internal and external sex organs. Social meaning denotes the cultural interpretation of the physical form of bodies, or materiality. Each section contained two to five unique scenarios, or contexts, wherein the arguments were reinterpreted by Fausto-Sterling. In each scenario, the author's argument was situated within a larger discussion about intersexed bodies and various aspects of their existence (i.e. – the doctor's method of deciding what sex to assign through surgery and hormone therapy, the parents' role in following the prescribed gender management, the repercussions of certain early surgeries on intersexed infants, etc.). In the following section, I will discuss the results of the argument analysis in each category and subsection in conversation with my three research questions: first, how does Fausto-Sterling translate technical arguments questioning biological sex for a popular audience? Second, how do these translations vary from their technical origins? Finally, what rhetorical and/or ideological work is accomplished by these translations? At the close of the discussion, I consider the limitations of my study and propose a future research trajectory.

In the first section, "Phenotype," I start with a selection by Alice Dreger where she discussed the history of categorization for hermaphrodites in her book, *Hermaphrodites and the Medical Invention of Sex* (1998). Fausto-Sterling and Dreger shared the claim that scientific methods were classifying "true" hermaphrodites out of existence. Fausto-Sterling, however, had a markedly different feeling about the evolution of the categories than did Dreger. They both used the three researchers' work as data, but where Dreger regarded two of the three players in this evolution with seeming indifference, Fausto-Sterling equated all three equally. She implicated each with

responsibility for limiting classification of hermaphrodites to a dichotomy of gonads and starting the medical phasing out of the existence of “true” hermaphrodites.

Although the resulting aspect of the data differs, Fausto-Sterling’s use of Dreger’s work fits with the understanding of advancing philosophies for popular audiences in BLSEs. The aim was to demonstrate, using Dreger as anecdotal evidence, that the use of gonads to determine biological sex was unstable and changeable, and therefore inadequate to call natural in any sense. However, she also advances a different viewpoint about the characterization of intersexed bodies by all three scientists through her position on their culpability for the harsh treatment of the intersex in medicine and society – an ideological move that separates her from Dreger in an important way. The larger claim is not altered in its translation, but the context into which it was transplanted differs critically considering her other contentions throughout the book.

The second argument regarding phenotype was concerned with the scientific dogma which would have us believe that if intersexed infants are not operated on they are destined to live awful lives in constant misery. Fausto-Sterling, again, used anecdotal evidence, but this time cited Suzanne Kessler (1990). Kessler’s claim was that, aside from the occasional health risk associated with certain conditions of intersex, having ambiguous genitalia was not life-threatening. She cited the research published by John Money, the sole researcher publishing on this matter, to warrant that insufficient evidence did not a diagnosis make. Fausto-Sterling’s use of Kessler’s work as data could be argued as an illustration of her views concerning research saturation. That is, she did not feel that *more* research was needed to prove the case against scientific dogma, but believed ample enough critique existed that it should be considered as sound and definitive. Again,

the use of anecdote as evidence served to support her argument against phenotype-based sex assignment, and the argument remained consistent between the original author and her interpretation. This is in line with the assertion that BLSEs uphold scholarly rigor and standards for evidence while remaining accessible to lay audiences

In the second section titled, “Social Meaning,” I began by discussing Fausto-Sterling’s argument that much of the notions we hold about gender stem from the way that physicians manage their engagements with parents of intersexed children. She cited a script offered by Kessler (1998) in which more sensitive language was used to relay the news to parents about their ambiguous children. There were key differences between Kessler’s and Fausto-Sterling’s version of the script. Fausto-Sterling stated that Kessler “suggested” its use and left out a large section of the full passage from her translation. Kessler, while presenting an alternative, said to “imagine” the script being used, which gives it a much different feel and context.

It was not prescribed as a cure for intersex-phobia of parents but used to illustrate other potential methods of approaching the issue to start changing their perceptions. The omitted section with the most significance came at the end where Kessler mentioned future surgery as an option if the child desired it later in life, while the context of Fausto-Sterling’s use would not allow for such a suggestion. This illuminates Fausto-Sterling’s ideological standpoint about future management paths for intersexed infants and advances her philosophy away from the pioneer in the field. Staying with the features of BLSE’s and the fostered space for theorizing alternatives to prior research, Fausto-Sterling uses Kessler as a jumping-off point to develop her ideas and argue for alternative measures.

Kessler's work challenged Fausto-Sterling in a pivotal way elsewhere in the book, but it did not fall into the purview of this analysis. Importantly, she ended up altering her position on that major issue in response – namely the tongue-in-cheek use of the terms hermaphrodite, mermaphrodite, and fermaphrodite (Fausto-Sterling, 1993) for varying intersexed body types. Therefore, I do not believe that Fausto-Sterling disagrees so much with Kessler that her use of the research could be considered cherry-picking on this particular subject. She yet managed to translate Kessler's work, despite its minor disagreements with her own, so that the overall message was preserved. The issues surrounding *talking* about hermaphrodites, or intersexed persons, using terminology which pre-genders them remained consistent in perspective in translation.

