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**A FEMINIST EPISTEMOLOGICAL FRAMEWORK: PREVENTING
KNOWLEDGE DISTORTIONS IN SCIENTIFIC INQUIRY**

by

KARINA MARTINS BUCCIARELLI

**SUBMITTED TO SCRIPPS COLLEGE IN PARTIAL FULFILLMENT OF
THE DEGREE OF BACHELOR OF ARTS**

PROFESSOR SUSAN CASTAGNETTO

PROFESSOR RIMA BASU

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INTRODUCTION

Growing up, as I was taught basic biology, chemistry, and physics in elementary, middle and high school, I learned about how foolproof the scientific method is. Western, traditional scientific inquiry is set up in such a way that there should be minimal influence of cultural and social biases in what we take to be scientific knowledge. That the scientific method is set up to correct for biases and cultural beliefs. I have come to find this to be false as many knowledge claims which we take to be scientific are, in fact, deeply embedded with problematic ideas of gender conceptions that distort the knowledge claim. Perhaps scientists are trained to engage with these problems of bias within formal scientific inquiry, but it remains clear that we still lack a widespread, systematic understanding of how our knowledge is influenced by cultural and social contexts. Thus, I turn to feminist epistemologists to critically question traditional, western frameworks of knowledge inquiry in order to engage with a new type of knowledge inquiry that is less prone to distortions due to socially constructed conceptions about gender.

As context, it is important to note the ways in which women and individuals from other marginalized communities have been, historically, excluded from formal, scientific inquiry. “Western societies have labeled” scientific knowledge inquiry as “‘masculine’ and prevented women from acquiring and producing it, often on the pretext that it would divert their vital energies from their ‘natural’ reproductive labor” (Anderson 50). As I examine how knowledge can be distorted due to problematic cultural assumptions about gender, it is important to note the structural barriers that

are in place for the promoting knowledge inquiry with diverse participation of inquirers.

Although I am not going to discuss this in great detail, it is important to touch briefly on which framework of feminism I am using. My main framework comes from bell hooks, in *Feminism is for Everybody*, wherein she explains that “feminism is a movement to end sexism, sexist exploitation, and oppression” (hooks viii). Importantly, hooks doesn’t equate sexism with oppression, rather states that ending all oppression and sexism is a part of feminism. As it will be explored, the ways that our knowledge claims can be distorted serve to uphold systems of oppression that work to benefit those in power.

Susan Sherwin provides another framework of feminism that is specifically relevant when considering how scientific inquiry can be distorted due to problematic gender stereotypes. Sherwin writes that feminism is about “changing the nature of power structures in the world, moving from structures that grant some people power over others to alternative social arrangements, which foster universal access to personal power” (Sherwin 33). Therefore, according to Sherwin, feminism and investigations of feminist epistemologists are designed not to promote any identity over another but rather creates frameworks of inquiry wherein we can dismantle systems of oppression and allow all people to access their own personal power to their fullest capacity. I will use Sherwin’s framework in order to engage in knowledge inquiry free of distortions due to widespread, cultural beliefs, and posit that there are three criteria that should be a part of formal and informal knowledge inquiry.

I will first explore the various ways that scientific inquiry may produce distorted knowledge due to problematic social perceptions about knowledge and how these maintain systems of power by perpetuating dominant narratives. I will first engage with traditional, western definitions of scientific inquiry. I will then explore the example of an explanation of human fertilization as a distorted knowledge claim due to problematic social perceptions about gender. By entering into conversation with feminist epistemologists about ways to restructure knowledge production, I will attempt to understand whether we must systematically restructure formal inquiry or apply it with more precision. I will also consider the role that values play within inquiry and how we can make active decisions based our individual value commitments, specifically feminist values. I will argue that in order to pursue knowledge that is less distorted due to gender biases 1) we must critically examine the knower in relation to what they know, 2) make efforts to diversify inquirers within knowledge inquiry and 3) acknowledge the role that values play in inquiry, and allow for active decisions to be made about values. In order to pursue this project, I have six main sections.

In Section 1, I explore a foundational western, traditional definition of science. This framework leaves us wondering how we engage with knowledge claims that are distorted due to widespread cultural beliefs. In Section 2, I examine how gender has influenced explanations of human fertilization and how this distortion of knowledge complicates the traditional, western framework presented in Section 1. We are then left with a question about whether the framework of inquiry fails in this particular case of if it gives rise to a larger, systematic concern. Thus, in Section 3, I

turn to feminist epistemologists who take on issues of traditional western frameworks of knowledge inquiry. Namely, evidence-based inquiry (empiricism) and the question of objectivity. Feminist epistemologist Sandra Harding presents a comprehensive argument about the role of the inquirer in relation to the content of knowledge.

Therefore, in Section 4, I explore the relationship between the knower and what they claim to know, turning to Sandra Harding and standpoint epistemology to provide an account of a new form of objectivity. I will explore standpoint epistemology in depth in that section as well. I also focus on the importance of a diverse group of inquirers as a means to minimize problematic biases that affect knowledge inquiry and maximize objectivity. We are then left with the question about what we can do when we realize that our inquiry is skewed due to widespread, dominant cultural beliefs. In Section 5, therefore, I consider what it means to acknowledge values as an integral part of scientific inquiry, and in doing so reject value-free science. I also argue that if we acknowledge values as a part of scientific inquiry, we can make decisions based on values we would like to uphold, particularly feminist values as they work to dismantle oppressive systems and question knowledge frameworks that are in place that uphold these systems. In Section 6, I explore an objection to my framework of inquiry presented by Susan Haack wherein she argues that feminist epistemologists are mischaracterizing knowledge inquiry and should, instead, focus on solving distorted knowledge claims by ensuring that inquiry remains evidence-based and value free. Ultimately, however, I stand by my argument that if we 1) critically and systematically examine the knower in relation to what they know, 2) make efforts to diversify inquirers and promote marginalized perspectives as well as 3) acknowledge

the role that values play in inquiry and promote feminist values, then we will be engaging in knowledge inquiry that is best suited to produce undistorted knowledge.

SECTION 1: A FRAMEWORK OF TRADITIONAL SCIENTIFIC INQUIRY, LASTRUCCI

In this section I will explore a definition of traditional, western scientific inquiry as presented by Carlo Lastrucci. By first understanding the key components of the definition we will then be able to examine where knowledge inquiry is failing when knowledge claims are distorted due to problematic dominant beliefs about gender roles. Carlo Lastrucci, a psychologist and researcher at San Francisco State College, explored the definition of science and importance of the scientific method in his book, *The Scientific Approach; Basic Principle of the Scientific Method*. Although Lastrucci's book is not widely cited, it is integral in how it condenses information from a multitude of textbooks and sources to create an overarching, comprehensive definition of science. For the scope of my project, Lastrucci's work provides an important definition of western, modern scientific inquiry. In order to understand where the process of scientific inquiry fails to produce knowledge claims free of cultural and social influence due to gender (and other) biases we must first engage with *what* scientific inquiry is and *how* the process of inquiry promotes knowledge claims free of distortions.

Carlo Lastrucci focuses specifically on scientific inquiry and the criteria for considering something to be science. Importantly, to Lastrucci "science is a method, not a philosophy" (Lastrucci 30). Therefore, Lastrucci's definition of science is about the scientific method. Science is an exemplary case of knowledge inquiry as it is the

premier example of correcting for biases and promoting objectivity. In this project, therefore, I use scientific inquiry as the paradigm for what should be generating undistorted knowledge claims.

Due to the way “science” is operationalized in our everyday usage of the term, Lastrucci states that, “it seems appropriate to define the term “science” in a combination of three ways (a) analytically – i.e., in terms of its essential and distinctive component attributes, (b) functionally – i.e. in terms of the services it performs, and (c) operationally – i.e. in terms of the processes or operations performed when practicing it” (Lastrucci 6). Here, it is clear that Lastrucci’s definition will engage with the definition of science as a method.

Lastrucci claims that an extensive examination of standard books about science shows a general consensus among “authoritative writers” with regards to the “essential attributes and processes of science” (Lastrucci 6). According to this consensus science can be defined as: “an objective, logical, and systematic method of analysis of phenomena, devised to permit the accumulation of reliable knowledge” (Lastrucci 6). Lastrucci explains each of the key terms of this definition of science: “objective,” “logical,” “systematic,” “method,” “phenomena,” “devised,” “accumulation,” and “reliable.” For the purpose of my analysis, I will focus on his explanations of the terms “objective”, “logical”, “systematic”, “phenomena”, and “reliable” as these are key components to understanding where scientific inquiry can produce knowledge that is distorted due to problematic cultural assumptions, particularly in regards to gender. In this section, I will expand on each of these terms and why they are important components of formal knowledge inquiry. In Section 2, I

will tie Lastrucci's key terms to a discussion of human fertilization as an example of a knowledge claim that is distorted due to widespread, problematic cultural stereotypes about gender.

