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(What) is feminist logic? (What) do we want it to be?

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ABSTRACT
'Feminist logic' may sound like an impossible, incoherent, or irrelevant project, but it is none of these. We begin by delineating three categories into which projects in feminist logic might fall: philosophical logic, philosophy of logic, and pedagogy. We then defuse two distinct objections to the very idea of feminist logic: the irrelevance argument and the independence argument. Having done so, we turn to a particular kind of project in feminist philosophy of logic: Valerie Plumwood's feminist argument for a relevance logic ($\mathsf{L}_{\mathsf{Plum}}$). Plumwood's work serves as our primary case study as we turn to the project of considering three different ways that we might understand her argument and revisionist arguments like it: as *a priori* theorizing, as *ameliorative* conceptual engineering, or as instances of *anti-exceptionalist* approaches to logic. After arguing that the anti-exceptionalist approach seems to provide the most promising means of understanding the kind of project undertaken in a feminist challenge to classical logic, we briefly address the consequences that this might have for logic instruction. Here, we argue for the perhaps unexpected conclusion that feminist programs ought to offer more, not less, instruction in logic for those who take interest.

KEYWORDS
feminist logic; Valerie Plumwood; relevance logic; anti-exceptionalism; pedagogy

1. (What) Is Feminist Logic?

While there are many forms of feminism, each is committed to the abolition of sexism and the creation of a more just world. In service of these goals, feminists have undertaken a wide array of projects, from political movements securing women's suffrage to intellectual movements de-centering Western women's experience within feminist discourse. Here, however, we focus on the collection of projects known as 'feminist logic' or, a bit more carefully, feminist approaches to logic (and its philosophy), some of which are more controversial than others. In this section we identify three such projects and catalogue some (but surely not all) of the extant work that falls into each. Of course, this brief taxonomy is not meant to be exhaustive (nor are the three categories we discuss meant to be exclusive)[1]—there are no doubt innumerably many ways that one

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[1]In addition, there are historical projects that are relevant to work on feminist logic, such as identifying female logicians that have been omitted from standard histories and textbooks and assessing the impact of their work on the development of logic. Extant work along these lines includes *Uckelman forthcoming* on

might think about or work on logic from a distinctively feminist perspective. Nevertheless, this taxonomy will be useful in terms of locating the task undertaken in this paper, helping us to clarify both what it is that we are trying to do, and what issues we leave unaddressed (for the time being, at least).

First, we might undertake a project in *philosophical logic*.[2] Approaches along these lines include attempts to formalize notions that are central to positions, arguments, and disputes within feminist philosophy. For example, *Bowman & Cook forthcoming* develops a modal semantics and deductive system for the *knowing-what-it's-like-to-be-*$\Phi(x)$ operator and *Saint-Croix 2020* develops a formal epistemological framework for understanding the standpoints of standpoint epistemology. But this category also includes less formal work, such as accounts of the ways that gender and hierarchical status (and other social categories) affect real-life reasoning practices (*Burrow 2010*, *Bondy 2010*, *Russell forthcoming*$_2$). Or we might ask whether prominent 20th century views on formal logic are amenable to, supportive of, or compatible with, feminist philosophy. Notable examples of this sort of work include *Yap 2010*, *Yap forthcoming*, and *Anderson forthcoming* on Rudolf Carnap's Principle of Tolerance, *Hass 2002* on John Dewey's logic, and *Nelson & Nelson 2002* on W.V.O. Quine's holism.

Second, we might engage in debates in the *philosophy of logic*, asking questions or defending particular views regarding which logics are correct or useful (or challenging the very idea that formal logics can be correct or useful in the first place), while formulating such work from a distinctively feminist perspective. The most prominent extant work along these lines includes *Nye 1990*, which argues that formal logic is incompatible with feminist concerns altogether, and *Plumwood 1993* and *Plumwood 2002*, which suggest instead that it is *classical* logic that is the problem, a problem which can be solved by moving to relevance logic. Nye's and Plumwood's works will play prominent roles in the discussion below. But it is worth noting that there exists additional work along these lines, including *Haack 1996* and *Curthoys 1997*, who argue that, although feminist philosophy and formal logic are both legitimate, they are essentially independent of one another; *Jay 1981* and *Frye 1996*, who argue that propositional and first-order logic should be abandoned in favor of some kind of Aristotelian syllogistic logic; *Trettin 1991*, who takes an ecumenical, but nevertheless revisionary approach to the relationship between contemporary feminist theory and logic;[3] and *Olkowski 2002*, who argues for a similar avoidance of classical first-order formalisms, but suggests a version of Stoic logic as replacement.

Third, we might engage in a *pedagogical* project, re-examining our classroom practices with respect to logic instruction. Work along this line includes investigating the role that gender plays in logic instruction and learning, and in the models of argument

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Eloise d'Argenteuil and Christine de Pisan, *Gordon-Roth forthcoming* on Anna Maria van Schurman and Mary Astell, *Janssen-Lauret forthcoming* on Christine Ladd-Franklin and Constance Jones, *Beaney 2003* and *Janssen-Lauret 2017* on Susan Stebbing, and *Rentetzi 2010* on Rose Rand.

Note, too that even if one or the other of the objections to feminist logic we discuss in §2 were successful, this would not rule out this sort of historical work. This sort of work would remain important even if, as is argued in *Nye 1990*, formal logic turns out to be a failed research project, for the same reason that historical work identifying hitherto unrecognized women in the history of alchemy would constitute important work in the history of the empirical sciences, despite alchemy being soundly debunked.

[2]Here we mobilize a distinction between *philosophical logic*—the use of logical tools and techniques such as formalization and model-building to help us better understand philosophical concepts and debates—and *the philosophy of logic*—the philosophical investigation of various logical concepts, questions, and disputes. While both the distinction itself and how best to understand it have been matters of controversy, we find the distinction as we have drawn it here to usefully separate two distinct sorts of project within feminist work on logic.