The second subsection covered Fausto-Sterling's use of Kessler's (1990) work regarding the social factors that affect physicians when deciding an intersexed infant's sex. Kessler noted that John Money, in his research, in one case had advised against reassigning a child female, despite having masculinized genitalia, because the cognitive link to genitalia would cause the reassigned girl to become a tomboy – an obviously terrible outcome in his expert opinion. Fausto-Sterling used this as anecdotal evidence (and qualifier) that while most often female fertility is preserved, if certain socially-undesirable traits would result, then exceptions are made. However, the evidence does not seem to be accurate.

Kessler did not claim that Money had opted against doing a surgery himself (preserving male genitalia in an XX child), but that Money merely would not recommend it. I do not know if this was a misreading of Kessler's work, as each individual interprets differently; however, it does, in this instance, weaken her argument since her data seems

to be false. I do not doubt that instances that prove her point have been published in other articles unrelated to John Money (I believe Fausto-Sterling even cited them earlier), but it is odd to use this example as proof when there may have been others more well-suited.

The next subsection was an analysis of an instance where Fausto-Sterling argued about the adverse health effects of early surgical intervention for intersexed infants. Taking from a later section of the same essay by Kessler (1990), she used testimonial evidence from Kessler as data. Kessler's interviews of endocrinologists and obstetricians produced an account of an AIS child who was lied to about a major surgery at infancy. The postinfancy management of the intersexed is claimed to be mishandled and inconsistent writ large, by Kessler, and Fausto-Sterling concurred. Again, the use of anecdotal data might suggest that Fausto-Sterling believed in the authority of Kessler's thorough research, and that she did not feel the need for *more* to be done for the sake of surplus. The warrant that patient health is the expense of retaining the status quo (clear social delineations of gender) is clear in both author's texts, so the translation holds its original structure.

The penultimate section revealed the most about Fausto-Sterling's ideological aims for her research and writing. She used Kessler's discussion of genital variability to expand her argument for optimistic engagement with a genderless future. Kessler suggested that different ways of talking about genital variability, for physicians particularly, might open up other possibilities for interpreting "doing" intersex. That is not the utopian idealism conveyed by Fausto-Sterling in her use of the passage. *Sexing the Body* approaches the future of biological sex from a different intellectual space, where the radical ideas of Kessler were pushed even further to imagine science-fiction as reality.

Where authors like Octavia Butler and Martine Rothblatt have stretched the imagination regarding similar topics, Fausto-Sterling appeared to be attempting a similar boundary-breaking, using the BLSE as a tool for advancing current gender theory. Kessler's approach was very practical, and it did well to provide a path for initiating change at its roots but considering the popular audience she intended to be addressing, Fausto-Sterling took up her instruction and pushed the theoretical boundaries to a more *radical* position.

Lastly, and arguably the most unique application of a citation, Fausto-Sterling looked to Judith Butler and her work *Bodies that Matter* (1993) to guide her argument about the social nature of sex assignment. Butler labored in the abstract realm of constitutive forces like social construction, careful to highlight that the term "construction" needed rethinking entirely. She meant that physical bodies do in fact exist, but that their affirmation, or cultural interpretation, is a construction. Fausto-Sterling concretized the abstract theory of social determinism, using intersexed bodies as the literal example of social constructions of sex. Although the data cited (Butler) was intended to challenge the notion that there are no social elements to observing a physical body, Fausto-Sterling took it up in a new way that challenged critics of poststructural thinking for its lack of practicality. Fausto-Sterling demonstrated that understanding the socially determined foundations of sex was paramount for challenging not only biological determinism, but science as a whole. This was an alteration, in a sense, of the original message, but for the argument and audience of the book, her ideological position is spotlighted.

In sum, Fausto-Sterling's translation of scientific/academic writing for a popular audience aligned with the results of Fahnestock's (1986, 2004) studies. The complex

terminology was altered for lay audiences, contexts were altered to advance the author's research agenda, and elements of the arguments were changed – some of the original hedges were removed, selections of writing were omitted, and alternative warrants were used to connect the data to the claim). However, the core of the arguments were preserved in integrity, providing a non-expert audience with reliable scientific information. Further, she illustrated the significance of the findings to the audience without overexaggerating its certainty. For instance, when discussing the need to change the way we understand sex and gender she noted that there is no assured correlation between altering scientific/popular discourse and social change. Lastly, her decision to retain and alter various aspects of the original arguments illuminates the ways her beliefs vary from those of the other authors. For example, through her discussion of hermaphrodites she illustrates her position that no classification system should have been created and that the desire to codify ambiguous bodies exemplifies the cultural belief in, and desire to maintain, a dichotomous biological sex.