The first key term that Lastrucci explains is *objective*. Lastrucci states that objectivity “refers to attitudes devoid of personal whim, bias or prejudice, and to methods centered around ascertainment of the publicly demonstrable qualities of a phenomenon” (6). He argues that knowledge claims should be “publicly demonstrable” as science should be available to any “interested and competent person,” not just a “favored few” (Lastrucci 6). Thus, Lastrucci claims that objectivity requires that the knowledge claim be accessible, demonstrable and corroborated by the larger scientific community. Lastrucci further explains that “objectivity in science denotes an impartial viewpoint which refrains from inferring or implying that any phenomenon is ‘good’ or ‘bad’ *per se*” (7). Lastrucci affirms that scientists follow the scientific method to avoid that their inquiry be influenced by self-interest or personal beliefs and that they work on taking a view from ‘no-where’ such that their personal prejudices don’t affect the knowledge content.

The second key term that Lastrucci defines is *logical*. Science is a “systematic arrangement of facts, theories, instruments and processes—all interrelated by principles of reasoned thought” (Lastrucci 9). These principles string together scientific claims and are reasoned through logic, thus making science a logical process. Lastrucci states that, “since science is a logical system, it is also self-critical i.e., it contains within its methods the tools for its own analysis” (Lastrucci 10). Particularly, because scientific claims are (and historically have been) proven false,

scientists must constantly check for failures by surrounding themselves with “a cloak of critical doubt” (Lastrucci 10). Here, Lastrucci makes it clear that this “cloak of critical doubt” is a fundamental component of scientific inquiry such that scientists constantly check for potential false knowledge claims as a way to be critical of their own method. Importantly, Lastrucci makes it clear his discussion of *logical* that he is operating under two main principles. The first, that knowledge is somehow “out there” such that through well-reasoned principles we are able to understand how our facts, theories, instruments, etc. connect. The second, is that scientists, as individuals, are responsible for constantly checking knowledge for possible failures. Nonetheless, in Lastrucci’s definition of *objective*, it is clear that an important component of inquiry is having the knowledge claim be accessible to a community of knowers. Therefore, although the onus is on the individual scientist to be constantly checking for false knowledge claims, it is also assumed that the same knowledge claim is corroborated by the larger scientific community.

The third key term that Lastrucci’s defines is *systematic*. Lastrucci explains that science proceeds in an “orderly manner both in its organization of a problem and in its methods of operation. It does not proceed randomly or haphazardly” (10). All scientists that recognize and practice the scientific method use the same “basic rules of evidence and reasoning in order to validate their conclusions” (Lastrucci 11). Science, therefore, is a systematic approach to inquiry that is replicable and minimizes errors. Thus, if science, is systematically producing distorted knowledge claims, then we must somehow adjust the *system* of inquiry such that we can continue to rely on its outcomes (reliability will be taken up later on).

The fourth key term that Lastrucci examines is *phenomena*. The scientific method, Lastrucci explains, is applicable to “any kind of behavior or event that has objectively demonstrable attributes or consequences” (Lastrucci 12). Lastrucci further explains that science:

...is objective insofar as it studies phenomena having behavioral attributes or consequences. If something exists or occurs having such attributes that it can be objectively ascertained and confirmed, then it can be studied scientifically ... for example, a presumably subjective behavior (say, a dream) cannot be studied scientifically until and unless it can be shown to exhibit objective attribute or consequences. (Lastrucci 12)

Lastrucci’s analysis of phenomena is tied to his discussion of objectivity such that if you are able to understand and conceive of something objectively, then it is a phenomenon that you can study with the scientific method. Although a vague definition of phenomenon, one thing made clear is that someone, namely the scientist, needs to *decide* what it means for the perceived phenomena to be considered objective.

The final component Lastrucci explains is *reliability* or *reliable* knowledge. Lastrucci states that science is reliable as it involves the “kind of knowledge which one can depend upon in terms of predictability. In this sense, then, reliable knowledge is synonymous with exact or correct knowledge” (16). Lastrucci makes it clear that knowledge produced through the scientific method is correct or exact because it serves as a means to predict future events/phenomena. Recall the discussion about the term *logical*, wherein Lastrucci states that scientists should investigate knowledge

claims with “a cloak of critical doubt.” Interestingly it seems that Lastrucci sets up a framework in which knowledge is simultaneously taken to be correct and fallible. This apparent contradiction lays in that scientific knowledge is reliable as it predicts future events, yet as a logical system scientific inquiry must also have measures in places to be self-critical. Therefore, insofar as knowledge claims are able to predict future events we can consider them to be correct or exact but we must ensure that we are always critical of the content of knowledge.

In this section, I have provided an account of scientific inquiry as presented by Lastrucci. I explored the main components of Lastrucci’s account of scientific inquiry– “objective,” “logical,” “systematic,” “phenomena,” and “reliable knowledge/reliability.” I also provided a brief explanation of each key term and what it provides for the larger context of the definition. Here, I will quickly recap each of the key terms of the definition as they will be important in the following section. Objectivity assumes that personal bias, prejudices, whims, etc. will be left out of knowledge inquiry. Logical asserts that our facts, theories, etc. are interrelated through principles which are established through well-reasoned thought. Lastrucci also establishes an expectation that scientists, through a “cloak of critical doubt,” will be continuously critical of their findings. Systematic means that scientific inquiry is always replicable and practiced as a system, making it clear that if there is a persistent issue systematic issues to knowledge inquiry then there must be a systematic shift in the way inquiry is conducted. Phenomena is the behavior or event that is considered objective such that it can be studied. What is considered phenomena is decided by scientists themselves based on whether that phenomena can be objectively studied.

Lastly, reliability or reliable knowledge confirms that we can trust knowledge acquired through scientific inquiry as correct or exact since it we can depend on its predictability.

So far, I have provided a comprehensive definition of scientific inquiry, emphasizing key components. In the following section, I will present an example of human fertilization which a moment in which knowledge can be distorted due to problematic cultural assumptions about gender. I will then turn to Lastrucci's discussion of the scientific method to assess how we engage with distorted knowledge claims due to problematic cultural biases within this traditional epistemological framework.

SECTION 2: GENDER BIAS IN THE EXPLANATION OF HUMAN FERTILIZATION

In this following section, I will explore what it means that knowledge is, often, influenced by problematic cultural beliefs in ways that western, modern scientific inquiry, as described by Lastrucci, does not provide us with the tools to engage with. In order to analyze how scientific inquiry is failing, we need to first understand how beliefs about gender can distort our knowledge claims. I will use the description of human fertilization to show how scientific knowledge claims can be influenced by problematic cultural beliefs about gender. We are left questioning whether the distorted knowledge claim about fertilization is an issue with the way that scientific inquiry was performed in this particular case or if it is indicative of a larger systematic issue.

Spanier, in “Im/partial Science: Gender Ideology in Molecular Biology,” explores distortions of representation of reproductive cells and fertilization. Spanier explores how gender stereotypes have permeated discussions of fertilization in the first edition of the introductory textbook *Molecular Cell Biology* published in 1983 (59). The description in the textbook provides the learner with an image of a passive egg and an active sperm, crediting the fertilization to the ejaculation of the sperm with little mention of the participation of the egg (Spanier 59). The visual invoked is of the sperm doing all the work, from travelling to and penetrating the surface of the egg. In this representation, however, key scientific facts are omitted (Spanier 60). Within the biologically female body, the vaginal contractions and “sweeping waves of cilia lining the fallopian tubes” are vital to the sperm reaching the egg. Furthermore, the language of “penetration” of the sperm into the egg’s membrane is inaccurate as the “fusion of the egg and sperm membranes” involves a secretion from the female reproductive tract to activate the sperms enzymes (Spanier 60). Using terms such as “penetrate” creates a visual wherein the sperm is given sexualized imagery, namely of “a being with a penis” (Spanier 60). Thus, there is a superimposing of gender stereotypes, of the passive female and the active male, onto the biological process of fertilization (Spanier 61).

The influence of cultural beliefs on scientific explanations, like fertilization, is not uncommon and has been widely documentedⁱ (Spanier 61). Spanier emphasizes that representing the process of fertilization through the use of gender stereotype can inadvertently affect our knowledge of “nature” and what we think is an accurate depiction of a natural process (61).

Critically examining how the process of fertilization is explained allows for an understanding of how gender stereotypes have a deep, and often unnoticed, influence in what we take to be knowledge. Without Spanier's detailed analysis of the active role the egg plays in gamete fusion, a role that is even more active than that of the sperm's, most people (like myself) who were taught in a similar way to the explanation in the *Molecular Cell Biology*, would continue to believe a false scientific representation of fertilization. Spanier's explanation of human fertilization and analysis of how fertilization has been falsely represented shows us how deeply ingrained sexist and androcentric views can be in our knowledge inquiry. Thus, the gendered representation of knowledge in this example prevents us from *knowing* the actual complex interactions that occur in fertilization from both the sperm *and* the egg.

