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Majors: Psychology and Gender Studies (supplemental)

Objectivity and Gender in Science: Implications for Psychology

Gender Studies Senior Thesis

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We live in a world that is inundated with both scientific and scientistic research—direct-to-consumer advertising manifests itself as prescription medications plastered in magazines, in bus stops and on television; one study conducted with an unknown methodology is condensed into a 45-second blurb delivered by an evening news anchorwoman; over-the-counter vitamins and diet supplements purport to be “clinically tested.” For the average American, these daily messages are a fact of life, and go either unnoticed or are not critically examined. How did we get here? Who are these scientists conducting this research?

These are questions that have come to the forefront of feminist scholarship regarding both the physical and social sciences. Though most human beings are not scientists, these questions about science translate into larger questions that have yet gone unanswered despite 30 years of feminist consciousness-raising. Sandra Harding’s exhortation to “take everyday life as problematic” encourages feminists of all varieties, including everyday men and women, to be concerned about the ways in which scientific literature and methodology is gendered.

Feminist philosophers of science have recently begun challenging the widely held belief that the advances made since the 17th century’s Scientific Revolution have been wholly objective and free from bias or personal influences. They argue that the imposed divide between the researcher and the object of research is artificial and is actually harming the domain of science, as it presumes a false sense of infallibility in the scientific method. Harding further explicates this issue by highlighting two distinct problems, noting, “One can understand…competing

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1 While the term *scientific* has the denotation of standardized methodology for inquiry, *scientistic* is used as a criticism to indicate incorrectly used science, such as when the methods and theories of one discipline are applied to another. It can also refer to pseudoscience, such as the “study” of ghosts or other supernatural phenomena, which appear to be rigorous in methodology but lack basic central tenets of true empirical research.

arguments on two topics—scientific method and history—in order to explain in their different ways the causes of sexist and androcentric results of scientific research. Problems with both scientific methodology (the “how” of science) and the history of science (the “why”) have created the current problems that feminist philosophers of science have pinpointed.

Should we then completely discard the current model of scientific research? Are all discoveries made within the last one thousand years nullified by this feminist critique? Not so, say feminist philosophers of science—one need only realize that the current standard of “objectivity” is incomplete until it fully takes into account the perspective of the scientist. This has begun to be done in some of the social or so-called “softer” sciences, particularly psychology.

I seek, then, to examine the history of science as we know it today, in order to more concretely understand the motivations of those men who first espoused the idea of a separation between subject (the scientist) and object (the process, organism, or concept being studied). Relying on feminist scholarship, I will show that this process was inherently gendered and has shaped the way that we think about science today. Relating these critiques to psychology, I will then examine the unique way in which the scientific method and the feminist objections to the standard model of objectivity can shape the way in which humans study themselves, finally looking at the role that language plays in this complex fusion of scientific theory and practice.

Scientific research is often taken at face value, and it is not only laypeople who are prone to put too much faith in the results of a study simply because it has been published in a peer-reviewed journal (or, worse yet, if its findings have been boiled down to a 30-second soundbite

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on the evening news). Even those with rigorous training can too fall prey to scientism, because “the sciences have been blind to their own sexist and androcentric research practices and results.” A better understanding of how we got to this point will be informed by a history of the thinkers whose reasoning undergirds modern scientific methodology, beginning with a survey of the nature of the mind and its relationship to the human body.

René Descartes, a 17th century French philosopher and mathematician, dealt with questions regarding the relationship of the mind to the body by proposing a theory of dualism—that the mind and body each operated in separate spheres that just so happened to move synchronously, though separately. He is perhaps most famous for his cogito, arguing that the only fact that he can truly know with certainty about the external world (if one existed at all) is that as a thinking entity, he himself existed. This skepticism informed his dualist philosophy of mind. Susan Bordo pathologizes Descartes’ radical doubt, noting “a certain instability, a dark underside, to the bold rationalist vision.” She is not the first theorist to suggest that the cogito underscores a profound paranoia in Descartes’ writing, which has left its mark on the whole of science. In articulating his personal separation from any external reality, Descartes left an intellectual watermark “based on clarity, dispassion, and detachment.” Bordo further argues that this “‘great Cartesian anxiety’...[is fundamentally] anxiety over separation from the organic female universe of the Middle Ages and the Renaissance....[resulting in] a ‘supermasculinized’

6 Ibid.
model of knowledge.” As we will see, nature as feminine was problematic for many involved in science.

Descartes’ legacy of disembodied knowledge has spread to other domains besides science. In fact, Naomi Scheman attributes the “paranoia” of the *cogito* as influencing the whole of liberal political ideology, upon which modern democracies such as the United States were founded, since “democracy is seen as needing to be defended against ‘the excesses of unbridled relativism and subjectivism.’”