The message of the book is one of extreme importance in our current cultural and political climate. Considering the moves being taken to restrict the rights of the LBGT community and women by the Trump administration, these claims are vital for reimagining the notions currently embraced about foundational differences between men and women. This, at minimum, is evidence enough that the work done in this book is special, worthy of study, and needs to be explored further. If we broaden the scope and think about the influence scientific popularizations have on lay audience, we can see the value of radical research like this for the masses. Having such weighted impact on public opinion, science and its accommodations may serve to begin the journey towards

important policy changes if used in conjunction with public education and voter encouragement. I, like Fausto-Sterling, may be measured as an idealist for believing that books can influence politics. However, current data on the successful persuasive influence of popularizations and research articles on expert and lay audiences suggests the potential for a similar effect from discourses successfully addressing a dual audience.

LIMITATIONS

This study had its limitations, especially owing to the strict parameters enacted in service of my arguments and research questions. First, since I was only concerned with the portion of the essay which was intended for a general audience, there were arguments that were not included, each regarding other aspects of genetics-based sex development and assignment. Second, and related to the third, owing that this is a solo work of its kind – academically rigorous, *radical* in its position on biological sex, and accessible to the public – the sample size is that of one. The analysis should be taken up with different parameters, focused outside of radical theories on sex (something broached by Varghese and Abraham, 2004). In order to make more general claims about the pedagogical utility and paradigmatic of genre of the book for scientific writing on sex (or any subject for that matter, to increase public and scholarly engagement) would require that the subject and style of this book be duplicated in large numbers by other scholars.

FUTURE RESEARCH

If this research were continued, I would remove the parameter which limited me to analyzing only the front-half of the essay. I believe that the author has produced a model for radical feminist writing about biological sex, and I think that there is much to be learned, and strides to be made, by incorporating all of the various arguments she

makes, injecting them deeper into the debate within academic, scientific, and public circles. Also, it would be advantageous to open up the analysis to all the arguments made regarding sex and its assignment, not just ones related to genetics. My interest narrowed my search, but it would be interesting to see how Fausto-Sterling translated, for example, arguments concerning neuroscience or animal biology from a feminist perspective.

Additionally, I think it would be valuable to extend this research outside of debates surrounding genetics, sex development, and gender. This model may be just as applicable in other disciplines and specialties. I see real value in the potential to, for example, bridge the class gap between the educated and those not as fortunate. By providing a series of BLSEs to enlighten a public on myriad topics, ones that they would not otherwise be exposed to outside of higher education, we may open up an alternative path for citizens to seek out and learn new information. Lastly, I would like to see what even more radical versions of this text would look like. In psychology, it is said that change comes from within, and that principle can be applied to critical social change as well. Critical work has an ethical obligation to not remain within the halls of science and/or academia but find its way into the hands of the masses.

CHAPTER 6: CONCLUSION

In this study, I analyzed the arguments used by Anne Fausto-Sterling, in her book *Sexing the Body: Gender Politics and the Construction of Sexuality* (2000) to critique notions of genetics-based sex development and assignment. My study was guided by three research questions. First, how does Fausto-Sterling translate technical arguments questioning biological sex for a popular audience? This engaged prior research on popularization studies and the strategies identified for translating scientific information

for lay audiences. Second, how do these translations vary from their technical origins? That is, after ascertaining the author's claims (that argument or proposition), data (evidence or proof), and warrants (the explicit or implicit reasoning that connects claims and data), were there differences in arrangement structure or context between Fausto-Sterling's use of the source material and the source material itself. Finally, what rhetorical and/or ideological work is accomplished by these translations?.

Strictly speaking, when an author makes a choice to alter content, it reveals something about their values and beliefs. To use a practical, yet admittedly inane, example, if, in the wake of a natural disaster, one national headline read, "Poor People Unprepared for Life Event," and another read "Community Rocked by Disaster," we could deduce that the former held an unfavorable, even biased, view of the community affected by the event. Similarly, if Fausto-Sterling altered the organization, context, or content of the primary author's work, it would reveal something about her position regarding the material cited.

Once I had located all instances where genetics-based biological sex development and assignment were discussed, I identified two related categories about which they were made: first, that of phenotype (the physical expression of the combination of chromosomes and hormones on the body); and second, social meaning (the cultural interpretation of a phenotype). My findings, as confirmed in the discussion, demonstrated when and how alterations were made to aspects of the cited material. One major thematic difference was that Fausto-Sterling did not always agree with all of the viewpoints of the author she cited, but still incorporated their work in a way that was consistent with the original claim. For example, where Dreger's work on hermaphroditism was cited, Fausto-

Sterling felt strongly against all three physicians who helped create the dichotomous categories in which to assign them. Both authors shared the physicians' work as data, however Dreger only noted the most recent physician, Klebs, as culpable in the scientific erasure of "true" hermaphrodites.