[3]We leave further analysis of where Trettin's scholarship falls within the history of feminist philosophy of logic to our German-speaking colleagues.

analysis taught in logic courses (*Gilligan 1982*, *Warren 1988*, *Orr 1989*, *Gover 1993*); exploring ways to teach (classical/traditional) logic in the face of feminist criticisms of the traditional classical framework due to Nye and Plumwood (*Ayim 1995*, *Pugliese & Secco forthcoming*); and assessing the prevalence and perniciousness of the 'adversarial method' of argument evaluation in logic texts (*Moulton 1983*, *Hundleby 2010*, *Rooney 2010*, *Hundleby forthcoming*).[4]

In this essay we will be concerned for the most part with the second of these projects: the philosophy of logic. In particular, we will look at arguments for the claim that the correct logic (or logics, if we also adopt a version of logical pluralism) is some non-classical logic, where these arguments are based on distinctively feminist premises or perspectives. Our primary case study for this kind of argument will be Val Plumwood's argument for relevance logic (*Plumwood 1993*, *Plumwood 2002*), though we hope to offer a sufficiently general argument for answering our central questions, which are these: How should we understand this kind of revisionist, feminist project? What is the philosophy of logic itself that underlies this project? What is the metaphilosophical approach at hand? We shall argue that feminist challenges to classical logic as the single correct or best logic can be fruitfully understood as broadly *anti-exceptionalist*, contrasting these feminist logical projects both with traditional *a priori* approaches to the epistemology of logic and with other feminist work that characterizes itself as *ameliorative* (these distinctions will be examined in detail below). This, in turn, will suggest that feminist arguments for logical revision—that is, feminist arguments against classical logic in favor of one or another non-classical formalism—will likely turn out to be radically pluralist in nature.

Before moving on, we would like to emphasize that the kinds of arguments and positions we are concerned with here—arguments for the claim that a particular logic is correct or best from a feminist perspective—should not be understood as endorsing a position according to which the logic governing reasoning carried out by women is (or ought to be) different from the logic governing reasoning carried out by men. Rather, the arguments in question involve concluding that, viewed from a feminist perspective, or considered from a theoretical vantage point that takes feminist concerns seriously, the correct or best logic may be distinct from the logic that *appears* correct or best from perspectives that do not take such data into account. In short, feminist philosophy of logic does not dispute the claim that the correct logic applies to all reasoners equally. Rather, the claim is that feminist philosophy provides novel and heretofore un- or under-appreciated evidence regarding which logic is (or which logics are) correct or best—that is, correct or best for everyone.[5]

The remainder of this essay will proceed as follows. We will begin, in §2, by heading off two initial objections to the entire project—that is, we will defuse two distinct arguments for the claim that feminist philosophy, and feminist concerns more generally, have nothing to offer logic in general, and nothing to offer to debates regarding the identity of the correct logic (or logics) in particular. Next, in §3, we will briefly rehearse the most prominent *feminist* argument against classical logic, and for logical revision: Valerie Plumwood's feminist argument for a relevance logic ($\mathsf{L}_{\mathsf{Plum}}$).[6] Plum-

[4]A number of the articles cited in this four-part taxonomy appeared in a 2010 special issue of *Informal Logic* titled 'Reasoning for Change', edited by Phyllis Rooney and Catherine Hundleby.

[5]This is not to say that one could not consider other projects where the correct or best logic might be different for different groups. On such a view, one logic might be best for white men, another for white women, another for persons of color, etc. The point is that we are not concerned with such projects here. For an exploration of the idea that different logics might be correct relative to different epistemic communities, see *Cook Unpublished*.

[6]Here and below we will use ($\mathsf{L}_{\mathsf{Plum}}$) to denote whatever relevance logic Plumwood has in mind in *Plumwood 1993* and *Plumwood 2002*. Plumwood is far from clear regarding which of the various Australian plan logics

wood's work will serve as our primary case study as we turn to the project of section §4, wherein we will consider three different ways that we might understand her argument and revisionist arguments like it: as *a priori* theorizing, as *ameliorative* conceptual engineering, or as instances of *anti-exceptionalist* approaches to logic. After arguing that the anti-exceptionalist approach seems to provide the most promising means of understanding the kind of project undertaken in a feminist challenge to classical logic, we will briefly address the consequences that this might have for logic instruction (projects of the third variety) in the concluding §5. Here, we argue for the perhaps unexpected conclusion that feminist programs ought to offer more, not less, instruction in logic for those who take interest.

2. Two Objections to Feminist Logic

In this section we consider two arguments purporting to show that the very idea of feminist logic is misguided. As we shall see, the key to understanding the ways in which these arguments are flawed—and hence the key to making room for feminist concerns within our logical theorizing—is to be somewhat more careful than is usual with respect to what, exactly, a formal logic is meant to do. The sort of project we are interested in here is only viable if both of the objections we are about to sketch fail. Fortunately, as we shall see, they do.

2.1. *The Incompatibility Objection*

The first argument against the sorts of projects we intend to explore here, which we shall call the *Incompatibility Objection*, claims that, as a matter of philosophical principle, there just is, or can be, no such thing as feminist logic—feminist philosophy and formal logic are, on this view, incompatible with one another. In particular, on this sort of view feminist approaches to logic are misguided because logic itself is an anti-feminist, inherently patriarchal enterprise. As we noted earlier, Andrea Nye argues for exactly this sort of view in *Words of Power: A Feminist Reading of the History of Logic*. Nye develops a detailed study of the history of logic, arguing that logic has been used throughout history to further the ends of the men who studied, taught, and developed the field. As a result, logic itself is inseparable from the oppressive history from which it sprung on Nye's account (*1990*, p. 5):[7]

> ... there is no one Logic ... but only men and logics, and the substance of those logics, as of any written or spoken language, are materially and historically specific relation between men, between men and women, and between them and objects of human concern.

Further, according to Nye, there can be no 'better' feminist (or even neutral) logic that is not oppressive in this way (*1990*, p. 175):

she has in mind in these essays. But nothing really important hinges on this—either for our purposes or for Plumwood's—since the main point is that feminist considerations motivate us to embrace some non-classical logic that does not behave badly in the ways that Plumwood identifies (see our discussion in §3 below). It is clear from her discussion, however, that whatever logic is chosen, it must be significantly weaker than the frequently discussed relevance logic (R), since (R) validates excluded middle (again, see §3). For details on these various logics, the reader is encouraged to consult *Priest 2009*.

[7] We focus on *Nye 1990* since (i) Nye's critique is the most extensively developed argument for the rejection of logic, and (ii) Nye's monograph is Plumwood's main foil. But Nye is far from the only feminist writer to question the legitimacy of formal logic from a feminist perspective. For a particularly interesting case, see Marjorie Hass's reading of Luce Irigaray as rejecting formal logic in *Hass 2002*.

> If I am right about this, there can be no superior logic that will show up the mistakes of logicians; there can be no feminist logic that exposes masculine logic as sexist or authoritarian.