Democracy, however, is not a monolith, but rather a continuum, and the U.S. and other democratic nations have fluctuated on this spectrum throughout history. Until the early 20th century, suffrage was denied to American women, and Scheman attributes this to the Cartesian desire to create an artificial self-other distinction: “the splitting off and denial of (or control over) aspects of the self [has] been associated with the lives of the disenfranchised, and...those gestures exhibit the logic of paranoia.”

Various underrepresented groups finally won suffrage or another modicum of political legitimacy only after “promulgating the idea that underneath the superficial differences of skin colour, genitalia, or behavior in the bedroom, Blacks, women, and gays and lesbians are really just like straight white men.” This “logic of paranoia” has certainly influenced the sciences, but can be found throughout European and American culture with its emphasis on individualism, personhood, rights and freedoms.

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9 Ibid., 205.
10 Ibid., 204.
11 Ibid., 217.
Psychology was largely limited to questions regarding the philosophy of mind\textsuperscript{12} until Wilhelm Wundt began probing scientifically into cognition in Leipzig in the late 19\textsuperscript{th} century, using introspection as a technique to inform his structuralist philosophy. Structuralism was “the first major school of thought in psychology”\textsuperscript{13} which analyzed the mind, attempting to separate it into distinct components. William James’s classic text *Principles of Psychology* around the same time rendered the unseen realm of thoughts and emotions as worthy of rigorous regimented inquiry, motivating the competing functionalist school of thought to turn towards a pragmatic approach in acquiring knowledge about the mind because such information would be useful for humankind.

Yet all of this changed as behaviorism found favor within the psychological community in the mid-twentieth century. Researchers such as E. L. Thorndike, B. F. Skinner and Ivan Pavlov claimed that the “black box” of cognition (so called by scientists who believe that the mind cannot be defined until its inputs and outputs are fully understood) was nothing more than a computer, reducing inner mental life to a series of stimuli and responses. These computations could be analyzed and tested, the behaviorists claimed, only by examining patterns of behavior in order to better understand the punishments and rewards at work. Behaviorists rejected the idea of trying to understand neural processes themselves and instead championed an approach of extreme pragmatism, focusing exclusively on outward, observable behaviors.

Rejecting this colder and more detached view of the human person as nothing more than a machine, the cognitive revolution opened the “black box” and gave way to modern

\textsuperscript{12} In philosophy, questions regarding the mind/body connection have been explored in great detail. Several schools of thought debated the true nature of this relationship. Monists claimed that the mind and the body were of similar ontology, while dualists argued that each was of a distinct substance.

psychology—an all-encompassing discipline rich with competing methodologies synthesizing both the conscious and unconscious in order to work towards a fuller understanding of cognition, emotion, and personality. Research informed by various methodologies, including the psychoanalytic and behaviorist views, have all discussed the processes by which identity and a sense of one as a “self” is formed. Most of these hypotheses regarding the self/other distinction have been problematized by feminist thinkers as relying on a false distinction between scientific objectivity and subjectivity, and many also correspond to “the continuing dominance of individualism in the philosophy of psychology. A fully social conception of knowledge that embraces diversity among knowers requires a corresponding conception of persons as irreducibly diverse and essentially interconnected.”