Another major finding was that Fausto-Sterling provided a practical application of the poststructuralist theory of social determinism. Critics of poststructuralist feminism often cite that it is useful in abstract but provides no real-world solutions to social problems. In Fausto-Sterling's use of Butler (1993), she illustrated that this abstract theory can be literally interpreted through the physical bodies of the intersexed. She demonstrated that the constitutive force of social construction defended in theory relates to how intersexed bodies live as abject, or uninterpretable, in a social world where binary boundaries rule what is counted as real. In other words, if nothing more, Fausto-Sterling has provided a tremendous counterargument to those who would disqualify social determinism as folly.

In addition, Fausto-Sterling displayed her ability to expound upon previous scholarship, concurrent with the landscape of BLSEs, taking what is grounded in the radical and pushing it to further extremes of the imagination. For example, Kessler (1998) proposed effective discourse surrounding genital variability as the beginning of the acceptance of more varied ways of "doing" gender. The possibilities Kessler saw inspired Fausto-Sterling to imagine her own "utopia" (her term), where eventually gender was irrelevant. She altered the exact structure of Kessler's argument, but deduced something that maybe Kessler didn't see herself. I believe this is a valuable trait that Fausto-Sterling possesses, but it also illustrated the practical utility of BLSEs for

advancing theory. *Sexing the Body*, in particular, is a useful model for translating sex-related academic/genetic-science information to lay audiences.

In line with feminist literature concerned with avenues for social change, my study provides beneficial material to guide writing towards the style found in Fausto-Sterling's radical BLSE. With its effective balance between scholarly rigor and accessibility, and potential for disseminating radical philosophy to lay audiences, BSLEs are an effective genre for delivering highly technical, or jargon-laden, writing in a way that is comprehensible to non-expert audience. Also, considering the influential power of scientific information for the masses, BLSEs possess an ethical dimension, properly translating information that can have tremendously negative consequences through misunderstandings.

Academics, and particularly communication scholars, value the ability to interrogate the institutions that maintain orders of hierarchy, principally those that serve to oppress or disenfranchise certain groups, and Fausto-Sterling (as Kessler before her) has illustrated that the social construction of biological sex lives within one of those institutions, that of Science. However, scholarly work often remains within the seminar rooms and journal publications that are restricted to the common person. Now that Fausto-Sterling has taken that information and recalibrated it for general consumption, the number of people who can be included in the debate has the potential to multiply, which I believe should be a priority.

As stated before, I do not believe that this is fantasy or idealism. *Sexing the Body* has already proven to be a foundational inspiration for gender courses across the country, as well as for popular publications to take a more progressive position in their writing about

issues related to sex and gender. One of the top three newspapers in the country, The New York Times, published an article where the author stated that she uses Fausto-Sterling's work as a week-one introduction for anthropology and gender studies undergraduates, and then continued to discuss the counterpoints *Sexing the Body* makes about traditional notions of sex development. That and other popular publications show what a major impact her work has had on both academic and public discourse.

The science on this topic has made its way into mainstream formats and with each new revelation indicates that our understanding and measure of biological sex development and its subsequent assignment are becoming increasingly outdated. From genitalia, to hormones, to chromosomes, to genes, the characteristics used to define the category of male and female sex(-at-birth) overlap more than they neatly align. So, what, right? Who cares whether or not someone *is* or *isn't* a certain sex? Well, when considering recent events, it is apparent that many people do. North Carolina's attempt at a "Bathroom Bill", and Trump's religious freedom order and ban on transgender military service, are examples of merely the most recent effects of a historic public misunderstanding, and oversimplification, of a complex, overlapping sex/gender category. As science is still considered the most powerful authority for explaining "life" (with exception of the pockets of anti-intellectualism, like those of the current Trump administration), this is a unique moment. I believe that the information available to us now, established by Fausto-Sterling in form and content, could shape a powerful movement for issues relating to political and social justice.

This study contributes to current research on the rhetoric of science, especially the study of accommodations and popularizations of scientific texts. Fahnestock (1986) noted

that the translation of scientific information is a moral problem owing to the severe repercussions it can have owing to its powerful influence on the audience. At the end of her 1986 essay, she suggests that new teaching methods be adopted for students writing in STEM owing to the potential for miscommunication and the ramifications of misunderstanding of scientific findings. She used an example of two John Hopkins psychologists who, in 1980, reported in *Science* on the results of a study that tested for mathematic aptitude between boys and girls.

Noting the rapid uptake in popular press, Fahnestock said that the translation altered the results, eliminating all qualifiers and hedges in the findings, which suggested that boys were in fact better, and that the “difference [was] caused by inherent aptitude” (p.286). My study has demonstrated that Fausto-Sterling’s poignant critiques of scientific discourses and practices, gender and Science, and the ideologies of science preserves the technical and theoretical specificity and accuracy of the original formulations. This positions her text as a pedagogical tool for Fahnestock’s desired novel teaching practices. Both *Myths of Gender* and *Sexing the Body* are currently utilized as foundational educational aids in anthropology and gender studies classes across the country, but this study provides evidence to suggest a third application as a model for technical writing in the sciences.