Now that I have briefly presented and explored the way that gender stereotypes can influence knowledge and how it often goes unnoticed, I will examine how the example of fertilization stands in relation to Lastrucci's definition of scientific inquiry. As Spanier presents it, it can be assumed that research on the process of fertilization adhered closely to the scientific method (Spanier 60). Thus, the problem lays in how the influence of gender stereotypes distort knowledge content even when adhering closely to the scientific method. It is clear, therefore, that we must re-examine Lastrucci's definition of scientific inquiry as to reexamine how problematic, cultural perceptions of gender can distort knowledge claims.

First off, the example of human fertilization distorted by cultural assumptions about gender calls into question Lastrucci's emphasis on objectivity. It seems that the

influence of problematic assumptions about gender roles on knowledge inquiry allowed for false (and presumably 'non-objective') "facts" to be relayed. It is important to note that Lastrucci's definition of objectivity states that science or scientific knowledge is "objective" such that it isn't influenced by personal prejudice or bias. If we take Lastrucci's definition of objectivity, then the knowledge claim about human fertilization fails to be objective as it is clearly influenced by stereotypical gender roles of the passive female and the active male. Although Lastrucci seems more concerned with personal prejudice or bias rather than widespread cultural beliefs, this example makes it clear that widespread cultural biases or prejudices can have damaging effects on the content of knowledge claims. Therefore, it seems that Lastrucci's definition of objective fails to engage with instances where all people within that scientific community share the same biases. Therefore, the example of fertilization sheds light on our need to expand the definition of objectivity as presented by Lastrucci to consider culture-wide biases.

Another term that is brought into question is phenomena. In example of human fertilization, a decision was made about what was considered a part of inquiry such that we could conceive of its objectivity. It seems, however, that, connected to my concerns about objectivity, the example of fertilization brings into question our ability to separate phenomena from cultural context and social influence such that it can be studied objectively. It seems that our ability to distinguish between phenomena and cultural context is questionable as they are so deeply imbedded in one another.

The explanation of human fertilization as distorted knowledge due to problematic assumptions about gender roles, brings up questions about the *reliability*

of knowledge claims. As Lastrucci defines it, science should be *reliable* such that we are able to base principles and theories on one another, trusting that knowledge inquiry produces accurate knowledge content. However, we cannot base any other knowledge claim on this description of fertilization as it is distorted and false. Thus, because knowledge inquiry of human fertilization adhered closely to the scientific method yet still produced distorted knowledge claims, calls into question the method as a whole.

A further aspect of Lastrucci's definition that the example of human fertilization fails to meet is *systematic*. The scientific method is set up in such that it is performed in the same way by different scientists. However, distortions in the explanation of fertilization were systematically accepted until Spanier pointed out the role of the egg scientifically. Even though scientists studied fertilization in the same, presumably reliable systematic inquiry, due to the social conditions and context with which it was studied, the interpretations of the phenomenon continued to be influenced by problematic conceptions of gender. The self-critical component of inquiry namely, "the cloak of critical doubt" should have engaged in a revision process to check for false knowledge claims; however, because the scientific community shared in this social conception of gender roles, the self-critical component as not sufficient.

In this section, I assessed the way that a presumably scientific understanding of human fertilization can be influenced by problematic conceptions of gender roles and how it brings into question a few of Lastrucci core components of his definition - namely, objectivity, phenomena, reliability, and systematic method. As it has been

discussed, the knowledge of human fertilization, which is deeply influenced by social perceptions of gender roles, is neither *objective* nor *reliable*. It also brings into question what it means to consider *phenomena* to be objective. Furthermore, the widely accepted description of human fertilization poses a question about how scientific inquiry, as a *systematic* approach, is conducted. Overall, it seems to leave us with the question: is there a problem with the systematic approach of scientific inquiry or does the problem lay in this particular conception and explanation of human fertilization?

In order to answer this question, I will examine how feminist epistemologists have engaged with, and critiqued, core tenets of traditional epistemological inquiry, like Lastrucci's.

SECTION 3: FEMINIST EMPIRICISTS AND “STRONG OBJECTIVITY”

In the previous section we were left with a question about whether the scientific method fails to produce knowledge free from bias in the particular circumstance of human fertilization or if that particular example is a symptom of a larger, systematic issue. Feminist epistemologists have taken on this question from various angles, critiquing the core tenets of the definition of scientific inquiry as presented by Lastrucci. In this section I will explore feminist epistemologists' analysis of empiricism and objectivity to shed light on this question. Part 1 of this section, I will examine arguments presented by feminist empiricists, such as Elizabeth Anderson, and how they argue that applying the scientific method with more rigor. In Part 2, I will explore Harding's argument for standpoint epistemology, the role of marginalized perspectives and what it means to consider the social relation of the

subject of knowledge as an objectivity-maximizing strategy. I will ultimately argue, with the use of Harding's term "strong objectivity," that feminist empiricists fail to fully address the systematic issues that arise from the structure and application of the traditional, western scientific method.

PART 1: ELIZABETH ANDERSON AND OTHER FEMINIST EMPIRICISTS

Many critiques of scientific inquiry explore the limitations of empirical investigation. Lastrucci engage with this issue in his book, in his chapter on the tensions between empiricism and rationalism. Lastrucci defines empiricism as "the conviction that sensory experience should be regarded as the most reliable source of knowledge" (Lastrucci 30). Lastrucci states that "empirical evidence," although not the only part of scientific inquiry "is basic to science" (Lastrucci 30). Consistent with Lastrucci's account of science, empirical investigation must observe a phenomenon that can be described objectively.

Elizabeth Anderson in "Feminist Epistemology, an Interpretation and a Defense," argues that pursuing feminist epistemology does not require a radical shift in our "internal commitments of empirical science" (52). Instead, Anderson argues that feminist epistemology is a subset of "naturalized social epistemology" such that naturalized epistemology asks science to provide "an account of its own activity," wherein we can analyze how scientific findings came about (Anderson 54). Anderson further explains:

Social epistemology is the branch of naturalized epistemology that investigates the influence of specifically social factors on knowledge production ... feminist epistemology can be regarded as the branch of social

epistemology that investigates the influence of socially constructed conceptions and norms of gender and gender-specific interests and experiences on the production of knowledge [asking how] historical exclusion of women from theoretical inquiry has affected the direction and content of research in fields ... ; how the use of gender metaphors in biology has made some phenomena more salient than others... how the feminist movement has changed our data, our ways of describing the data, and our theories about the differences between men and women. (Anderson 54)

Anderson argues that the questions posed at the end of the quote above are, at their root, empirical ones. To Anderson, questions about how the exclusion of women from theoretical inquiry have affected the direction and content of research can be answered by examining the evidence for each of these questions. For instance, in the example of distorted the knowledge claim about fertilization we would need to understand the influence that gender stereotypes and gender roles had on the representation of that knowledge empirically. This could lead us to questions like: What assumptions about gender roles did the team performing the research or writing the textbooks hold? What was involved in observing the process of fertilization? Was there a conversation about ensuring that social expectations about gender didn't get mapped onto the scientific explanation? etc. It is clear that these questions don't explicitly condemn the work that the scientific method did to "discover" the process of fertilization but rather asks explicit questions to understand what played into the knowledge claim being distorted due to socially constructed conceptions and norms about gender. Anderson argues, therefore, that "feminist criticisms and remedies can

be seen as particular, if surprising, instances of general types of criticism and remedy already acknowledged and accommodated by scientific practice” (54). Anderson asserts that there is nothing inherently wrong with the scientific method; rather, there is a flaw in the way that the investigation was conducted in this particular instance. Importantly, Anderson would agree with Lastrucci that knowledge is “out there,” and so, a more rigorous application of the scientific method would allow for more accurate knowledge claims that are not influenced by problematic cultural assumptions about gender.

Anderson argues that our typical belief-forming practices provide us with the tools to correct distorted knowledge claims as they arise. Therefore, we do not need to change our practices, only adhere to them more rigorously. In order to understand if our beliefs are true and whether we stick with them or dismiss them, we, typically, reflect on our *belief-forming* practices themselves. The process of reflecting on our belief-forming practices is the “self-reflexive endorsement test” (Anderson 55). If the belief fails the “self-reflexive endorsement test” we decide that our belief-forming wasn’t reliable and dismiss the belief. Other processes, however, satisfy the “self-reflexive endorsement test” as our beliefs “and the beliefs to which they give rise to” are verified and we decide to continue believing in them (Anderson 55). Anderson continues by stating that “a knowledge practice is rational to the extent that it promotes such critical self-reflections and responds to them by checking or canceling out the unreliable belief-formation mechanisms and enabling the reliable ones” (Anderson 55). In other words, Anderson claims that we must adapt our belief-forming practices as we find them to be unreliable. Consider, for instance, optical

illusions. When we realize that what we thought we were seeing was an optical illusion, we adjust our understanding of knowledge content such that we can separate what we think we are seeing from what we *know* is happening. Therefore, if we are able to show that our belief-forming is producing unreliable or distorted knowledge due to cultural beliefs about gender, we should cancel those belief-forming techniques and enable reliable ones.