In “Reflections on Gender and Science,” Evelyn Keller repeatedly problematizes this distinction between subject and object, and the separation is made more difficult due to the historical conflation of objectivity and masculinity, while subjectivity is feminized. Autonomy “connotes a radical independence from others, mapping closely onto an interpretation of objectivity that implies a reductive disjunction of subject from object.” Yet this is not a gender-neutral process. Notions of objectivity, autonomy and identity are difficult to untangle from the framework of gender. Keller notes that these concepts are related because “objectivity…correlates with a conception of masculinity denying all traces of femininity.” As I will explain shortly, Sir Francis Bacon and his contemporaries who pioneered what we now take for granted as the scientific method made no

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16 Ibid.
attempt to hide their gendered interpretations of science’s subjects (scientists) and objects (nature).

Despite these objections that have informed myriad feminist philosophies of science, the traditional and rarely questioned common view is that science is indeed objective, irrespective of authorship. The credence given to scientific findings is justified due in part to the notion of replication, that any scientist using the prescribed method can arrive at the same conclusion if the item in question does, in fact behave or work as predicted. The scientific method, considered infallible by many researchers, is a product of human design, and, as sophisticated as it may be, can therefore be invalidated. The modern methodology for conducting scientific research was developed by Sir Francis Bacon and others who sought a way to unlock the earth’s secrets in the early 17th century, encouraging budding scientists to embrace their steps with the promise that they would “‘[lead] to [the inquirer] Nature with all her children to bind her to your service and make her your slave…not ‘merely exert[ing] a gentle guidance over nature’s course; [but instead the new scientific method promised] the power to conquer and subdue her, to shake her to her foundations.’”17 Bacon and his contemporaries believed that they could distance themselves from nature in such a way as to discern the true character of natural processes, free from biases and potential distortions, though the language used to describe these methods was anything but free from sexual innuendo.

Philosophers of science have attacked this particular reasoning in several ways. First of all, ecofeminists have argued that by gendering nature as female, the (inevitably male) founders

of science created images of the planet and physical world that are incorrect and problematic for female parents and caregivers, legitimating their subordination in society. In personifying nature as “mother,” erroneous images of the earth as somehow actively fostering life, particularly human life, have become part of the average person’s psyche. Similarly, and perhaps more deleterious, is the fact that with the feminization of nature has come the sexualization of science—exploring natural processes and uncovering nature’s “secrets” were often described by Bacon and others in terms of forcible sexual encounters or even rape explicitly. The use of such language by learned scholars legitimates such images in less academic contexts.

Standpoint theorists have persuasively argued that the subject/object distinction pioneered by Bacon is inherently flawed. While a given researcher may try to distance himself as much as possible from his subject, he himself is nevertheless embedded in a cultural context from which he cannot be extricated. Even if a scientist does take great pains not to influence the data she is collecting, her personal judgment still affects the validity of her research in that she has made the conscious determination that certain subjects are more fitting to research than others. This human element can never be truly removed, say standpoint theorists. While the research itself may be free of human error, the selection of the topic itself carries with it the potential for bias. The fundamental question, then, is “how can feminists create research that is

\[Ecofeminist theorists have argued that “the woman-nature link” is harmful for both women and the environment. One theorist, Catherine Roach, hypothesizes that this continued conflation “help[s] to maintain the mutually supportive, exploitative stances we take toward our mothers and toward our environment,” yet the earth as a planet cannot actively care for us or express love and affection as a human (or even non-human) mother can. She further argues that recently popular environmentalist exhortation to value the planet as we value our mothers is also damaging, since mothers and domestic work are chronically undervalued in our society. See “Loving Your Mother: On the Woman-Nature Relation,” Hypatia 6:1 (Spring 1991): 299-313.\]
for women in the sense that it provides less partial and distorted answers that arise from women’s lives and are not only about those lives but also about the rest of nature and social relations?\(^{19}\)

Take for instance Sigmund Freud’s monumental work in developing his theory of psychosexual development. Using a case-study method, which relies on intensive interviews with a small number of (often nonrepresentative) subjects, has its own known drawbacks,\(^{20}\) but does allow a researcher in-depth insight into a small population of individuals. Yet what is the extent of such a study’s external validity?\(^{21}\) Profiling a clinical population will have varied relevance for the general populace—perhaps those who sought treatment for a similar condition share a certain genetic trait that is quite rare. Similarly, case studies exclude the analysis of individuals considered “normal,” even though normality connotes nothing more than a statistical majority, and can therefore be equated with “average.” Such an average, though mathematically valid, may never exist in the general population.\(^{22}\)


\(^{20}\) Only true experiments allow a researcher to develop a causal link between phenomena. Case studies can be helpful in detailing rare phenomena, and may also elucidate situations where random-assignment experiments would be unethical (notably, in cases where children have undergone extensive sensory deprivation for many years). But the case study design is plagued by a lack of generalizability to the general population (that is, little to no external validity), since it is by definition an in-depth look at as few as one individual subject. Also, since the researcher may implement a particular intervention but has not controlled for confounding variables, no causality can be inferred.