To close, we are in the midst of a rare moment. There is a growing public interest in genomics and its explanatory potential for questions ranging from genetic diseases to personal ancestry and beyond. The interest has leaked over into popular science magazines, which have picked up various aspects of genetic science debates like transgender identity, apparent mixed-sex-determinations, and the like. Up to this point,

there hasn't been much in the way of quality, critical engagement with the subject of genetics/genomics which could be considered effectively accurate and accessible to the public. It is here where we may find a service to be taken from a blending of scientific and academic writing potentially fostered in the hybrid genre of book-length scholarly essays. As we seek out new avenues for social change by providing rigorously critiqued, highly accessible, valuable information to a ready public, we may just find the BLSE to be an extremely valuable piece of that puzzle.

REFERENCES

- Arana, G. (2018, Jan 1). The most urgent queer political battles to fight in 2018. *them*. Retrieved from <https://www.them.us/story/the-most-urgent-queer-political-battles-to-fight-in-2018>
- Barthel, M. (2018, Jun 13). Newspapers fact sheet. *Pew Research Center: Journalism and Media*. Retrieved from <http://www.journalism.org/fact-sheet/newspapers/>
- Bazerman, C. (1996). Reporting the experiment: The changing account of scientific doings in the philosophical transactions of the royal society. In Randy Allen Harris (Ed.), *Landmark essays on the rhetoric of science* (pp.1665-1800). Mahwah, NJ: Lawrence Erlbaum.
- Bloor, D. (1977). *Knowledge and social imagery*. London, UK: Routledge & Kegan Paul.
- Bornstein, K. (1994). *Gender outlaw: On men, women, and the rest of us*. New York, NY: Routledge.
- Birke, L. (2000). *Feminism and the biological body*. New Brunswick, NJ: Rutgers University Press.
- Booker, A. & Jung, J. (2018). *Feminist rhetorical science studies: Human bodies, posthumanist worlds*. Carbondale, IL: Southern Illinois University Press.
- Brockriede, W. & Ehninger, D. (2009). Toulmin on argument: An interpretation and application. *Quarterly Journal of Speech*, 46, 44-53.
- Burke, P. (1996). *Gender shock: Exploding the myths of male and female*. New York, NY: Doubleday.
- Butler, J. (1990). *Gender trouble*. New York, NY: Routledge.
- Butler, J. (1993). *Bodies that matter*. New York, NY: Routledge.
- Butler, J. (2004). *Undoing gender*. New York, NY: Routledge.
- Campbell, J. A. (1990) Scientific discovery and rhetorical invention: The path to Darwin's origin. In Herbert W. Simons (Ed.), *The Rhetorical Turn: Inventions and Persuasion in the Conduct of Inquiry*. (pp.58-90). Chicago, IL: The University of Chicago Press.
- Ceccarelli, L. (2011). Manufactured scientific controversy: Science, rhetoric, and public debate. *Rhetoric of Public Affairs*, 14, 195-228.

- Chase, C. (1998a). Hermaphrodites with attitude: Mapping the emergence of intersex political activism. *GLQ: A Journal of Lesbian and Gay Studies*, 4, 189-211.
- Chase, C. (1998b). Surgical process is not the answer to intersexuality. *Journal of Clinical Ethics*, 9, 385-392.
- Clough, P. (1994). *Feminist thought: desire, power, and academic discourse*. Oxford, UK; Cambridge, MA: Blackwell.
- Condit, C. (1999). *The meaning of the gene*. Madison, WI: The University of Wisconsin Press.
- Coventry, M. (2000, Oct/Nov). Making the cut: It's a girl...or is it? When there's doubt, why are surgeons calling the shots? *Ms. Magazine*. Retrieved from <http://www.msmagazine.com/oct00/makingthecut.html>
- Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *University of Chicago Legal Forum*, 1989, 139-167.
- Danisch, R. (2010). Political rhetoric in a world risk society. *Rhetoric Society Quarterly*, 40, 172-192.
- Dewhurst, C. J. & Gordon, R. R. (1963). Change of sex. *The Lancet*, 2, 1213-1216.
- Diamond, M. (1996). Gender identity: more options than "man" or "woman". *Honolulu Advertiser*, n.v., B-1, B4.
- Dowdey, D. (1987). Rhetorical techniques of audience adaptation in popular science writing. *Journal of Technical Writing and Communication*, 17, 275-285.
- Dreger, A. D. (1998). *Hermaphrodites and the medical invention of sex*. Cambridge, MA; London, UK: Harvard University Press.
- Dreger, A. D. (2015). *Galileo's middle finger: Heretics, activists, and one scholar's search for justice*. New York, NY: Penguin Books.
- Dreifus, C. (2001, Jan 2). A conversation with – Anne Fausto-Sterling; Exploring what makes us male and female. *New York Times*. Retrieved from <https://www.nytimes.com/2001/01/02/science/a-conversation-with-anne-fausto-sterling-exploring-what-makes-us-male-or-female.html>
- Dubois, B. L. (1986). From *New England Journal of Medicine* and *Journal of the American Medical Association* through the Associated Press to the local newspaper: Scientific translation for the laity. In T. Bungarten (Ed.), *Wissenschaftssprachen und gesellschaft: Aspekte der kommunikation und des*

wissentransfers in der heutigen zeit] Scientific languages and society: Aspects of communication and scientific transfer in the contemporary period (pp. 243-53). Hamburg, Germany: Akademion.