In the example of knowledge distortion in human fertilization, Anderson would argue that we should dismiss the specific knowledge claim and, in the future, adhere more closely to a belief-forming strategy that emphasizes checking for the influence of cultural beliefs on knowledge inquiry, specifically when research topics that may involve mapping social constructs on scientific data (i.e. social conceptions of gender and human fertilization).

Anderson's view on the example of fertilization is shared by other feminist empiricists. Sharon Begley, in "The Science Wars," examines how scientific knowledge has been improved over the years, citing human fertilization as a primary example. Begley emphasizes that science has "built-in mechanisms to catch and correct the results of human foibles. After all, researchers did finally recognize that molecules in the egg actively participate in [fertilization]..." (Begley 118). Begley furthers her argument by quoting the astrophysicist Ashman, who states that despite scientists being influenced by factors they shouldn't be (such as social and cultural values), we "are still measuring something real ... and [historically] with better data the scientific method allowed us to converge on the right answer" (Begley 118). Begley concludes that we should work on being attentive to "when the research is

being skewed by social and political values, and when those biases have been recognized and neutralized by the scientific method” (Begley 118). Here, Begley argues that because we were able to figure out the truth eventually, we should apply the scientific method more vigorously such that we find accurate knowledge sooner. It is clear that Begley echoes Anderson’s argument that in order to correct for the influence of social and cultural gender stereotypes of scientific inquiry, we must adhere more rigorously to the scientific method and ask empirical questions about how social factors can affect knowledge content. Importantly, Anderson and other feminist empiricists such as Begley, engage in the type of scientific inquiry similar to the one presented by Lastrucci that values the importance of empirical investigation.

To reiterate, in order to answer the question of whether the process of scientific inquiry fails because of the way that gender influences knowledge inquiry on a systematic level or if this particular example of fertilization is an exception, feminist empiricists would stand by the scientific method, trusting empiricism and a well-performed “self-reflective endorsement test” to address and correct knowledge claims that have been distorted due to socially constructed conceptions of gender.

PART 2: STANDPOINT EPISTEMOLOGY AND “STRONG OBJECTIVITY,”

SANDRA HARDING

Contrasting to feminist empiricists, feminist epistemologist Sandra Harding argues the distorted knowledge in the description of human fertilization due to socially constructed conceptions about gender exemplifies the flaw in the scientific method, more specifically, in our application and understanding of objectivity. Harding maintains that feminist empiricists present a weak solution to a larger,

systematic issue. In “Rethinking Standpoint Epistemology: What is ‘Strong Objectivity?’” Harding criticizes empiricism as a foundation of the scientific method, arguing that we must change our understanding of objectivity such that we are as critical of the *person* involved in knowledge production (the subject of knowledge) as we are about the *content* of the knowledge (the object of knowledge) (Harding 437).

In this section, I will begin by exploring Harding’s critique of feminist empiricist arguments. I will then examine what Harding proposes instead, unpacking standpoint epistemology as an objectivity-maximizing resource as well as examining Harding’s claim for “strong objectivity.”

Harding calls feminist empiricists, such as Anderson and Begley, “spontaneous feminist empiricistsⁱⁱ” because they take the problem with distorted knowledge due to gender stereotypes/biases as one of “bad science” and due to the lack of rigor of applying the scientific method in this case, making them spontaneous (Harding 439). Harding vehemently disagrees, arguing that the distorted knowledge claim should be considered a systematic issue. Harding elaborates:

...spontaneous feminist empiricists think that insufficient care and rigor in following existing methods and norms is the cause of sexist and androcentric results of research ... Standpoint theorists think that this is only part of the problem. They [spontaneous feminist empiricists] point out that retroactively, and with the help of the insights of women's movement, one can see these sexist or androcentric practices in the disciplines. However, the methods and norms in the disciplines are too weak to permit researchers to *systematically* identify and eliminate from the results of research those social values,

interests, and agendas that are shared by the entire scientific community, or virtually all of it. (Harding 440).

To Harding, “spontaneous feminist empiricists” argue that we can point to places where science inquiry has failed and correct those knowledge claims retroactively. However, according to Harding, the issue is that the *system* of scientific inquiry itself is too weak to systematically identify how knowledge claims are influenced by problematic social conceptions of gender.

Harding pinpoints that the problem lays in objectivity not having “been ‘operationalized’ in such a way that the scientific method can detect sexist and androcentric assumptions that are “the dominant beliefs of an age”— that is, that are collectively (versus only individually) held” (440). In the fertilization example, for instance, the issue was not that one individual scientist held a problematic notion of social gender roles that distorted the content of knowledge. Rather the issue was that the dominant narrative at the time was one of a problematic social conception of gender roles such that it was not identified and, thus, created a knowledge distortion. Thus, Harding argues for a new formulation of objectivity that will engage with systematic belief systems, “strong objectivity.” In order to understand how to operationalize Harding’s “strong objectivity,” we must engage with Harding’s framework of standpoint epistemology.

Harding’s argument for “strong objectivity” is based in standpoint epistemology. Harding argues that we must critically engage with the social position of the knower and how the knower relates to the object of knowledge. Harding traces back to the origins of standpoint theory, making it clear how important it is to

understand the knower in relation to the object of knowledge. Harding states, “the intellectual history of feminist standpoint theory is conventionally traced to Hegel’s reflections on what can be known about the master/slave relationship from the standpoint of the slave’s life versus that of the master’s life...” (Harding 441).

Although Hegel’s master/slave dichotomy has many important philosophical implications, the takeaway here is the major differences one can imagine between the stories and realities of the slave as opposed to those of the master. If the slave was not given an epistemic perspective, there is valuable knowledge about the experience that is not be accessible.

If we were inquiring about the hardships of slavery, it is important to know whose account of slavery we are engaging with because they each, presumably, present different epistemic accounts of the same event. Thus, it becomes clear that there is an epistemically different point of view between the slave and the master. For instance, Thus, the relationship between the knower and the object of knowledge is important to understanding the content of the knowledge claim.

After making it clear why standpoint epistemology emphasizes the subject of knowledge in relation to the object of knowledge, Harding specifically advocates that we maximize objectivity of knowledge claims by promoting marginalized perspectives within knowledge inquiry and making information about the relationship between the knower and the content of knowledge widely accessible. In the following paragraphs, I will briefly explore her argument for marginalized perspectives and the relationship between the subject and object of knowledge.

Harding explains the relationship between dominant and marginalized perspectives epistemic position:

A social history of standpoint would focus on what happens when marginalized peoples begin to gain public voice. In societies where scientific rationality and objectivity are claimed to be highly valued by dominant groups, marginalized peoples and those who listen attentively to them will point out that from the perspective of marginal lives, the dominant accounts are less than maximally objective. Knowledge claims are always socially situated and the failure by dominant groups critically and systematically to interrogate their advantaged social situation and the effect of such advantages on their beliefs leaves their social situation as scientifically and epistemologically disadvantaged one for generating knowledge. (Harding 442)

Here, standpoint epistemology allows us to understand that every knowledge claim is socially situated such that dominant groups should reflect on the ways that their advantaged position in society intertwines with her beliefs. Here, Harding makes it clear that dominant groups are failing to engage in this type of critical inquiry and being attentive to marginalized voices will show that dominant accounts are failing to maximize objectivity.

Harding argues that in order to maximize objectivity, we need to engage in standpoint analysis and critically examine the subject of knowledge as part of the object of knowledge. Standpoint epistemologists have made the social situatedness of the subject of knowledge a “systematically accessible resource for maximizing objectivity” (Harding 458). In other words, having access to how the object of

knowledge exists in relation to the subject of knowledge is an objectivity-maximizing strategy as it provides a larger framework for the knowledge content and the validity of the content in relation to the inquirer.