\(^{21}\) External validity is the extent to which a research finding in a controlled (often laboratory) situation can be generalized to real-world environments. For a study conducted using a case study method, external validity is nearly zero, since the population in question is usually a self-selected group of individuals with a rare trait, disease, or characteristic.

\(^{22}\) As noted in 11, the case study method is just one of a range of study designs that a researcher may implement. Modern psychological research methodology focuses on a multi-method approach, combining the strengths of idiographic research (such as case studies) with the power and causality of nomothetic approaches (true experiments and quasi-experimental designs). The hallmark of a true experiment is random assignment—that is, assigning comparable individuals to one of several experimental conditions in addition to a control condition where no intervention
Despite the known drawbacks to Freud’s methodology, his theory also suffers from historical criticism because of his social and historical milieu. Interviewing young women labeled “hysterical” in the late 19\textsuperscript{th} and early 20\textsuperscript{th} centuries, Freud was invariably influenced by the prevailing cultural mores regarding gender and sexuality. The young women who came to Freud for relief from their troubling symptoms more often than not recounted troubling sexual fantasies that, though disconcerting, may be dismissed by today’s clinicians as benign. The question can be raised, however, about Freud’s patients: did they possess true psychological/somatic abnormalities, or did their society’s reticence regarding issues of sexuality produce their pathology?

Standpoint theorists operate from an epistemology that is quite radical relative to established scientific practice, arguing that all knowledge is “socially situated.”\textsuperscript{23} Yet this does not mean that there is no “true” measure of the external world and that we are forever consigned to relativism; instead, Harding argues that “it turns out to be possible ‘to have simultaneously an account of radical historical contingency for all knowledge claims and knowing subjects, a critical practice for recognizing our own ‘semiotic technologies’ for making meanings, and a no-nonsense commitment to faithful accounts of a ‘real’ world.’”\textsuperscript{24} This action is undertaken by creating a more rigorous conception of objectivity, which at present is limited by the fact that is used. Random assignment ensures that each participant has an equal statistical chance of being in each condition, which balances individual differences across these conditions. A quasi-experimental design would also use separate groups of participants, but these groups may be nonequivalent or preexisting (for instance, testing the performance of one classroom against another, when students may or may not have been randomly assigned to classes). The weakest study design, establishing no causation and only mere correlation, is a one-group pretest-posttest design.


\textsuperscript{24} Ibid.
“scientific method can[not] detect sexist and androcentric assumptions that are ‘the dominant beliefs of an age.’”

Standpoint theorists hope to remove these scientific ‘blinders’ by drawing attention to the way in which methodology is influenced by a researcher’s entrenchment in culture and appreciating it, rather than trying ineffectively to eliminate it. No longer, say standpoint theorists, must we treat scientific findings as gospel.

Feminist standpoint theory is contradicted by another school of feminist philosophers, the spontaneous feminist empiricists. Approaching the problem from another angle, these philosophers “try to fit feminist projects into prevailing standards of ‘good science’ and ‘good philosophy.’” While this more conservative approach to problematizing current scientific methodologies may be appealing, standpoint epistemologists argue that empiricists “[refuse] fully to address the limitations of the dominant conceptions of method and explanation and the ways the conceptions constrain and distort results of research and thought about this research even when these dominant conceptions are most rigorously respected.”

Standpoint theorists call into question not only the answers that science produces, but the method by which those answers are obtained.

How does this all relate to psychology, when the feminist philosophers of science have chosen instead to focus their energy on the natural sciences? The social sciences, too, use the Baconian scientific method to gather evidence and inform preexisting theories about human thought and behavior. Feminist standpoint epistemology, then, will be equally useful in defending the application of strong objectivity in the social sciences.