- Fahnestock, J. (1986). Accommodating science: The rhetorical life of scientific facts. *Written Communication*, 3, 275-296.
- Fahnestock, J. (1999). *Rhetorical figures in speech*. New York, NY: Oxford University Press.
- Fahnestock, J. (2004). Preserving the figure: Consistency in the presentation of scientific arguments. *Written Communication*, 21, 6-31.
- Fausto-Sterling, A. (1992). *Myths of gender: Biological theories about women and men* (2nd Ed). (n.p.): Basic Books.
- Fausto-Sterling, A. (1993). The five sexes: Why male and female are not enough. *The Sciences*, 20-24.
- Fausto-Sterling, A. (2000). *Sexing the body: Gender politics and the construction of sexuality*. (n.p): Basic Books.
- Feinberg, L. (1996). *Transgender warriors*. Boston, MA: Beacon Press.
- Fey, B. & Moon, D. (1977). What would an adequate philosophy of social science look like? *Philosophy of Science*, 7, 209 – 227.
- Fine, C. (2010). *How our minds, society, and neurosexism create difference of gender*. New York, NY; London, UK: W. W. Norton & Company Ltd.
- Fine, C. (2017). *Testosterone Rex: Myths of science, sex, and society*. New York, NY; London, UK: W. W. Norton & Company Ltd.
- Flax, J. (1983). Political philosophy and the patriarchal unconscious: A psychoanalytic perspective on epistemology and metaphysics. In S. Harding & Hintikka, M. (Ed's) *Discovering reality: Feminist perspectives on epistemology, metaphysics, methodology, and philosophy of science*. (pp. 245–281). Dordrecht, NL: Reidel.
- Flax, J. (1986). Gender as a social problem: In and for feminist theory. *American Studies/Amerika Studien*, Journal of the German Association for American Studies.
- Frung, M. (1992). A postmodern feminist legal manifesto. *Harvard Law Review*. 105, 1045-1075.

- Garbo, J. (2000, Jun 28). Sexing the body. *Here Magazine: Saint John's News and Entertainment Voice*. Retrieved from <https://joegalbo.files.wordpress.com/2007/08/sexing-the-body.pdf>
- Graham, S. S. (2015). *The politics of pain medicine: A rhetorical-ontological inquiry*. Chicago, IL: The University of Chicago Press.
- Happe, K. (2013). *The material gene: Gender, race, and heredity after the human genome project*. New York, NY; London, UK: New York University Press.
- Haraway, D. (1985). A manifesto of cyborgs: Science, technology, and socialist feminism in the 1980s. *Socialist Review*, 80, 82-115.
- Haraway, D. (1989). *Primate visions: Gender, race, and nature in the world of modern science*. New York, NY; London, UK: Routledge.
- Harding, S. (1986). *The science question in feminism*. Ithica, NY: Cornell University Press.
- Harding, S. (1992). After the neutrality ideal: Science, politics, and strong objectivity. *Social Research*, 59, 567-587.
- Harding, S. (2006). *Science and social inequality: Feminist and postcolonial issues*. (n.p.): Sandra Harding.
- Harding, S. & Hintikka, M. (2004) Introduction. In S. Harding & Hintikka, M. (Eds) *Discovering Reality: Feminist perspectives on epistemology, metaphysics, methodology, and philosophy of science*. (pp. ix-xix). Dordrecht, NL: Reidel.
- Harris, R. A. (2013). The rhetoric of science meets the science of rhetoric. *Poroi: An Interdisciplinary Journal of Rhetoric Analysis & Invention*, 9, 2-12.
- Hartsock N. (1983) The feminist standpoint: Developing the ground for a specifically feminist historical materialism. In Harding S. & Hintikka M. (Ed's) *Discovering Reality: Feminist perspectives on epistemology, metaphysics, methodology, and philosophy of science* (pp. 283-310). Dordrecht, NL: Reidel.
- Haskell, T. (1990). Objectivity is not neutrality: Rhetoric vs. practice in Peter Novick's *That Noble Dream*. *History and Theory*, 29, 129-157.
- Hausman, B. (1992). Demanding subjectivity: transsexualism, medicine, and the technologies of gender. *Journal of The History of Sexuality*, 3, 270-302.
- Hausman, B. (1995). *Changing sex: Transsexualism, technology and the idea of gender in the 20th century*. Durham, NC: Duke University Press.