Put succinctly, according to Nye, logic is a practice, tool, or discipline that is *in principle* tied up with patriarchy and the oppression of women. So, feminist philosophers should not seek to develop philosophical views regarding logic, or seek to use logic to further feminist ends, but should instead abandon logic altogether.[8]

This objection to the very idea of feminist logic is not difficult to deflect, however. Even on the most charitable reading of Nye's historical analysis, the resulting criticisms that Nye aims at formal logic as a discipline confuse the (possibly pernicious) ways that logic *has* been used with the ways that logic *can* be used. In short, even if logic *has* been a tool of the master (in Audre Lorde's (*1984*) terms), we see no reason to think that the same tools cannot be used (non-perniciously) to dismantle the master's house—and we see even less reason to concede that these tools were ever the master's to begin with. On the contrary, we take the work on feminist philosophical logic, the second kind of project catalogued in §1, to provide powerful, albeit indirect, support for the claim that formal logic and feminist philosophy can both benefit from attending to their overlap. Further, formal logic is a powerful tool both for battling the faulty argumentation that supports various kinds of oppression and for formulating effective arguments of one's own to counter such oppression—a theme to which we shall return in the concluding section of this essay.

2.2. *The Independence Objection*

The second objection to feminist approaches to logical topics (or certain sorts of logical work on feminist topics), which we shall call the *Independence Objection*, involves claiming not that logic and feminist philosophy are incompatible, but rather that they are irrelevant to one another. In short, on this approach logic is a mind-and-society-independent metaphysico-semantic enterprise. If logic is mind-and-society-independent, then feminist concerns regarding concepts such as Gender and Sex (or any other distinctly feminist concerns) should have no place in theorizing about logic.[9]

We can flesh out the Independence Objection in more detail as follows. Logic is the study of the *logical consequence relation*—that is, the relation that holds between a set of premises Δ and a conclusion Φ if and only if the truth of the latter is guaranteed, of necessity, by the truth of the former, and further, where this guarantee holds in virtue of the logical form of the sentences (or statements, or propositions, etc.) involved.[10] The fact that a particular sentence Φ follows from a set of sentences Δ is a fact about the world and is independent of particular reasoners. In particular, the identity of the correct logic (or logics) depends solely on facts about the logical form and/or meaning of sentences, and facts of this sort (once settled) are independent of us and our particular social, political, or epistemic situation. Thus, whether or not Φ follows from Δ *might* depend on the domain of inquiry in question, or the language we are

[8]Interestingly, in later work Nye seems somewhat more amenable to project in philosophical logic, suggesting in *Nye 2002* that, if formulated from a suitably feminist perspective, the tools of formal logic might be useful in clarifying various debates in the philosophy of biology.

[9]Note that the Independence Objection, were it correct, would entail that feminist concerns are irrelevant to logical theorizing, but not vice versa. In short, if the independence objection is right, then feminist philosophy (like all other areas of intellectual inquiry) is still constrained by logic, but not the other way around.

[10]This understanding of logical consequence is a paraphrase of the immensely influential account given in *Tarski 1936*.

using, or on the particular notion of logical consequence that interests us, but it can't depend on who is asking, *anymore than the facts of science depend on who is asking.*[11]

In order to defuse this objection, we need to be a bit more careful regarding what, exactly, we think a formal logic is meant to codify, or, equivalently, why we are interested in the logical consequence relation. In particular, it is worth distinguishing between two broad ways that we can understand the purpose of identifying the correct, or best, logic:

Conception 1: The Metaphysical/Semantic Conception

The *primary purpose* of formal logic is to map out a special relation (logical consequence) holding of sentences (or propositions, etc.) solely in terms of the logical form (or other semantic or syntactic characteristics) of those sentences.

Conception 2: The Epistemic/Normative Conception

The *primary purpose* of formal logic is to codify a methodology for investigating the world—in particular, to codify various kinds of *obligations* and *permissions* regarding what we can or can't, should or shouldn't, accept or reject.

The Independence Objection is only compelling if we opt for the Metaphysical/Semantic Conception of logic. But it is far from clear that this is the right way to understand the purpose of logical theorizing. After all, logic is intended to provide us with information regarding how we ought to reason, but it is far from clear how logic provides us with such information if the *primary* purpose of logic is to map out a relation holding between (abstract) linguistic items (or sets of linguistic items). On the contrary, it seems clear that the primary purpose of logic is to codify various norms that guide (or should guide) our reasoning.[12]

Thus, it seems we should opt for the Epistemic/Normative Conception of logic. Importantly, this conception of logic is still compatible with our actual logical practice involving the investigation of metaphysical relations holding between sentences. Just as in many other areas of inquiry, the mobilization of mathematical tools and techniques has been a useful and fruitful tool for investigating the world and helping us to determine what norms should govern our (deductive) reasoning. This is because mapping out various metaphysical relations holding of sentences (or propositions, etc.) solely in terms of the logical form of those sentences is a useful approach to determining what sorts of obligations and permissions hold with regard to what we should accept and reject. The Epistemic/Normative Conception of logic does not require that we abandon the metaphysical methodology, but only requires that we recognize that this methodology is valuable *because* it has proven to be a useful *tool* for identifying the relevant norms.

But, once we have adopted the Epistemic/Normative Conception of logic, it becomes relatively easy to see how feminist philosophy could play a substantial role in logical theorizing in general, and in disputes about the correct, or best, logic in particular. In general, the correct, best, or better (non-logical) epistemic norms often vary from one group or situation to the next. Further, there is no 'extra-epistemic' vantage point from which we can judge one set of (successful-in-practice) norms to be objectively

[11] Of course, the reader familiar with feminist work on the philosophy of science may already be a bit worried about the comparison made in the final sentence of this argument! We will return to this thought in §4 below.

[12] And, if this weren't the primary purpose of logic, then it is unclear why—*qua* philosophers—we should *care* about logic. At the very least, it is unclear that we should—again, *qua* philosophers—care about formal logics any more than, or any differently from how, we care about other abstract structures such as the subject matter of pure mathematics.

better than another (much less identify some privileged set as 'best').[13] These are standard and (we think) now uncontroversial lessons from recent work in (e.g. social, feminist) epistemology. In particular, such variation in (non-logical) epistemic norms often depends on differences between the beliefs, situations, social roles, and perspectives of different individuals or groups. Why, on the Epistemic/Normative reading of logic, should we expect the epistemic norms provided by logic to be any different?

Thus, contrary to what is suggested by the (faulty) Incompatibility and Independence Objections, it does not seem that feminist concerns are in any way inimical to work on logic in general, or to debates regarding the correct or best logic in particular. The next obvious question, then, is to ask what such feminist contributions to such debates might look like. To answer this question, we will turn to the most prominent extant example of feminist argumentation in the philosophy of logic: Plumwood's case for abandoning classical logic (C) in favor of an (Australian plan) relevance logic ($\mathsf{L}_{\mathsf{Plum}}$).