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26 Ibid., 239.
27 Ibid.
While George Howard may or may not consider himself a feminist standpoint epistemologist, he presents arguments for the inclusion of value systems in psychology, arguing that since the subjects of psychological research (humans) are fundamentally different from the subjects studied in other disciplines, the current methodology needs to be adapted to this unique situation. Given his claims for the inclusion of both epistemic and nonepistemic values, Howard would probably agree that the Baconian method artificially forces “the subject of knowledge [to be] homogenous, unitary, and coherent.”

Surely, human subjects, representing a wide range of cultures and influenced by diverse personal experiences, are anything but.

Howard paraphrases the standpoint epistemologists’ call for strong objectivity by arguing epistemic values should guide our judgments regarding the determination of the adequacy of competing theoretical explanations. Although nonepistemic values can play a role in determining what questions one might choose to entertain, it is felt that nonepistemic values should not intrude on the scientific process of determining the relative merits of competing theoretical explanations.

But Howard is careful, it appears to stay on the fence when it comes to completely jettison the Baconian method—agreeing, by quoting Ernan McMullin, that one of the ‘founding fathers’ of the scientific method was correct “to view emotive values…as potentially distortive ‘Idols,’ projecting in anthropomorphic fashion the pattern of human wants, desires, and emotions on a world where they have no place.” But Howard separates these nonepistemic values, which continue to “influence many important aspects of research in psychology,” from epistemic values.

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30 Ibid., 256.
values—“those criteria employed by scientists to choose among competing theoretical explanations.” 31 Howard criticizes approaches to psychology, and indeed any scientific discipline, that try to extricate any and all values. Such work is necessary futile, since “the objectivity of sciences must be understood as emanating from a nexus of judgment presuppositions, and the efficacy of the entire enterprise is a function of the adequacy of those fundamental assumptive stances.” 32 Indeed, science without value judgments regarding which theories best incorporate the available empirical evidence would be no science at all, since there would be no way to definitively champion one theory as being superior to another. Human discovery would stagnate as both natural and social scientists were forced in absolute relativism, conceding that each and every theory, no matter how inelegant, has a right to be taken seriously.

But Howard also highlights another reason why psychology, in particular, must incorporate values—reflexivity, also known as reactivity or experimenter effects. He cites British philosopher Stephen Toulmin, who “captured a sense in which psychology as science needs to confront the problem of reflexivity when he pointed out that in the era of classical science, as exemplified by Newtonian physics, an object of study never knew it was being studied.” 33 The notion of psychological research as transparent and voyeuristic, in no way influencing the present (and future) behavior of its participants, is, according to Howard, patently false.

Reactivity or experimenter effects are well documented in psychology, legitimizing deception and other clandestine experimental techniques in order to elicit truthful responses from subjects, especially when the subject matter is very personal or considered a social taboo. Any

32 Ibid., 258.
33 Ibid., 260.
and all deceit on the part of a researcher is first cleared through the research organization’s institutional review board to ensure that participants will not be harmed in any way by the deception. Such clandestine methods must also be used sparingly—if there is another way to perform the same study without using deception, then that route must be taken. Also, after each experiment, participants are debriefed on the study’s purpose, ensured of the confidentiality of their responses, and given relevant contact information for the researchers. All of these measures are to mitigate any ill effects that may be a result of the deception or other study methodology, such as artificially lowering participants’ self-esteem to study its effect on another personality variable or a cognitive task.

In highlighting reflexivity as a possible unique challenge for psychology, Howard notes that this problem should concern researchers not only in the short-term of their data collection, but also in the long run, because it

cuts deeper still and is concerned not only with how our behavior is altered because we are being studied but also with how the results of studies can alter our behavior in nonexperimental contexts. Human beings care about the findings of psychological investigations. Because we care, research results might precipitate changes in humans’ behavior.34

This discussion of which came first, the phenomenon or the research supporting it, has the potential to bring any of the social sciences to a screeching halt. As explained previously, true experimental design, properly employed, brings with it the assurance of causal interpretation. Yet Howard has asserted that reflexivity may challenge this central assumption—“We have come full circle,” he says, “when we consider that in viewing themselves in this particular

manner, humans might actually become more like the model because they have reason the expect that they will act in accord with the scientific evidence.”35 This insight has the power to challenge so-called “classic” findings within the discipline, as researchers can now scrutinize the standards of experimental design as well as the reporting of significant results.