Using standpoint epistemology's objectivity maximizing strategy as a starting point, Harding argues that "strong objectivity" requires that "the subject of knowledge be placed on the same critical, causal plane as the objects of knowledge" (Harding 458). Harding continues by stating that the:

subject of knowledge – the individual and the historically located social community whose unexamined beliefs its members are likely to hold 'unknowingly' so to speak – must be considered as part of the object of knowledge from the perspective of scientific method. All of the kinds of the objectivity-maximizing procedures focused on the nature and/or social relations that are the direct object of observation and reflection must also be focused on the observers and reflectors – scientists and the larger assumptions that they share." (Harding 459)

Here, Harding does not fully explain what types of objectivity-maximizing procedures that should be applied. However, Harding makes it clear that in order for any of these tests to be applied, we must have accessible information about the relationship between the subject and object of knowledge. To engage with Harding's "strong objectivity," therefore, we must apply every consideration of objectivity to the object of knowledge and the subject of knowledge such that both the object and subject of knowledge are on the same critical plane (Harding 458). Importantly, Harding makes it clear that these tests should be applied to the individual scientist as

well as to the larger scientific community to assess the collective assumptions that they share.

Recall, at the end of Section 2, after an analysis of how gender stereotypes distorted the knowledge content of the scientific explanation of human fertilization, we were left with the question about whether the issue was due to a flaw in that particular circumstance or if there is a larger, structural issue with the method of scientific knowledge inquiry. Feminist empiricists argue that we are able to avoid knowledge content distortions by applying the scientific method more rigorously. It became clear, through a brief analysis of Harding's position towards feminist empiricists, that Harding argues for a systematic solution to distorted knowledge content. According to Harding, the issue lays in how objectivity is operationalized. Harding employs standpoint epistemology to explain why the social situatedness of the subject of knowledge is important. Recall, Harding argues that in order to *systematically* identify and engage with the ways cultural belief systems influence our knowledge, we need to incorporate an understanding of the subject of knowledge in relation to the object of knowledge and make that information accessible as a part of the knowledge claim. Arguing that it is epistemically meaningful to engage with how the social position of an epistemic agent can influence the content of knowledge, Harding argues that in order to maximize objectivity, the relationship between the subject and object of knowledge (what Harding coins "strong objectivity") should be systematically accessible as a part of inquiry.

Harding, in her analysis of maximizing objectivity through standpoint epistemology, asks how to *systematically* identify how social conceptions influence

knowledge. Feminist empiricists fail to systematically engage, instead they act retroactively, affirming that we now have insight into the ways that scientific inquiry could have been done differently in specific cases (i.e. the fertilization example). Thus, Harding provides an argument for how to move into a knowledge inquiry that can identify the negative impact of widespread cultural biases on knowledge content as it happens. Thus, in the following section I will examine what it means engage in knowledge inquiry through “strong objectivity” as well as delve into what it means to promote marginalized perspectives within inquiry.

SECTION 4: KNOWLEDGE INQUIRY THROUGH “STRONG OBJECTIVITY” AND DIVERSITY AS A SOLUTION

So far, I have explored a traditional, western framework of the scientific method as presented by Lastrucci. I then discussed a description of human fertilization that is distorted due to gender stereotypes. We were left wondering whether there is a flaw in the scientific method in general or if it was due to particular errors in this investigation and/or theorizing. Feminist empiricists, such as Elizabeth Anderson, advocate for applying the scientific method with more rigor, while standpoint epistemologists, Sandra Harding, argues for a systematic shift in how we understand the knower in relation to the object of knowledge. Anderson, and other feminist empiricists, argue that we will be able to “solve for” social and cultural biases within scientific inquiry over time while Harding argues that we need to make more fundamental changes in order to avoid knowledge distortions in the first place. In Section 3, I briefly presented Harding’s argument to maximize objectivity by having the social and historical situatedness of the subject of knowledge widely

accessible. Furthermore, I explored “strong objectivity” which requires that we apply the same objectivity maximizing procedures to the subject as well as the object of knowledge. In this section, I will explore what it means to engage in “strong objectivity” and what it means, epistemically, to promote marginalized perspectives.

Recall, Harding’s “strong objectivity” focuses on examining the subject of knowledge just as critically as the object of knowledge: “strong objectivity requires that the subject of knowledge be placed on the same critical, causal plane as the objects of knowledge” (458). Harding elaborates on what this critical plane may look like in practice and why there is a need to engage with the subject of knowledge more critically:

Strong objectivity requires what we can think of as ‘strong reflexivity’ ... because culture-wide (or near culture wide) beliefs function as evidence at every stage in scientific inquiry: in the selection of problems, the formation of hypotheses, the design of research ... the way results of research are reported, etc. The subject of knowledge—the individual and the historically located social community whose unexamined beliefs its members are likely to hold ‘unknowingly,’ so to speak —must be considered as part of knowledge from the perspective of scientific method. (Harding 458)

The framework of standpoint epistemology explored in the previous section sheds light on why Harding’s “strong reflexivity” demands that the subject of knowledge be critically examined in relation to the object of knowledge. Here, Harding makes it clear that we must critically examine the subject in relation to the object of knowledge not only because the individual standpoint of the inquirer but also because

of the collective beliefs the scientific community can ‘unknowingly’ hold. However, it seems that the problem then lays in that the assumptions (and, thus, possible problematic conceptions) are held unknowingly and are difficult to be critically examined. Thus, we must incorporate “strong reflectivity” within the scientific method such that we are able to better understand how the social and historical situatedness effects the underlying beliefs that may contribute to distorted knowledge inquiry.

In order to examine these cultural beliefs that go unexamined, we need to engage with perspectives outside of the dominant narrative. Therefore, Harding argues, we should promote perspectives of marginalized individuals and communities. Harding states that:

...a maximally critical study of scientists and their communities can be done only from the perspective of those whose lives have been marginalized by such communities. Thus strong objectivity requires that scientists and their communities be integrated into democracy advancing projects for scientific and epistemological reasons as well as moral and political ones. (Harding 459)

Here, Harding argues that in order to critically assess the ways that subjects of knowledge are inadvertently perpetuating problematic notions of gender, race, ability, age, etc., and, consequently, distorting knowledge content, we must engage with knowledge inquiry *from* the perspectives of marginalized people. This type of analysis will allow for an understanding of the ways that the subject of knowledge (scientist, inquirer, etc.) is involved in a cultural framework that perpetuates systems

of inequality based, often, on false beliefs about certain communities which can, then, produce knowledge that is distorted.

Using standpoint theory, Harding gives a few suggestions of how to engage in inquiry *from* the perspective of marginalized people:

...learning to listen attentively to marginalized people; it requires educating oneself about their histories, achievements, preferred social relations, hopes for the future it requires putting one's body on the line for 'their' causes until they feel like 'our' causes; it requires critical examination of the dominant institutional beliefs and practices that systematically disadvantage them ... and more. (Harding 458)

Thus, Harding advocates for the active inclusion of marginalized perspectives within formal scientific inquiry as a way to change our knowledge structures such that we are able to examine the underlying assumptions/beliefs. "Strong objectivity" therefore, involves considering the subject and its relationship to the object of knowledge and, to do so, we must examine knowledge *from* the perspectives of marginalized identities. Importantly, Harding does not require that people of marginalized identities perform all inquiry, but rather that the entire knowledge community promote the perspectives of marginalized identities as epistemically advantageous because it allows us to understand where there are undelaying beliefs of the dominant narrative that go unexamined.

Harding, in her essay "Whose Science, Whose Knowledge," provides a more comprehensive discussion of the importance of promoting inquiry *from* the

perspectives of marginalized communities and how to go about pursuing inquiry in this way:

Criticisms of the dominant thought of the West from both inside and outside the West argue that its partiality and distortions are the consequence in large part of starting that thought only from the lives of dominant groups ... Less partiality and less distortion result when thought starts from peasant life, not just aristocratic life; from slaves' lives, not just slaveowners' lives; from the lives of factory workers, not just of their bosses and managers ... This directive leaves open to be determined within each discipline or research area what a researcher must do to start thought from women's lives or the lives of people in other marginalized groups, and it will be easier—though still difficult—to provide reasonable responses to such a request in history or sociology than in physics or chemistry. But the difficulty of providing an analysis in physics or chemistry does not signify that the question is an absurd one for knowledge-seeking in general, or that there are no reasonable answers for those sciences, too. (Harding 161-62)

Here, Harding makes two main points. The first, is that taking knowledge claims from the perspectives of marginalized people is epistemically advantageous and will produce less distorted knowledge claims. The second, is that we must engage with this premise in every aspect of knowledge inquiry, in any discipline. Therefore, it is clear that engaging with inquiry from the perspectives of marginalized identities is a crucial component to knowledge inquiry that is systematically equipped to prevent knowledge distortions due to widespread, dominant cultural beliefs.

In this section I examined Sandra Harding's "strong objectivity" as a way to reimagine objectivity such that we examine the subject and object of knowledge in relation to one another. Harding uses a term she calls "strong reflexivity" as a mechanism to reflect on the relationship between the subject and object of knowledge. According to Harding, in order to engage with a subject's social and historical situatedness, in a way that we are able to engage with unexamined, dominant cultural beliefs, we must perform knowledge inquiry *from* the perspectives of marginalized identities as it is epistemically advantageous. Therefore, by engaging in epistemic inquiry from marginalized perspectives we can better understand how widespread, problematic cultural biases and assumptions can affect the content of knowledge.