3. Plumwood's Feminist Logical Revision

Before asking how we should understand feminist contributions to the philosophy of logic, as we will in §4, we focus on one such argument in particular. In this section we will summarize Val Plumwood's argument (*1993, 2002*) against classical logic (C) and for the relevance logic ($\mathsf{L}_{\mathsf{Plum}}$), which will serve as an examplar for our discussion in §4. We will call this argument *Plumwood's Feminist Argument for Logical Revision* (and similar arguments will be referred to as *Feminist Arguments for Logical Revision*).[14] Plumwood's argument, as well as both the small literature on this argument and other arguments for or against logical revision from a feminist perspective, have concentrated on the role that negation plays in logical theorizing—a pattern that we will continue here.

Plumwood begins by distinguishing between three different views that the feminist philosopher might have toward negation in particular (and towards logic more generally):[15]

- *Externalism*: Logical negations are not in-and-of-themselves oppressive.
- *Centrism*: Logical negations that are 'centering'—that is, negations that define one concept in terms of the absence of a second concept, where that second concept is *centered*—are (or can be) oppressive.
- *Negationism*: All logical negations—that is, all instances of defining or delineating a concept in terms of the absence of a second concept—are in-and-of-themselves oppressive.

As we already noted, externalism has been explicitly argued for in *Haack 1996* and *Curthoys 1997*. Negationism is, of course, the view of *Nye 1990*, and Marjorie Hass also interprets Luce Irigary as holding something like this view in *Hass 2002*.

Plumwood, however, develops a version of centrism regarding negation. She emphasizes the fact that we need *some* logical means to draw mere distinctions (what she calls *dichotomies*) and that, further, many such distinctions are completely harmless (*1993*, p. 446, emphasis added):

[13] We note that this need not collapse into any thoroughgoing relativism. See *Seidel 2014*.
[14] For a good survey of (Australian plan) relevance logic and related systems, see *Priest 2009*.
[15] Adapted from Plumwood (*2002*, pp. 56-60).

> The term 'dualism' is often used in ways which do not distinguish it from dichotomy. But if we mean by 'dichotomy' what is commonly meant, simply making a division or drawing a distinction, it is essential to distinguish between dualism and dichotomy. Equating them would either cripple all thought (if we were forced to abandon dichotomy along with dualism) or collapse the concept of dualism (if we were forced to retain dualism along with dichotomy). In either case escape from dualism becomes impossible. Both in terms of predicate logic and in terms of propositional logic, a dualism must be seen as a quite special kind of distinction or dichotomy, one involving particular features which result from domination. It is not just the fact that there is a dichotomy, that distinctions are made between two kinds of things which is the key element in establishing a dualistic relation—*indeed it is hard to imagine how anyone could get along without making at least some of the distinctions in the list of dualisms*—it is rather the way the distinctions have been treated, and further assumptions made about them and the relationship imposed upon the relata which make the relationships in question dualistic ones. Thus by no means every dichotomy results in a dualism.

In Plumwood's discussion, dualisms are distinguished from mere (non-pernicious) dichotomies in terms of five 'centering' characteristics: *backgrounding*, *radical exclusion* (or *hyperseparation*), *relational identity*, *instrumentalism*, and *homogenization*.[16] Plumwood argues that these characteristics arise from the patterns of thought found in 'established and developed cultural expression' of hierarchy Plumwood 1993, 447. Classical negation, she argues, imports these characteristics into *all* dichotomies, thereby fraudulently naturalizing centering as a part of logic rather than of culture.

Since our purpose is not the detailed explication of Plumwood's argument but rather setting it up as an example of a *type* of argument for (feminist) logical revision, we will not attempt to give a full explication of all five of Plumwood's crtieria here. Working through a few of these criteria will, however, be helpful for what follows. With regard to *radical exclusion*, Plumwood writes that (*1993*, p. 455, emphasis added):

> The negation of classical logic (which is responsible for its paradoxical character), has features of radical exclusion of the other which lie behind distancing and discontinuity, as well as exhibiting other features which are characteristic of dualism. *The radical exclusion aspects of classical otherness are evident in the classical treatment of contradictions as implying everything, for the effect of* $(p \,\&\, \neg p) \to q$ *is to keep* p *and its other or negation at a maximum distance, so that they can never be brought together (even in thought), on pain of the maximum penalty a logical system can provide, system collapse.*

In other words, a negation that supports the rule of inference commonly known as *ex falso quodlibet* (or *explosion*):[17]

$$\Phi(x), \neg\Phi(x) \vdash \Psi(x)$$

does not allow for any overlap between the extension of $\Phi(x)$ and the extension of $\neg\Phi(x)$. Since, according to Plumwood, such prohibitions are in conflict with feminist rejections of sharp borders between a concept and its 'other' (especially with respect to concepts of central concern to feminists such as gender concepts), we should reject logics (and the negations that come with them) that validate *ex falso quodlibet*.

[16] It is unclear if a distinction need satisfy all five, or just 'enough', of these criteria, in order to be a dualism.

[17] Plumwood formulates the logical principles that are tied to various ways of centering in terms of propositional logic. We have instead utilized first-order resources to codify the problematic rules in order to emphasize the fact that it is categorization that seems to be the primary issue here—that is, whether a logic acceptable to feminists ought to assume that everything is either $\Phi(x)$ or $\neg\Phi(x)$, or that nothing can be both $\Phi(x)$ and $\neg\Phi(x)$, etc.

Next, we look at *relational identity*. Plumwood's explication of *relational identity* is a sort of dual of *radical exclusion* (*1993*, p. 454, emphasis added):

> The negation of classical logic is a specific concept of negation which forces us to consider otherness in terms of a single universe consisting of everything. In classical logic, negation ($\neg p$), is interpreted as the universe without p, everything in the universe other than what p covers, as represented in the usual Venn diagram representing p as a figure surrounded by a square which represents the universe, with p as the difference [...] $\neg p$ *can then not be independently or positively identified, but is entirely dependent on* p *for its specification.* Not-p has no independent role, but is introduced as merely alien to the primary notion.

In short, a negation that involves understanding $\neg\Phi(x)$ as merely the residue left over after we have identified those things that satisfy $\Phi(x)$—that is, a negation that supports *excluded middle*

$$\varnothing \vdash (\forall x)(\Phi(x) \vee \neg\Phi(x))$$

does not allow for there to be 'space' between those things that satisfy $\Phi(x)$ and those things that satisfy $\neg\Phi(x)$. Since, again, such prohibitions are in conflict with feminist rejections of sharp borders between a concept and its 'other', we should reject logics (and the negations that come with them) that validate *excluded middle*.