Taking another look at Freud’s theory of psychosexual development, it is possible to impose this framework of reflexivity on his young, hysterical patients. Today, clinicians may assure similar young women that sexual fantasies about family members, though disturbing, are relatively normal and can be viewed without alarm. Because such fantasies have been “normalized” or at least partially legitimated by our contemporary culture (though not encouraged, as incest is still taboo), persons experiencing them are no longer alarmed to the point that they can no longer function in their daily lives.

Though Howard and others have paid considerable recent attention to reflexivity as a force to contend with in contemporary psychological research, it is not the only influence that researchers must worry about when designing studies or documenting research for publication. Another equally or perhaps more potent force with which psychologists struggle is language.

Linguists have long studied the relationship between human language and behavior. Two competing psycholinguistic theories of the relationship between language and behavior have garnered attention. The so-called “strong theory” of linguistic relativity (the Sapir-Whorf hypothesis), developed by Edward Sapir (1941/1964) and Benjamin Lee Whorf (1956), hypothesizes that one’s actions, thoughts and behaviors are wholly determined by one’s language.36 Subjects theoretically would not be able to interact with objects in their environment

for which their language had no representation. The “weak” version of linguistic relativity, however, only postulates that language influences actions and thoughts, not determines them. As such, the words used to describe objects, while arbitrarily associated with the physical objects they stand for, have properties that affect behavior. Howard notes that language must be taken seriously as a component of reflexivity, remarking, “[T]he active agent approach holds that the things humans say to themselves are important causal elements in the genesis of behavior.”

This is not to say, however, that observable human action is wholly determined by one’s internal monologue. My act of writing these words is due only in part to the fact that I thought out the sentence beforehand; I could also have chosen not to type it after thinking. Nevertheless, language must be given a prominent place in any discussion of science, not simply psychology; “any discussion of human reflexivity begins with a consideration of language as the mechanism underlying the operation of the phenomenon and ends with the role of values in steering reflexive human action,” and standpoint theorists have shown the prominent place that language occupies in the methodology used in all scientific disciplines.

For instance, much scholarly and public attention has been paid to the idea of political correctness in the last 10 to 15 years. The cultural shift towards increased sensitivity to the connotations of a given word directly supports the linguistic relativity theories. One study found that when asked to describe a generic person, children of both sexes who encountered the generic noun “man,” which has been used to refer to men, women, and mixed groups, were more likely to draw a male figure than a female one. Efforts to equalize the use of gendered pronouns in

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38 Ibid., 261.
39 Additional studies have focused on the sex-roles portrayed in children’s literature, with the findings that most stories teach young children that a woman’s proper place is in the home.
academic writing and even everyday prose can help to balance children’s (and others’) representations of what kinds of people are capable of certain occupations and activities. Of course, recent scholarly attention is not the first time that issues of gender in language have been explored. One group of feminist philosophers, the so-called French feminists, has explored this topic greatly, and the group’s theories of gender and language have profound implications not only for psychology but also for the whole of science.

Hélène Cixous, Luce Irigaray and Julia Kristeva have “explored the idea of a female language rooted in pre-Oedipal experience.” These theorists, particularly Kristeva, discuss two distinct orders, the semiotic (feminine) and the symbolic (masculine) and rely on Freud’s (and his successor, Lacan’s) theories of psychosexual development in order to explain female subordination in patriarchal society, as well as the traditional conflation of masculinity and objectivity. The semiotic order roughly corresponds to the time in an individual’s life before the attainment of what could be considered actual language—before the resolution of Freud’s Oedipal (for males) or Electra (for females) crisis in which the Freudian ego develops. The French feminists do not necessary challenge the Platonic myth of the cave, of the matter from which nature is made (the chora) as being inherently messy and unusable until it is formed and made good through actions that are gendered masculine, but rather seek to adapt this story to suit their purpose of explaining the separation that patriarchal society has imposed between the semiotic and the symbolic.