- Hekman, S. (1997). Truth and method: feminist standpoint theory revisited. *Signs: Journal of Women in Culture and Society*. The University of Chicago Press. 22, 341–365.
- Hintikka, J. & Hintikka, M. (1983). How can language be sexist? In Harding, S. & Hintikka, M. (Ed's) *Discovering reality: Feminist perspectives on epistemology, metaphysics, methodology and philosophy of science*. (pp. 139-148). Dordrecht, NL: Reidel.
- hooks, b. (1981) *Ain't I a woman: Black women and feminism*. (n.p.): South End Press.
- Hornig, S. (1990) Television's NOVA and the construction of scientific truth. *Critical Studies in Mass Communication*, 7, 11-23.
- Kaplan, G. T., & Rogers, L. J. (2003). *Gene worship: Moving beyond the nature/ nurture debate over genes, brain and gender*. New York, NY: Other Press.
- Keller, E.F. (1984). *Reflections on gender and science*. New Haven, CT: Yale University Press.
- Keller, E. F. (1988). Feminist perspectives on science studies. *Science, Technology, & Human Values*, 13, 235-249.
- Kentish, B. (2017, Jul 27). Trump administration says Civil Rights Act should not stop LGBT discrimination by US employers. Independent. Retrieved from <https://www.independent.co.uk/news/world/americas/us-politics/donald-trump-civil-rights-act-1964-lgbt-rights-transgender-ban-us-military-tweet-justice-department-a7862621.html>
- Kessler, S. J. (1990). The medical construction of gender: Case management of intersexed infants. *Signs: Journal of Women in Culture and Society*, 16, 3-26.
- Kessler, S. J. (1998). *Lessons from the intersexed*. New Brunswick, NJ: Rutgers University Press.
- Kessler S. J., & McKenna, W. (1978). *Gender: An ethnomethodological approach*. New York, NY: Wiley.
- King, B. J. (2015, Nov 9). What does it mean to be intersex? *NPR*. Retrieved from <https://www.npr.org/sections/13.7/2015/11/19/456458790/what-does-it-mean-to-be-intersex>
- Khoirunisa, A. & Indah R. N. (2017). Argumentative statements in the 2016 presidential debates of the U.S.: A critical discourse analysis. *JEELS*, 4, 155-173.
- Kline, M. (1980). *Mathematics: The loss of certainty*. New York, NY: Oxford.

- Kuhn, T. (2012). *The structure of scientific revolutions (4th Ed)*. Chicago, IL: University of Chicago Press.
- Latour, B., & Woolgar, S. (1979). *Laboratory life: The social construction of scientific facts*. Beverly Hills, CA: Sage.
- Lievrouw, L. A. (1990). Communication and the social representation of scientific knowledge. *Critical Studies in Mass Communication*, 7, 1-10.
- McAllister, J. W. (2014). Methodological dilemmas and emotion in science. *Synthese*, 191, 3143-3158.
- McGee, E. O., & Bentley, L. (2017). The troubled success of black women in STEM. *Cognition and Instruction*, 35, 265-289.
- Miller, C. R. (1984). Genre as social action. *Quarterly Journal of Speech*, 70, 151-167.
- Miller, C. R. & Fahnestock, J. (2013). Genres in scientific and technical rhetoric. *Poroi: An Interdisciplinary Journal of Rhetorical Analysis and Invention*, 9, 1-4.
- Molina, M. L. (2013). La estructura argumentativa como herramienta de análisis crítico del discurso en noticias sobre personas en situación de pobreza. *Cadernos de Linguagem e Sociedade*, 14, 212-233.
- Money, J. & Ehrhardt, A. A. (1972). *Man and woman, boy and girl*. Baltimore, MD: John Hopkins University Press.
- Montano, G. (2017, Aug 21). Confronting hate and violence against the LGBT community. Pediatric News. Retrieved from <https://www.mdedge.com/pediatricnews/article/144925/mental-health/confronting-hate-and-violence-against-lgbt-community>
- Moulton, J. (1983). A paradigm of philosophy: The adversary method. In S. Harding & M. Hintikka (Ed's) *Discovering reality: Feminist perspectives on epistemology, metaphysics, methodology and philosophy of science* (pp. 149-164). Dordrecht, NL: Reidel.
- Myers, G. (1985). The social construction of two biologists' proposals. *Written Communication*, 3, 853-856.
- National Geographic (2017). Journeys in film: Gender revolution. Retrieved from: <https://www.nationalgeographic.com/pdf/gender-revolution-guide.pdf>
- Norman, O. (1998). Marginalized discourses and scientific literacy. *Journal of Research in Science Teaching*, 35, 365-74.