This does not, of course, exhaust the various properties that Plumwood argues the correct logic (and its non-centering, non-dualistic negation) must have, but it is sufficient to give the reader a feel for Plumwood's approach.[18] In short, Plumwood argues that centering negations—and, in particular, classical negation—result in, or are at least prone to result in, pernicious dualisms: dualisms that are at odds with feminist theorizing and feminist philosophy. As a result, we should reject classical logic (and presumably any other logics whose negation is prone to the formulation of dualisms) in favor of one or more logics whose negation does not share this problem.

Plumwood concludes by noting that the (Australian plan) relevance logic ($\mathsf{L}_{\mathsf{Plum}}$) avoids the pitfalls in question, and thus should be adopted as the correct logic. While this is far from a full exploration of Plumwood's rich and thought-provoking feminist challenge to classical logic, it is sufficient for our purpose, which is to serve as a case study with respect to which we can ask the following question: how, exactly, should we understand feminist arguments for logical revision? In the next section we will attempt to answer this question.

Before moving on to this argument, however, it is important to note that we do not mean to be endorsing all aspects of Plumwood's account. Instead, we use Plumwood's argument as a salient *example* (and, arguably, the *only* well-developed example) of a feminist argument for logical revision. In particular, we will argue below that feminist arguments for logical revision will likely involve a novel and radical form of logical pluralism, in contrast to Plumwood's monistic defense of relevance logic (and only relevance logic) as the one true logic.

[18] For more detailed examinations of Plumwood's feminist version of logical revision, see *Eckert & Donahue 2020*, *Eckert forthcoming*, and *Burns forthcoming*.

4. (What) Do We Want it to Be? Three Approaches to Feminist Logical Revision

Now that we have briefly surveyed an example of a feminist argument for logical revision, we can ask the central question of this essay: What kind of project is feminist logical revision? There are (at least) three possible answers one might give to this question. First, we might take a feminist argument for logical revision (such as Plumwood's) to be an *a priori* argument for the proponent's favored logic (L) over classical logic (C). Second, we might understand such arguments as proposals for an *ameliorative project* whereby we should replace our current logical concepts—presumably, those involved in our current (classical?) understandings of the logical operators—with new concepts corresponding to the logical operators occurring in (L). Third, we might interpret these feminist challenges as *anti-exceptionalist* arguments for adopting (L), rather than (C), as our best scientific theory of logical consequence, where (L), and (C), are continuous with, and judged using the same criteria as, our other scientific theories. We will consider each of these options in detail in the subsequent subsections.

4.1. *The A Priori Approach*

The traditional way to understand arguments for or against a particular logic as correct or best is as *a priori* arguments. For example, in *The Problems of Philosophy*, Bertrand Russell writes, regarding the epistemology of logic, that "we see [their] truth without requiring any proof from experience," (*1912*, p. 52). Along similar lines, a late 19th century logic text titled *A Manual of Logic* describes the laws of logic as stemming from pure *a priori* reflection (*Welton 1896*, vol. I, p. 30):

> The Laws of Thought, Regulative Principles of Thought, or Postulates of Knowledge, are those fundamental, necessary, formal and *a priori* mental laws in agreement with which all valid thought must be carried on. They are *a priori*, that is, they result directly from the processes of reason exercised upon the facts of the real world.

Most work in the philosophy of logic has, until very recently (see the discussion of anti-exceptionalism below) been understood as at least loosely in line with this *a priori* picture. So, we might see feminist revisionism as yet another example of this tradition.

There are problems, however, with understanding the kind of logical revision proposed by feminist logicians such as Plumwood as being based on purely *a priori* considerations. The first problem is understanding why it was only recently that feminist challenges to logical orthodoxy appeared. What is it, exactly, that (on this picture) previous logicians missed, but more recent, feminist thinkers were able to perceive *a priori*? What, exactly, might explain the fact that, to put things a bit bluntly, there were *a priori* truths that are accessible to feminist logicians but which were either inaccessible to, or ignored by, eminent logicians such as Frege and Russell?

We do not mean to deny the possibility that the unique perspectives of female and/or feminist philosophers might provide them with *a priori* insights that were missed by earlier logicians working in what was, up until very recently, an extremely male-dominated field. This idea could, perhaps, be given further support by observing that up until recently logic, as a discipline, was not only dominated by men, but was also often dominated by what we earlier called the Metaphysical/Semantic conception of logic. For example, in the same work as was quoted earlier, Russell writes that (*1912*, p. 51, emphasis added):

> The name 'laws of thought' is also misleading, for what is important is not that we think in accordance with these laws, but the fact that *things behave in accordance with them*; in other words, the fact that when we think in accordance with them, we think truly.

While Russell's main point here is no doubt to make the familiar observation that the phrase 'Law of Thought' should not be understood psychologistically as denoting the laws that describe how we *do* think, but should instead be understood as denoting the laws describing how we *should* think (an observation strenuously emphasized by his logical hero, Gottlob Frege), it is notable that he supports this point by emphasizing that the laws of logic describe *how things in the world must behave*—that is, he assumes that logic describes something external to, and independent of, the reasoners who use that logic. With this in mind, one could perhaps spin a tale whereby:

- Feminist challenges to classical logic are only plausible if one rejects the Metaphysical/Semantic conception of logic in favor of the Epistemic/Normative conception.
- Feminist philosophy somehow focuses our attention in a way such that we can see the superiority of the Epistemic/Normative conception of logic in a manner which was unavailable without this feminist focus.

We will not attempt to construct such an account in detail, however. Even if one can tell such a story, it is not Plumwood's story. It seems to be incompatible with the actual data provided by our case study of the previous section (and incompatible with the way we imagine any other specifically feminist challenge to classical logic might go). Plumwood's argument against classical logic C, and in favor of the relevance logic ($\mathsf{L}_{\mathsf{Plum}}$) does not proceed via pure *a priori* consideration of how all concepts might behave (and thus of how first-order logic should treat the predicates that pick out such concepts).

Instead, the objections to various classical principles, such as *ex falso quodlibet* and *excluded middle*, stem from consideration of particular concepts such as Male and Female (where the latter is understood, for the purpose of the criticisms, as ¬Male), focusing on how the principles of classical logic are in conflict with the actual behavior of these concepts as *observed by* feminist scholars, or *detected from* feminist perspectives. In short, the epistemology underlying feminist arguments for logical revision such as Plumwood's defense of relevance logic just are not *a priori*, instead relying on real-world knowledge regarding the behavior of real-world concepts of central concern to feminist theorists.