So far, I have provided two main components of engaging in a new type of inquiry that better assesses knowledge claims for distortions due to widespread, problematic cultural biases. The first, is that we should engage in inquiry that allows for the subject of knowledge to be critically assessed in relation to the object of knowledge. The second, is that we must actively engage in inquiry *from* the perspectives of marginalized communities. The last piece that is missing in this new framework of knowledge inquiry that is paramount to undergoing inquiry that is less distorted, is understanding how we can make active decisions, based on our value system, to prevent knowledge systems from being distorted due to problematic, cultural beliefs. values affect inquiry (even formal, scientific inquiry). In the following section, I will take up this last point.

SECTION 5: VALUES WITHIN SCIENTIFIC INQUIRY

In order to pursue the new framework of knowledge inquiry that I propose, we must have a more robust understanding of the role values play within the landscape of knowledge inquiry. Recall, so far I have established that there are two main components to engaging in knowledge inquiry that produce less distorted knowledge inquiry, we must critically examine the knower in relation to what they know, 2) make efforts to diversify inquirers within knowledge inquiry. In this section I will argue that because our values are embedded in the decisions that we make, we can actively make decisions that promote values insofar as those values are explicitly made clear as a part of inquiry. Specifically promoting feminist values will allow for us to constantly engage with dominant narrative paradigms to dismantle systems of oppression and establish undistorted knowledge inquiry.

In this section, I will first lay out Lastrucci's argument for value-free science. I will then object to his notion of value-free science, exploring Anderson's, Harding's, Douglas's, and Longino's arguments on the role values play in science. Each of these feminist epistemologists' builds on the previous arguments and aids in our understanding of why we can make active decisions based on our values. Anderson asserts that values cannot and should not be separated from science. Harding claims, focusing on the external components of inquiry such as hypothesis formation, that we must accept that values are a part of inquiry. Douglas' builds on Harding's argument, emphasizing the role values play in internal components of formal scientific inquiry, such as data collection and deductive reasoning. Heather Longino goes one step further and argues that if we acknowledge that both internal and external components of science are value-laden, then we can make active

decisions about which values to promote within our own inquiry. I will argue that one of the major components of knowledge inquiry free from distortions due to widespread, cultural assumptions, is to acknowledge that the role values play within inquiry and make active decisions to promote feminist values.

First off, I will examine Lastrucci's take on values within inquiry, as an exemplary case of western, traditional frameworks of knowledge inquiry. In Lastrucci's discussion on the scientific method, he considers the role values play within research and how values can, inadvertently, influence the outcomes of research. Lastrucci says that a scientist can be "influenced by cultural values ... in his choice of problems' for research, and of course in the impetus which led him to become a seeker of knowledge in the first place" (Lastrucci 7). Lastrucci states, that in this "sense of the term 'value,' it is undoubtedly true that every person, including the scientist, is a product of his time and culture, and therefore cannot escape the influences of its value system" (9). Lastrucci is confident, however, that scientists are trained to assess their data "with as little bias as possible" and the scientific community, as a whole, constantly strives to maximize objectivity (Lastrucci 7). Here, Lastrucci is arguing that although cultural values may influence scientists' decision-making processes, there are objectivity-maximizing tools in place (i.e. the scientific method and experts trained to eliminate bias). Thus, according to views like Lastrucci's, it is clear that we should strive to engage with knowledge inquiry that is as value-free as possible.

In direct response to positions such as Lastrucci's that claim value-free science, feminist epistemologists assert that we need to engage with the question of

values as part of scientific inquiry, as they are integral to the research process. As I have mentioned, I will specifically explore Elizabeth Anderson's, Sandra Harding's, Heather Douglas's, and Helen Longino's arguments.

Anderson brings to light how acknowledging embedded values within scientific inquiry is important because it can bring out inconsistent assumptions that may be distorting knowledge claims. Anderson cites Longino, who argues that, "the logical gap between theory and observation ensures that one cannot in principle rule out the possibility that value judgments are implicit in the background assumptions used to argue that a given observation constitutes evidence for a given hypothesis (Longino 199)" (Anderson 78). Here, it is clear, to that Anderson values to influence background assumptions within inquiry. Anderson makes it clear that we must acknowledge that these values play a role within inquiry such that our background assumptions can be made more apparent. Therefore, Anderson's argument for applying the scientific method more rigorously to correct for biases also asks that we acknowledge the role cultural values and beliefs play in knowledge inquiry such that we can check for inconsistencies of assumptions. For instance, in the fertilization example, in the hypothesis formation of the egg as passive, the background assumptions about a passive female could be made apparent such that it is clear it is influencing knowledge inquiry. Therefore, because we value accurate knowledge inquiry and inquiry free of the influence of problematic cultural beliefs, we would need to correct the hypothesis and reexamine the data.

Harding goes on step further than Anderson, arguing that not only can we acknowledge the role values play within inquiry, we can also allow that there are certain values that create for less distorted knowledge claims. Harding writes,

...objectivists [like Lastrucci] claim that objectivity requires the elimination of all social values and interests from the research process and the results of research. It is clear, however, that not all social values and interests have the same bad effects upon the results of research. Democracy advancing values have systematically generated less partial and distorted beliefs than others.

(Harding 460)

To Harding, those who adhere to a definition of science like Lastrucci's, which supports value-free science, fail to understand that values can be beneficial within inquiry and allow for less distorted knowledge claims. Thus, in order to understand how knowledge claims can be influenced by our values (whether positively or negatively), we must engage in Harding's "strong objectivity" and perform a critical examination of how the subject of knowledge is historically and socially situated in relation to the object of knowledge. Furthermore, according to Harding, in order to perform knowledge inquiry that isn't distorted by dominant, cultural beliefs, we can promote values such as democracy-advancing ones that will systematically produce less-distorted knowledge. It seems that feminist values may be considered one of these values as well.

Heather Douglas in "Rejecting the Ideal of Value-Free Science," builds on Harding's argument and adds another important step to recognizing the role that values play in inquiry. Douglas argues that we must acknowledge the role of values in

every component of knowledge inquiry, including internal components. Douglas asserts that:

...it has been widely acknowledged that science requires the use of nonepistemic values in the “external” parts of science, that is, the choice of projects, limitations of methodology (particularly with respect to the use of human subjects), and the application of science-related technologies. So the term value-free science really refers to the norm of epistemic values only in the internal stages of science... the belief persists that if we accept the presence of values (particularly nonepistemic values) in the inner working of science, we will destroy science and set ourselves adrift on the restless seas of relativism. (Douglas 121)

Douglas’ argument here is important to situate in relation to Anderson and Hardin’s argument. It is clear that all three of them acknowledge, although in different ways, the reliance on non-epistemic values for external aspects of inquiry. Douglas, however, posits that it is important to acknowledge that values are also present within internal components of science, reasoning and observation. Douglas states that “rejecting the value-free ideal [of internal components of science] would be good for science by allowing for more open discussion of the factors that enter into scientific judgments and the experimental process” (Douglas 121). Here, Douglas argues that in order to engage in the ways that knowledge inquiry has been influenced and possibly distorted by cultural values, we must examine the role values play in every aspect of inquiry. Interestingly, this pushes arguments from Anderson and Harding, one step

further demanding that we acknowledge that values are embedded in *every* aspect of inquiry.

Helen Longino, in “Can There be a Feminist Science?” takes the acknowledgement of values playing a role in every aspect of scientific inquiry, including internal components, another step further. Longino begins by acknowledging, like Douglas, that internal components such as observation and reasoning are heavily influenced by cultural values (Longino 54). Longino explains that traditional frameworks of scientific inquiry claim that “good science” is protected from values by the scientific methodology whereas “bad science” allows for the influence of values (Longino 53). Responding directly to those who argue, that value-laden science is considered ‘bad science,’ Longino posits that “If ... there is no a priori way to eliminate [value-laden] assumptions from evidential reasoning generally, and, hence, no way to rule out value-laden assumptions, then there there is no formal basis for arguing that an inference mediated by contextual [cultural] values is thereby bad science” (Longino 55). In other words, there is no way to eliminate value-laden assumptions from internal components of inquiry and allow for value assumptions to be a part of external components of inquiry.

Longino further explains that, within inquiry, scientists are making active choices about what to study, how to collect their data, the hypothesis they form, etc. (Longino 53). Longino argues that scientists (or the subject of knowledge within inquiry), must be attentive to how they acknowledge values within inquiry. Longino argues that statements like “it was observed” obscure the role of the scientist from any participation or influence. However, if we reject the view of value-free science

then we must also reject our role as a *passive* onlooker (56). Longino concludes that if we recognize that science is not value-free and that our feminist, political interests can promote science free of gender biases; then, instead of waiting to let the data show the scientist what to do (which may promote androcentric and sexist knowledge), scientists should acknowledge their ability to affect inquiry and make decisions that are consistent with the values and commitments of feminism. Scientists can choose to whom, socially and politically, they are accountable to (61).