- Palm, (2018, Jun 4). Twenty years after Matthew Shephard's murder, his parents fight on for civil rights. *Orlando Sentinel*. Retrieved from <http://www.orlandosentinel.com/entertainment/arts-and-theater/the-artistic-type/os-et-judy-dennis-shepard-pulse-events-20180603-story.html>
- Popper, K. (1959). *The logic of scientific discovery*. New York, NY: Basic Books.
- Popper, K. (1972). *Conjectures and refutations: The growth of scientific knowledge* (4th Ed). London, UK: Routledge & Kegan Paul.
- Prelli, L. J. (1989). *A rhetoric of science: Inventing scientific discourse*. Columbia, SC: University of South Carolina Press.
- Proctor, R. (1988). *Racial hygiene: Medicine under the Nazis*. Cambridge, MA: Harvard University Press.
- Quine, W. V. O. (1953). Two dogmas of empiricism. In *From a logical point of view: Nine logico-philosophical essays*. Cambridge, MA: Harvard University Press.
- Reskin, B. F. (1978). Sex differentiation and the social organization of science. *Sociological Inquiry*, 48, 6-37.
- Rorty, R. (1979). *Philosophy and the mirror of nature*. Princeton, NJ: Princeton University Press.
- Rose, H. & Rose, S. (1976). *Ideology of/in the natural sciences*. Cambridge, MA: Schenkman.
- Rose, H. (1983) Hand, brain, and heart: A feminist epistemology for the natural sciences. *Signs: Journal of Women in Culture and Society*, 9, 67-80.
- Rose, H. & Rose, S. (2014) *Genes, cells and brains: The promethean promise of the new biology*. London, UK; New York, NY: Verso.
- Rothblatt, M. (1995). *The apartheid of sex: A manifesto on the freedom of gender*. New York, NY: Crown.
- Rouse, J. (1987) *Knowledge and power: Toward a political philosophy of science*. Ithaca, NY: Cornell University Press.
- Rowan, K. E. (1989). Moving beyond the *what* to the *why*: Differences in professional and popular science writing. *Journal of Technical Writing and Communication*, 19, 161-179.
- Ruha, B. (2016). Interrogating equity: A disability justice approach to genetic engineering. *Issues in Science and Technology*, 32, 51-54.

- Rutherford, A., Vaughn-Blount, K., & Ball, L. C. (2010). Responsible opposition, disruptive voices: Science, social change, and the history of feminist psychology. *Psychology of Women Quarterly*, 34, 460-473.
- Scharrer, L., Rupieper, Y., Stadtler, M., Bromme, R. (2017). When science becomes too easy: Science popularization inclines laypeople to underrate their dependence on experts. *Public Understanding of Science*, 8, 1003-1018.
- Schiff, M. (2001, Jun 17). Saving Ryan's Privates: Anne Fausto-Sterling again Disarms the Medical Establishment. *Metapsychology online reviews*. Retrieved from http://metapsychology.mentalhelp.net/poc/view_doc.php?type=book&id=642&cn=394
- Scott, M. (2006). *Shadow man*. Maple Shade, NJ: Lethe Press.
- Shear, M. D. & Savage, C. (2017, Jul 27). In one day, Trump administration lands 3 punches against gay rights. *The New York Times*. Retrieved from <https://www.nytimes.com/2017/07/27/us/politics/white-house-lgbt-rights-military-civil-rights-act.html>
- Smith, D. (1981). The experienced world as problematic: A feminist method. Sorokin Lecture no. 12. Saskatoon: University of Saskatchewan.
- Smith, D. (1997). Comment on Hekman's 'Truth and Method: Feminist Standpoint Theory Revisited'. *Signs: Journal of Women in Culture and Society*. 22, 392-398.
- Smith, D. (1997). *Feminism and Marxism: A place to begin, a way to go*. Vancouver, BC: New Star Books.
- Stewart, C. (2009). Socioscientific controversies: A theoretical and methodological framework. *Communication Theory*, 19, 124-145.
- The Editors (2017, Sept 1). The new science of sex and gender. *Scientific American*. Retrieved from <https://www.scientificamerican.com/article/the-new-science-of-sex-and-gender>.
- Toulmin, S. E. (1953). *The uses of argument*. Cambridge, NY: Cambridge University Press.
- Travers, A. (2008). The sports nexus and gender injustice. *Studies in Social Justice*, 2,
- Varghese, S.A., & Abraham, S. A. (2004). Book-length scholarly essays as a hybrid genre in science. *Written Communication*. 21(2), 201-231.

- Wiederkehr, S. (2009). We shall never know the exact number of men who have competed in the Olympics posing as women': Sport, gender verification and the cold war. *The International Journal of the History of Sport*, 26, 556-572.
- Wilson, T. (2018, Jan 29). Texas is the epicenter for 'an epidemic of violence' against LGBTQ people. *Rewire.News*. Retrieved from <https://rewire.news/article/2018/01/29/texas-epicenter-epidemic-violence-lgbtq-people/>
- Wylie, A. (2012). "Feminist Philosophy of Science: Standpoint Matters." Presidential Address delivered to the Pacific Division APA. *Proceedings and Addresses of the American Philosophical Association*. 86(2), 47-76.
- Young, H. H. (1937). *Genital abnormalities, hermaphroditism and related adrenal diseases*. Baltimore, MD: Williams & Williams.
- Zimmerman, D. H. & West, C. (1987). Doing gender. *Gender and Society*, 1, 125-151.