4.2. *The Ameliorative Project*

The next option is to interpret Plumwood's project, and feminist critiques of classical logic more generally, as a type of ameliorative undertaking. In 'Gender and Race: (What) are they? (What) do we want them to be?', Sally Haslanger describes ameliorative projects as follows (*2000*, p. 33):[19]

> ...the task is not to explicate our ordinary concepts; nor is it to investigate the kind that we may or may not be tracking with our everyday conceptual apparatus; instead we begin by considering more fully the pragmatics of our talk employing the terms in question. What is the point of having these concepts? What cognitive or practical task

[19] *Haslanger 2000* refers to these as analytic projects; Haslanger (*2006*, ft. nt. 5) clarifies that 'ameliorative' is a mere terminological update for analytic projects. In keeping with this update (and the literature), we use the term 'ameliorative' here, despite the fact that the quoted source identifies these as analytic projects.

do they (or should they) enable us to accomplish? Are they effective tools to accomplish our (legitimate) purposes; if not, what concepts would serve these purposes better?

Ameloriative projects aim to improve our existing concepts by interrogating the purposes to which our concepts are (or ought to be) put, then updating those concepts to meet any gap revealed by that interrogation. This is possible because an ameliorative approach recognizes that concepts not only provide meaning for terms, but also serve a particular purpose within our reasoning and broader conceptual scheme. Given this, mismatches may arise between a concept and its purpose. For example, we may have a vague or muddled sense of this purpose prior to interrogating it, or the use of a concept may have shifted over time, without a corresponding shift in conceptual resources. Much of feminist work on the concept of GENDER fits within this mold: Prior to focused interrogation of GENDER—interrogation that reveals a contrast with SEX and illuminates deeply social functions apart from sex, such as coordinating norms of behavior, dress, and speech, reinforcing patriarchal norms, and ingraining heteronormative assumptions—the concept picked out (often simply SEX) poorly served the purposes to which the GENDER is put.[20] By interrogating those purposes and asking whether they are legitimate and whether the concept currently picked out by the term serves them well, we can improve the coherence and value of our overall conceptual scheme.

Ameliorative projects should be distinguished from both *conceptual analysis* and *descriptive* projects of various sorts. Conceptual analysis is an internalist approach that probes the boundaries of the concepts we have. A conceptual analysis of negation, for example, would answer the question:

What is our (current) concept of NEGATION?

In answering, the conceptual analysis would be introspective, employing *a priori* methods and consulting our intuitions. Descriptive projects are attempts to understand how we employ a particular term, how we actually mobilize it in reasoning. For example, we might ask:

What (objective) kind, if any, our use of NEGATION pick out?[21]

Both of these projects focus on understanding an existing concept. By contrast, ameliorative projects focus not on the concepts we actually *possess* or currently *use*, but on the concepts that would be *most useful* to us, given our (legitimate) goals and undertakings.[22] Descriptive and conceptual projects analyze puzzle pieces—they explain

[20] *Haslanger 2000* explores this question, settling on an account of GENDER (and RACE) that build social features such as power relations and treatment by others into the concept picked out by these terms. *Jenkins 2016*, *Mikkola 2011*, and *Saul 2006* among others similarly take ameliorative approaches to GENDER.

[21] *Objectivity* in this sense is a matter of the unity or similarity of instances of the kind in question *Haslanger 2006*. In this case, then, the question would concern the extent to which our actual uses of negation pick out similar operations. We can transpose Plumwood's complaint into this language: Negation, as we actually use it, is a mess of pernicious dualisms, dichotomies, and mere distinctions masquerading as a single objective kind.

[22] Some notes and caveats. First, the presentation of these three distinct projects suggests bright lines between them. This is not necessarily the case, especially since ameliorative projects will generally require conceptual analysis and descriptive projects to be carried out as well. Second, the notions of 'our concept' and 'legitimate purposes' are troublesome. In both cases the reference class—who we are considering among those relevant to 'our concept' and who gets to determine whether purposes are legitimate—makes considerable difference to the final analysis. Much of the debate among practitioners of ameliorative projects concerns just this. In the case of GENDER, for example, *Haslanger 2000* argues for a concept of gender that highlights the roles of hierarchy and social structure in the deployment of gender. In doing so, Haslanger takes this laying bare the role of society, rather than self-identification, to be of paramount importance for a concept of gender. By contrast, *Jenkins 2016* rejects this account for its marginalization of trans women, arguing that inclusivity is a crucial purpose of the concept of gender. Such debates are challenging, and participants may find themselves uncertain

their shapes and describe the images printed on them. Ameliorative projects ask how well the puzzle piece fits where it's been placed. The final recommendation of a successful ameliorative project, then, is to jettison an ill-fitting puzzle piece and replace it with a better one.

So, in order to carry out an ameliorative account of a concept Φ, we first need to ask why we have a concept for Φ to begin with. Thus, in the present situation, where we are concerned with logic in general and negation in particular, we might ask:

(1) Why do we have a concept of *logical consequence?* What concept, if any, would do that work best?
(2) Why do we have a concept of *negation*? What concept, if any, would do that work best?

If we attempt to understand feminist arguments for logical revision as ameliorative projects, then the answers to these questions might include the following observations:

(1) Properly understood, the purposes of *logical consequence* are (at least partially) political or social.
(2) Properly understood, the purposes of *negation* are (at least partially) political or social.

We would then assess various logics in order to determine how well they do in terms of helping us to meet the political and social purposes in question, in addition to the other purposes identified for these concepts. A successful ameliorative argument for logical revision—one that rejected classical logic C in favor of some non-classical logic L—would require that, from the feminist perspective, L, and the negation contained in L, best fulfills the purposes—including the political and social purposes—for which we have negation.

It is perhaps useful to work through an ameliorative reconstruction of Plumwood's feminist argument for logical revision. According to Plumwood, the purpose of our concept of negation is to make harmless distinctions or dichtomies. But, this stops short of imposing the markers of pernicious dualisms: backgrounding, radical exclusion (hyperseparation), relational identity, instrumentalism, and homogenization. Given this purpose, classical negation is ill-suited to serving these purposes because it imposes the markers of dualism. Relevance negation does a better job, and thus we should replace our current classical understanding of negation with the alternative understanding of the concept provided by relevance logic ($\mathsf{L}_{\mathsf{Plum}}$).