Longino's argument not only allows for feminist scientists to push for political equality and promote less biased knowledge production, but that they should. These scientists make decisions on what they research, their hypothesis, populations studied, etc. and by recognizing that each decision has value imbedded in it, allows for feminist scientists to make choices informed by values they find important. It is clear, therefore, that Longino takes the acknowledgement of values in all components of knowledge inquiry one step further, arguing that because we are able to understand how our decisions are influenced by values we can make an active decision to choose what these values are.

I engaged with Anderson, Harding, Douglas, and Longino to effectively explore the ways that acknowledging that values are present in inquiry, both in internal and external components of inquiry. This leads to a conclusion that we are able to make active decisions based on our values. It is not only important but also requires us, as inquirers, to make decisions based on our value systems. Anderson argues that we always incorporate values as we make decisions, specifically in how we understand theory in relation to observation. Harding builds on this arguing that

eliminating all values from inquiry is not feasible as there are values embedded in inquiry that promote less distorted knowledge claims. Douglas takes Harding and Anderson's assertions about values within inquiry and makes it clear that we must understand that every aspect of scientific inquiry is value-laden, including the internal components of science. Helen Longino builds on Douglas' argument and posits that if we take internal and external components of inquiry as value-laden, then we should be able to choose the values that we want to promote within inquiry and who we choose to hold ourselves accountable to. Therefore, Longino argues that we can, and should, make decisions based in feminist values.

For the purpose of creating knowledge inquiry free from distortions, it is important to engage in inquiry to promote feminist values. Feminist values will promote dismantling systems of oppression and marginalized perspectives such that we are able to systematically identify the underlying dominant assumptions.

So far, I have explored a traditional western framework of scientific inquiry as presented by Lastrucci and engaged with what happens to that framework after we understand that knowledge can be distorted by problematic cultural assumptions about gender. In order to engage with scientific inquiry in a more holistic capacity that strives to correct for these distortions I have posited three main strategies 1) engage in critical examination and objectivity-maximizing tests of subject of knowledge in relation to the object of knowledge 2) diversify the inquirers involved and perform knowledge inquiry *from* marginalized perspectives and 3) acknowledge the role that values play in knowledge production, critically examine the different

values at play and allow that these can be active decisions made based on values, specifically promoting feminist values.

SECTION 6: HAACK'S OBJECTION

In this section I will explore an objection to the scientific knowledge inquiry that that I have advocated for which 1) examines the subject in relation to the object of knowledge, 2) performs inquiry *from* marginalized perspectives and 3) acknowledges and critically engages with the presence of values in science, promoting feminist values. Susan Haack's objection presents an argument that has been reiterated across time, arguing that my account, and others like it that call for a shift in what we take the main tenants of scientific inquiry, only create further issues issues within inquiry.

Haack, in "Epistemological Reflections of an Old Feminist," posits that feminist epistemologists have taken their arguments too far when they claim that we need to shift fundamental components of scientific inquiry. Haack establishes that there are only two routes by which feminism and epistemology could be connected. The two routes correspond to two interpretations of the phrase "the woman's point of view": as "the way women see things," or as "serving the interests of women" (Haack 32).

Haack does not take a women's perspective, or the perspective of any marginalized identity, to be epistemically different. Haack explores what it would mean to interpret feminist epistemology as exploring a particular way for "women to see things" assessing this as women having a particular "way of knowing" (Haack 32). Haack dismisses the possibility that women have a particular method of knowing

because each individual has differences “in cognitive style, like differences in handwriting, [which] seem more individual than gender-determined” (Haack 33). Furthermore, Haack objects to the claim that “oppressed, disadvantaged, and marginalized people are epistemically privileged in virtue of their oppression and disadvantage” (33). Haack argues that if this were true then “it would suggest that the *most* epistemically privileged are not the affluent, well-educated, white, Western women ... but [rather] the most oppressed, the most disadvantaged--some of whom are men” (Haack 33). Here, it is clear that Haack fails to understand that knowledge inquiry which I have proposed does not refer to a feminism that centers women but rather to movement committed to ending all systems of oppression.

Haack continues her discussion by questioning what whether there is an epistemic advantage to being at the margins of inquiry. Haack states that “Thomas Kuhn observed that revolutionary scientific innovations are often made by persons who are at the margin of a discipline; but women, as a class, are not "marginal" in this sense” (Haack 33). According to Haack, although there may be particular moments where important insights come from the margins of a discipline, it does not follow that women are at the margin of a discipline in the same way. However, it seems that Haack is, again, missing the point. Although women may not be at the margins of a discipline in the same way that Thomas Kuhn’s account of scientists during the scientific revolution, women have been historically pushed out of knowledge inquiry. Karen Messing, in “Women’s Occupational Health and Androcentric Science,” provides us with an example of what it means to ignore women within inquiry. In her article, Messing discusses compensated occupational illness in Québec (Messing 11).

Messing found that women had been historically and systematically excluded from research on occupational health for a number of unfounded reasons. Messing asserts that “the elimination of women from studies of occupational cancer reinforces the notion that women’s jobs are safe and that women’s concerns are unfounded” (Messing 11). Contrary to Haack’s assertion, including women in scientific inquiry both as scientists and subjects can have a major effect on how knowledge inquiry is conducted and, consequently, what is the knowledge content produced. As exemplified through Messing’s case study, the margins offer an epistemically advantageous outlook to establish where knowledge claims can be unfounded or distorted as well as offer new perspectives because there is less pressure to conform or fit the dominant paradigms.

Haack argues that “one of the ways in which oppressed people are oppressed is, surely, that their oppressors control the information that reaches them. This argues, if anything, an epistemic disadvantage for ‘oppressed, disadvantaged, marginalized’ people” (33). Here, Haack claims that because people in positions of power are able to withhold information from individuals and communities at the margins of society, it is clear that those who exist at the margins are at an epistemic disadvantage. Haack fails to understand that the questions/content of knowledge is shaped by the social position of the individual (as it has been explored). In other words, it’s not the actual information that they have accessible to them but rather the ways that they go about engaging in inquiry in the first place. For instance, in the example provided by Messing, the knowledge content remains incorrect so long as we continue to ignore and exclude women from the research. Furthermore, Haack fails to understand the

ways in which the inquiry framework I have proposed does not require that marginalized people perform inquiry but rather promotes inquiry from marginalized perspectives. The reason that these perspectives should be centered in our knowledge inquiry is due to that particular social position, there is an opportunity to understand how knowledge systematically fails to include or represent issues, thoughts, questions, etc. as the privileged positions in society is the standard narrative. It is not the marginalized individual that is responsible for working towards a more comprehensive knowledge inquiry, but rather that a shift to beginning all knowledge inquiry *from* the perspectives of marginalized identities. Therefore, Haack fails to engage with the possibility that the social positionality of an individual can inform their knowledge. Moreover, Haack fails to realize that the perspective of marginalized identities provides an epistemic advantage as it lays outside the dominant paradigm.

Recall, to Haack, the second interpretation of “the woman’s point of view” is “serving the interests of women.” The exclusion of the interests of women suggests that sexism in scientific theorizing is the result of the exclusion of female “ways of knowing” within knowledge inquiry (33). Haack grants that women are a bit more likely to notice sexism than men and that some theories in social sciences and biology may have been accepted as scientists involved could have taken stereotypical ideas of gender norms as fact (Haack 34). Haack argues that realizing that specific theories can be influenced by gender stereotypes should not lead us to include political motivations within inquiry and reasoning. Therefore, if we grant that the example of fertilization is distorted due to social conceptions of gender, we would not then be warranted to agree with my proposed framework that we can actively make decisions

about the values that we wish to promote. Rather, Haack argues, we must critically examine those specific theories and apply our standards of evidence more strictly. Haack posits that there is currently a tendency to see these instances of gender bias in knowledge and make radical changes to how we perform knowledge inquiry - these theorists, Haack argues, are “new cynics.” Haack states that the shift to this cynicism of science “sees science as a value-permeated social institution, stresses the importance of politics, prejudice and propaganda rather than the weight of the evidence” (Haack 34). It is clear, here, that Haack fails to understand *systematic* issue of distorted knowledge claims due to widespread cultural beliefs. Recall, from Section 2 the example of the distorted knowledge claim of human fertilization due to socially constructed conceptions about gender. As I have demonstrated, the widespread influence of cultural beliefs on knowledge claims calls for a systematic shift in the way we understand objectivity, from which perspectives we engage in inquiry and the role values play in our decision-making.