Theorizing about human existences prior to the development of language is inherently problematic and speculative, however, since any record of human existence is based on linguistic representation—there is no true prehistory because there was little to no sense of civilization before the development of language, or at least none that could be recorded for future generations to discover and interpret. Similarly, the development of autobiographical memory typically corresponds to the point in human development at which Freud, Lacan, and current psychoanalytic theorists place the Oedipal and Electra complexes—before the attainment of language, children typically have little to no retrievable memory that survives the transition from the pre-language time to post-attainment. For Irigaray, this fact exemplifies how the present symbolic order renders femininity “repressed due to its being essentially unrepresentable. This results historically in femininity’s being understood according to masculine models, that is, as deficient masculinity, or as masculinity’s (inferior) opposite or complement.”

If modern language cannot make sense of femininity, represented by the chora or semiotic, it will remain devalued or wholly ignored. While this reluctance or inability to discuss the contents of the semiotic may not necessarily be interpreted as a value judgment, it often is within contemporary patriarchal society.

Rather than focusing on Freud’s interpretation of biology, which is largely deterministic and centers around the child’s sex (and relationship with the opposite-sex parents) as central in psychosexual development, Lacan instead centered “his primary emphasis…on the role of language and the symbolic order in regulating society and subjectivity, and he resisted

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vigorously any explanations which rested on biology [as Freud did].”  
Irigaray and Kristeva have appropriated the Freudian and Lacanian notions of “women as always and inevitably the other;”  
using this framework, each author has crafted techniques for making the feminine more visible.

Irigaray notes the “relationship between bodies and discourses” in proposing her theory of female embodiment. To her, “the body is never simply ‘natural’, for Irigaray; rather, it enacts and is acted upon by a range of both biological and socio-linguistic forces;” the relationship between language and the physical world is indivisible. Kristeva proposes two spheres of linguistics to account for masculine and feminine subjects in language: “the semiotic and the symbolic.” In this theory, Kristeva argues that “the semiotic is the material representation in language of our bodily origins and unconscious drives and desires that the symbolic attempts to mask or efface with the illusion of mastery and univocal semantics.” Healthy individuals will necessarily move from the semiotic to the symbolic as the growing child begins to understand that there is a distinction between “me” and “not me”—the separation between the primary caretaker (often the mother) and the child. Keller comments that this a transition in which “the child gradually gains enough confidence in the enduring reality of both him/herself and the environment to tolerate their separateness and mutual independence.” If this transition is aborted or otherwise rendered unsuccessful, the child may find himself lost between the two

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43 Ibid.
46 Ibid., 85.
47 Ibid., 85.
spheres, unable to fully differentiate from mother while simultaneously misunderstanding that they are separate autonomous persons. Other complications may arise if the child does not transition at all and remains in the semiotic—“[t]he ground of one’s selfhood was not easily won, and experiences that appear to threaten the loss of that ground can be seen as acutely dangerous.”49 Either way, a successful transition from the semiotic fluidity of the mother-child union ensures that the child can embrace the symbolic order and acquire a sense of autonomy, agency, and masculine language.

Yet this is just the first step. Once the child has grasped autonomy, she must reconnect with the semiotic order, but in a limited fashion, or else risk the psychological trauma of an incomplete relationship with mother, and never again reconnecting with the semiotic. Again, Keller notes that it is this “dual character of the separation-individuation process—a process leading not only to the recognition of self as different from other, but also to the ultimate recognition of the other as subject like oneself”50 that allows the child to reconnect with the semiotic. Psychologically healthy individuals are those who are able to successfully integrate these two distinct orders. Kristeva refers to poetic language as “[t]he type of language that overtly subverts mainstream conventions…a discourse that refuses to reduce the available systems of signs to communicational vehicles by suspending the rules of logic, truth, consciousness and identity, and where meaning is never localizable to the extent that it is nowhere and everywhere at once.”51 As we have seen, however, the language used in scientific discussion is anything but poetic, blatantly betraying a patriarchal and masculinist conception of

50 Ibid., 106.
the relationship between nature and science. It has yet to be seen how scientific inquiry, or society in general, would be different if Kristeva’s poetic language was implemented in mainstream, everyday speech.