This reconstruction of feminist arguments for logical revision in general, and Plumwood's project in particular, seems more promising than the *a priori* approach considered in the previous subsection. But there is a problem. The whole point of ameliorative projects is to *replace* a faulty concept, or a concept that is not well-suited to the purposes for which we have the concept in the first place, with a related, but improved, concept that will better do the work for which the original concept was intended. But then it seems as if we are *changing the subject*—that is, we are not explaining the concepts we actually have, but are instead endorsing a replacement of our current concepts with the improved versions involved in the amelioration.[23] W.V.O. Quine

of which moves are appropriate. Nevertheless, because these debates force us to consider the broader values etched into our concepts, we take them to be a useful consequence of undertaking ameliorative projects, rather than challenge to their general viability.

[23]This question—of whether and to what extent ameliorative projects (and the nearby *Carnapian explication*, *conceptual engineering*, and *conceptual ethics* projects) are exposed to this worry about changing the subject—is a matter of lively debate in the literature. See *Strawson 1963*, *Cappelen 2018*, and *Chalmers 2020* for discussion.

famously argues that:[24]

(1) Any revision of our basic logical concepts *always* amounts to changing the subject (because basic logic is so central to the meanings and truth conditions of the rest of language).
(2) Changing the subject is not an allowable move in debates about *the* correct logic (again, because basic logic is so central to the meanings and truth conditions of the rest of language).

We do not agree with Quine with respect to the first point.[25] But that is, for present purposes, beside the point, since only the second point is needed for the objection to succeed, and we are strongly sympathetic to the second point. The reason is simple: The logical concepts we have are fundamental, and our understanding of them is implicated in our understanding of *all* of our other concepts. Thus, if we change the meanings of And, Or, and Not, then we have not done merely that—on the contrary, if the change in meaning is significant, then presumably we have altered our understanding of *all* of our concepts. Or, as Quine would put it, logical concepts, and the basic logical laws that govern them, are located at the absolute center of our web of beliefs. Thus, any changes to those beliefs will have substantial ramifications for the rest of the web, and hence for our understandings of most, if not all, of the concepts contained in, or governed by, the web.

If ameliorative projects involve rejecting one meaning and replacing it with an alternative, supposedly better meaning, then ameliorative projects with regard to logic and logical revision involve the sort of change of subject that is Quine's target. So, this becomes a matter of replacing *all* (or nearly all) of our concepts with new ones, rather than just the target concept. Rather than replacing an ill-fitting puzzle piece with a better one, it is changing the topology of the table itself—none of the other pieces will fit the same way afterward. If this is right, then it would seem that understanding Plumwood's project, and projects like it, as ameliorative projects is a non-starter. Another way of putting the point is this: If we want to discover the norms for correct reasoning, presumably what we are looking for is an account of those norms with respect to *our* understanding of And, Or, Not, etc., rather than some alternative (albeit purported improved) account of these concepts.[26] Thus, we shall move on to our third and final option for understanding exactly what Plumwood is up to.[27]

[24]Adapted from *Quine 1986*, Chapter 6.

[25]One way of developing an alternative account is to argue that the *meanings* of the logical operators are given by some set of relatively standard introduction and elimination rule pairs for each operator. Thus, any logic that validates those rules will agree with any other logic that validates those rules with regard to the meaning of the connectives, regardless of what other inferences might also be validated by the logics in question. See *Cook 2014* for discussion.

[26]In response to this, proponents of an ameliorative approach might respond in two related ways. First, they might argue that the puzzle is *already* ill-fit to the table, and that the table really does need to be reshaped. Even if this is so, and even if it is necessary, it nevertheless seems to fall under the scope of the Quinean worry: this is changing the subject, despite the fact that the ameliorative project does not present itself as changing the subject. Second, they might construe this reshaping as simply doing what the anti-exceptionalist does. But, this is not replacing one concept with another, but rather replacing one with many, contrary to the purpose of an ameliorative project. And, even if the amelioratívist bites this bullet, they then shade into the anti-exceptionalist project we are about to outline. Recall that our goal in this discussion is not to demonstrate that any other construal is false, per se, but to show that the anti-exceptionalist approach provides the best lens through which to understand projects of feminist logical revision, like Plumwood's.

[27]It is worth emphasizing that our worries about construing feminist arguments for logical revision as ameliorative projects do not generalize to *all* ameliorative projects. Nevertheless, these worries might apply to some projects beyond arguments regarding the correct or best logic. One potential site of such worries is Kevin Scharp's ameliorative account of truth, whereby we avoid the semantic paradoxes by replacing our single notion of truth (governed by the full Tarskian T-schema) with two distinct truth concepts: *ascending truth* and

4.3. *Anti-Exceptionalism*

Simply put, *anti-exceptionalism* about logic is the view that logic is a science, and hence debates about logic, and in particular debates about which logics are correct or best, are continuous with other debates within the empirical and mathematical sciences. Ole Hjortland describes the view as follows (*2017*, p. 632):[28]

> Logic isn't special. Its theories are continuous with science; its method continuous with scientific method. Logic isn't *a priori*, nor are its truths analytic truths. Logical theories are revisable, and if they are revised, they are revised on the same grounds as scientific theories.

While anti-exceptionalism has been en vogue recently, due to a number of prominent defenses including *Priest 2006*, *Williamson 2007*, *Russell 2015*, *Hjortland 2017*, and *Hjortland 2019*, it is worth noting that the view is a good bit older. The idea that logical theories should be adjudged by the same criteria as scientific theories goes back at least to *Quine 1951*, and the first explicit argument for a non-classical logic based on what we might now call anti-exceptionalist grounds is likely Putnam's argument for quantum logic and against classical logic in *Putnam 1968*.[29]

The basic ideas underlying anti-exceptionalism regarding logic are as follows. First, theory choice in logic should be driven by the same concerns that drive theory choice in science. Thus, we should select a logic as correct or best based on considerations such as the strength, simplicity, elegance, unifying power, explanatory power, and non-*ad hoc*-ness. These judgements should be made relative to the theoretical and practical purposes to which we put the theory in question (in this respect anti-exceptionalism has something in common with ameliorative projects). With respect to logic, most anti-exceptionalists prioritize the following as the central projects towards which a successful logical theory is aimed:

(1) Formulating a consistent yet powerful formal theory of truth.
(2) Providing a foundation for at least the majority of mainstream contemporary mathematics.

Thus, we should judge our logical theories in terms of how strong, simple, elegant, unifying, and explanatory the resulting accounts of truth, and of mathematics, turn out to be with respect to these projects.