Haack objects specifically to two important lines of argument used by feminist epistemologists – underdetermination and value-ladenness. I will focus on Haack’s objection to value-ladenness as it directly responds to the last point in my proposed framework for knowledge inquiry about actively making decisions based on the feminist values we wish to promote. Haack summarizes feminist epistemologists’ argument about the presence of values within science, stating that feminist epistemologists claim that “it is impossible entirely to exclude “contextual” (i.e., external, social, and political) values from science” (Haack 35). According to Haack, this argument is a non sequitur. Haack claims that even if it is true “that scientists are

never entirely without prejudice” and “it is impossible that they should entirely put their prejudices out of sight when judging the evidence for a theory; it doesn't follow that it is proper to allow prejudice to determine theory choice” (Haack 36). Here, Haack establishes that we shouldn't change how we engage with knowledge inquiry after we recognize the *potential* for its distortions due to social and cultural influences. Instead, Haack concludes that “even if it is not possible to make science perfect, it doesn't follow that we shouldn't try to make it better” (Haack 36). It is clear that Haack understands the argument for value-laden science on the surface; however, she, again, fails to recognize the systematic nature of the role values play within inquiry. Values are embedded in every component of inquiry. Thus, it is not clear that inquiry should make any attempt to distance itself from values if such an endeavor is not possible. Therefore, although Haack presents an interesting nuance to the argument, her objection fails to hold much ground.

Haack grants that there are aspects of feminist epistemologists' critiques of scientific inquiry that are important to take into consideration. For instance, it is true that sometimes evidence is only considered relevant when there are persuasive factors such as the possibility of success or compensation. However, Haack argues that acknowledging that evidence-based inquiry can have distortions does not lead to the radical conclusions such as the ones that I have proposed. Haack concludes that “the epistemological significance of feminist criticisms of sexism in scientific theorizing, though real enough, is undramatic and by no means revolutionary” (Haack 37). Haack's objection to my proposed framework of knowledge inquiry severely misunderstands the systematic implications of gender bias distortions of knowledge.

Furthermore, Haack misunderstands the premise of mine, and other feminist epistemologists' argument. By beginning her argument against feminist epistemologists with an understanding of feminism as "from a woman's point of view," Haack narrows the argument to a particular rhetoric that can only have two interpretations. Importantly, feminist epistemologists do not advocate solely for the inclusion of women but rather engage with the historical marginalization of women as a systematic issue that should be addressed systematically and all developed solution should strive to end all oppression, not just sexism. Thus, Haack claims that feminist epistemologists do not make any revolutionary arguments her holds little ground because she does not take into consideration the larger, systematic concerns about knowledge distortions due to socially constructed conceptions of gender.

In this section, I explored Haack's objection to knowledge inquiry I have proposes which strategies 1) engages in critical examination and objectivity-maximizing tests of subject of knowledge in relation to the object of knowledge 2) promotes the diversity of inquirers involved and perform knowledge inquiry *from* marginalized perspectives and 3) acknowledges the role that values play in knowledge production, specifically advocating for promoting feminist values. Haack argues that women do not have a particular way of knowing since understanding and acquiring knowledge cannot be correlated with gender. Furthermore, Haack argues that acknowledging that there are values present within scientific inquiry does not mean that we shouldn't try to pursue value-free science. Haack's argument that knowledge is not inherently connected to gender is reasonable. However, Haack fails to consider the ways in which understanding perspectives of women who have been

systematically marginalized in inquiry can point towards places where knowledge inquiry is failing and knowledge is distorted due to problematic biases. Haack's argument for value-free science fails to holistically take on the role values play within inquiry, internally and externally. Haack asserts that we must apply the scientific method with more rigor and stop being so cynical about scientific inquiry. However, it is clear that fails to fully engage with the systematic implications of distortions of knowledge claims due to socially constructed conceptions about gender.

Haack's objection, therefore, holds little ground against the new framework that I have developed. The one change that Haack's objection demands is an explicit consideration of how the components are systematic concerns. Therefore, I am left with the following components that are necessary for inquiry that is less distorted due to problematic cultural assumptions about gender: 1) we must critically and systematically examine the subject of knowledge in relation to the object of knowledge, 2) make efforts to diversify inquirers as the perspectives of marginalized identities are important to informing where dominant narratives are failing to be objective and 3) actively acknowledge the role that values play in inquiry and promote feminist values.

SECTION 7: CONCLUSION

I began by examining a definition of traditional, western scientific inquiry as presented by Lastrucci such that science is to be objective, logical, and systematic. I then presented the example of human fertilization, discussed by Spanier, as a knowledge claim that had been distorted by problematic cultural beliefs and assumptions about gender. An in-depth analysis of Spanier's discussion, provides us

with an understanding of the way that problematic gender roles influence how we understand, teach and, consequently, *know* the process of human fertilization. We were then left wondering if the example of human fertilization should be considered an error in this particular example or if it indicates that we should make a changes to the systematic approach to scientific inquiry. In order to engage this question, I turned to feminist epistemologists Elizabeth Anderson, Sandra Harding, and others. It became clear that feminist empiricists ask evidence-based questions about the particular circumstances of knowledge inquiry in the fertilization example and propose that the scientists adhere more rigorously to the scientific method. Standpoint epistemology advocates for maximizing objectivity by making information about the relationship between the subject and object of knowledge widely accessible. Sandra Harding's framework, based in standpoint epistemology, established that we must engage with a new type of objectivity, "strong objectivity," such that we can reflect on the influence the social position of the subject (the knower) could have on the the object (the content) of knowledge. In order to systematically engage with how dominant narratives, fail to maximize objectivity, we must perform inquiry from marginalized perspectives. Importantly, the argument does not require that marginalized individuals conduct knowledge inquiry but rather that there is a continuous effort made to engage in knowledge inquiry *from* those perspectives. Furthermore, through an exploration of Anderson, Harding, Douglas and Longino, it is clear that we must acknowledge and critically examine the role values play in knowledge inquiry. Values are deeply embedded in both internal and external components of inquiry. If we acknowledge the role that values play within scientific

inquiry, then we should, and can, make decisions to promote values endorse – namely, feminist values. Thus, I propose three main components to knowledge inquiry that minimizes distortions due to problematic cultural beliefs about gender: 1) critically and systematically examine the subject of knowledge in relation to the object of knowledge, 2) make efforts to diversify inquirers as the perspectives of marginalized identities are important to informing where dominant narratives are failing to be objective and 3) actively acknowledge the role that values play in inquiry and promote feminist values. When exploring an objection presented by Haack to this proposed inquiry, it became clear the the emphasis needs to be on the systematic implications of distorted knowledge inquiry and consequent solutions.

Importantly, although this discussion began with an exploration of scientific inquiry it does not end there. I first sought to engage with scientific inquiry because it claims to be the “most objective” type of knowledge inquiry and so, should be best equipped to eliminate distortions caused by gender (and other) biases. However, through my exploration, it is clear that the scientific method, as it stands, is far from being free of knowledge distortions. Therefore, the three mechanisms that I have laid out are helpful such that we can apply them to individual interactions we have with knowers, everyday. I have shown that it is possible and, in fact, likely, that your beliefs are distorted by problematic biases that you may hold. Therefore, in order to have more accurate beliefs, we should be actively engaging each of the mechanisms (always look at the object of knowledge in relation the subject, advocating to engage in inquiry from marginalized perspectives and acknowledge the values we hold, such that you can make decisions based on the values you hold). Whether that be in an

interaction with a classmate, a friend, in your own reflexive practices, or in any epistemic interaction, taking the time to consider the way in which your knowledge inquiry is can be distorted due to widespread, cultural beliefs is paramount. Engaging in the three component of inquiry that I have proposed, will allow for your epistemic interactions to critically examine how your knowledge may be shaped by problematic cultural beliefs that you may not even know that you hold.

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Notes

ⁱ Emily Martin discusses it in her book *The Woman in the Body* (Martin, Emily. *The Woman in the Body: A Cultural Analysis of Reproduction*. 2001 ed., Beacon Press, 2001) and feminist philosophy of science writes directly to scientists on ways to engage with gender in science (Richardson, Sarah S. "Feminist Philosophy of Science: History, Contributions, and Challenges." *Synthese*, vol. 177, no. 3, 2010, pp. 337–362. *JSTOR*, www.jstor.org/stable/40985708).

ⁱⁱ To Harding, there is a difference between "the original "spontaneous" feminist empiricism and a recent philosophical version." Harding explains that "originally, feminist empiricism arose as the "spontaneous consciousness" of feminist researchers in biology and the social sciences who were trying to explain what was and what wasn't different about their research process in comparison with the standard procedures in their field" (Harding 440). Spontaneous feminist empiricists point to these specific moments where knowledge inquiry may fail to correct for gender bias, considering them particulars instead of systematic issues.