Aside from the more abstract ways in which the French feminists have articulated the ways in which language is gendered, contributing to children’s psychological development, specific inquiries have been made into the language at work within purportedly “value free” scientific texts to reveal the gender processes at work in the domain of established research. One of the most notable discussions revealing the bias in supposedly neutral science texts is Emily Martin’s lengthy evaluation of the gendered way in which reproductive mechanisms have been described in scientific textbooks. In “The Egg and the Sperm: How Science has Constructed a Romance Based on Stereotypical Male-Female Roles,” the damage that can be done by adhering to standards of objectivity that are not rigorous enough becomes strikingly clear.

Martin turns her attention to scientific literature not as someone trained in the natural or biological sciences, but as an anthropologist; it would appear that since biologists, reproductive endocrinologists and other specialists are too entrenched to be able to scrupulously question the popular conceptions of how biological processes are thought to work. Indeed, the fact that Martin highlights the gender stereotypes within a textbook is particularly troubling, since students often lack an appropriate depth of knowledge to be able to critique what they are reading, focusing instead on learning what they believe to be accurately presented material.

Systematically, Martin delineates the ways in which the male and female reproductive systems have been anthropomorphized—sperm are seen as active pursuers of the egg, which
passively “‘drifts’ along the fallopian tube.” These characterizations undoubtedly rely on preconceived notions regarding the dynamics of male-female interaction: the egg is portrayed as the damsel in distress, listlessly waiting for her sperm Prince Charming to come and find her. His heroic action—fighting his way up the vaginal canal, through the uterus, and up the fallopian tube, underscores his dedication to the cause at hand; each particular sperm must be valiant in his effort, competing against possibly millions of other sperm for the chance to “‘burrow through the egg coat; and ‘penetrate’ it.”

Thinking about this characterization for even an instant, however, reveals its ridiculousness. As quiescent cells, sperm and eggs are unable to will their actions, nor do they act in gendered ways. There is nothing “feminine” about an ovum nor “masculine” about a sperm, save the fact that each is produced by differentially gendered bodies that happen to have either an XX or XY set of chromosomes, respectively.

Martin continues her analysis of the gendered stereotypes at work in textbook publication by documenting new research that has contradicted the accepted mechanisms by which sperm and egg fuse to create a zygote. She discusses experiments being performed both in the U.S. and abroad that show the active role that the egg plays in fertilization, and the inefficiency with which sperm move through their environment. Many of these experimenters, however, are unable to completely remove themselves from the established sex role paradigm, and are only partially successful at extricating these underlying assumptions from the publication of their research.

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53 Ibid.
54 Ibid.
This discussion of sexual innuendo in scientific literature, and of individuals who are able to fully integrate the semiotic and symbolic, brings us back to the beginning, with our discussion of Descartes and Bacon. In making so forcefully the self/other distinction, it would appear that neither of these great thinkers was fully able (or willing, perhaps) to reintegrate the semiotic with the symbolic. What results is the insistence on dispassionate, disconnected encounters with nature, through subordination and other assertions of power and dominance.

These are the theories that underlie our current understanding of science. By exploring the foundations of the modernist scientific method, it becomes possible to better understand the prominent role that science and scientific inquiry plays in today’s society. However, this prominence has not gone unquestioned by feminist philosophers of science.

While discussion regarding the scientific method is usually aimed at explicating the challenges presented for those in the natural sciences, I have sought to expand and develop this line of reasoning in order to make it more applicable to the social sciences as well, particularly psychology, which focuses almost entirely on human subjects. Because of this anthropocentric (and sometimes androcentric) approach, psychology can be greatly informed by an overview of the ways in which values can and should interact with existing methodologies. As portrayed in the Martin piece however, merely being informed of stereotypes present in one’s academic discipline is far from enough to root out any and all biases in the literature. But increased awareness of these biases, brought to the forefront by standpoint epistemologists and other feminist philosophers of science, has at least opened the door to a more rigorous conception of objectivity. Vigilance, however, will be required of all who interact with science, from the producers (the researchers) to the consumers (the general public), in order to fully realize that conception.
Bibliography