While this description of the methodology underlying anti-exceptionalism is

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descending truth, each governed by one direction of the Tarskian biconditional, amongst other principles; see *Scharp 2013*. Whether or not the 'changing the subject' objection succeeds here depends, of course, on how central the notion of truth is within our conceptual scheme, and thus on the extent to which shifting from truth simpliciter to Sharp's ascending and descending truth concepts has substantial ramifications for the rest of our conceptual scheme.

[28]For an alternative approach to the connections between anti-exceptionalism and feminist logic, see *Russell forthcoming*$_1$, which explores the ways that different variants of anti-exceptionalism might or might not be compatible with, or even entail, various positions regarding what feminist logic is and how it should be pursued. Russell's paper and the present essay are in many ways complementary. The papers were developed independently, but the ideas in both can be traced back in part to stimulating conversations at the Feminist Philosophy and Formal Logic Workshop at the Department of Philosophy and the Minnesota Center for Philosophy of Science at the University of Minnesota.

[29]Putnam's argument is a good bit more nuanced than 'quantum logic good, classical logic bad', but the caricature given above is sufficient for our purposes.

It is also worth noting that Quine was far from fully consistent with regard to his views on logic. As discussed earlier, in *Quine 1986* he argues that any divergence from the classical logical orthodoxy amounts to changing the subject and, in effect, adopting a new language that is syntactically identical to the original but with a completely different meaning. In *Quine 1951*, however, he explicitly endorses the idea that logic is, like any other field, subject to refutation and thus hostage to the same sorts of challenges as any other scientific theory.

straightforward (or, at least no less straightforward than accounts of theory selection in other sciences), applying the methodology has turned out to be somewhat more complicated. There is little consensus amongst anti-exceptionalists regarding which logic is correct or best (or which logics are best, on pluralist variants of anti-exceptionalism), even though there is agreement (for the most part) on the criteria of evaluation. For example, we learn in *Williamson 2007* that classical logic C is the best logic by anti-exceptionalist lights, but we learn that it is the paraconsistent Logic of Paradox (LP) that satisfies the relevant criteria in *Priest 2006*, while *Hjortland 2017* provides an extended argument that there is no single logic that beats out all others in terms of scientific success, resulting in an anti-exceptionalist argument for a version of logical pluralism where different logical consequence relations are best relative to different contexts or subject matters. This disagreement is perhaps predictable, however, since it likely reflects differing weights placed on the criteria relevant to selecting one logic theory as superior to another (e.g., one theorist might treat deductive power as more important than expressive power, where another might judge expressive power to outweigh deductive power).

How might we interpret Plumwood's feminist argument for logical revision (or arguments like it) as anti-exceptionalist arguments? At a first pass, we can understand the argument as claiming that we have a poor theory of negation and logical consequence. In more depth, we can begin by noting Helen Longino's observation that 'merely contextual' values may 'shape the knowledge' emerging from a scientific research program. As a result, the knowledge emerging from a scientific research program might be affected by contextual values in at least the following ways:[30]

- *Questions*: Contextual values can determine which questions are asked and which ignored about a given phenomenon.
- *Specific assumptions*: Contextual values can be expressed in or motivate the background assumptions facilitating inferences in specific areas of inquiry.
- *Global assumptions*: Contextual values can be expressed in or motivate the acceptance of global, framework-like assumptions that determine the character of research in an entire field.

Approaching scientific theory choice (including choice of logic) from a feminist perspective can, and likely will, involve a different set of 'merely contextual' values being salient, and thereby lead to different insights and perspectives on the phenomenon in question.

One particularly important way in which this might happen in the case of feminist arguments for logical revision is that, once we adopt a feminist perspective on logic, we might decide to foreground projects or questions that were deemed unimportant before adopting this perspective, or we might weight the relative importance of projects or question that were already salient differently. In particular, it seems reasonable to require that, viewed from a feminist perspective, theory choice in logic should take into account not only success with regard to building a consistent or non-trivial formal theory of truth, and accounting for the truth (and applicability, etc.) of contemporary mainstream mathematics, but should also take into account success with respect to constructing adequate theories about concepts of central concern to feminists, such as Sex, Gender, or Sexual Orientation. As a result, the correct logic, viewed in terms of the satisfaction of various criteria such as strength, simplicity, elegance, unifying power, explanatory power, and non-*ad hoc*-ness, might look quite different

[30]Adapted from *Longino 1990*, p. 86.

from the accounts developed by Priest, Williamson, Hjortland, and Russell.

This sketch gives us a basic idea of how we might understand feminist arguments for logical revision as anti-exceptionalist arguments. But is there any evidence that our central example of such an argument—Plumwood's defense of a relevance logic ($\mathsf{L}_{\mathsf{Plum}}$) as superior to classical logic C—should be interpreted in this way? After all, even if, as we suggested above, there are reasons to think that feminist challenges to logical orthodoxy are not *best* understood as either *a priori* arguments or ameliorative projects, this in no way implies that Plumwood herself would have understood her argument as an anti-exceptionalist project.[31] While Plumwood is not explicit about exactly what kind of argument she takes herself to be giving, there is at least one passage in 'The Politics of Reason' that suggests that she might well be amenable to construing her argument in these terms (*1993*, p. 454, emphasis added):

> Logic offers alternative and contested accounts of concepts such as reason and otherness. *Selection from among these accounts is made in accordance with the principles of theory selection used in other areas, and is influenced by the same sorts of social relations.* Choices for the most part reflect the perspectives of those at the centre, and theories which sit comfortably with this perspective are more likely to be successful than those which do not.

Although this is, as far as we can tell, the only place in either of Plumwood's two essays on feminist arguments for logical revision where she makes this point, her identification of the success conditions for a logic theory and the success conditions for any other scientific theory sounds very much like an explicit acceptance of what would later become known as anti-exceptionalism. At the very least, in virtue of this passage and the sophisticated arguments regarding logical revision that surround it, Plumwood deserves to be listed with *Quine 1951* and *Putnam 1968* as an important precursor to the full-fledged anti-exceptionalism developed by the later writers discussed above.[32]

Thus, it seems like anti-exceptionalism provides a fruitful framework within which we can understand feminist arguments for logical revision such as the one developed by Plumwood. Further, this sort of interpretation avoids problems to which other kinds of interpretation, such as the *a priori* and ameliorative readings discussed above, fall prey (because it does not presume a unique, rationally discernible, fundamental logic). This being said, while we do not see any similar problems with understanding feminist challenges to classical logic C as anti-exceptionalist, there are some rather significant and far-reaching consequences of such a reading that are worth highlighting before we move on. *Pace* Plumwood herself, it looks like the feminist anti-exceptionalist will likely be pressed into accepting a novel, and rather extensive, form of logical pluralism.

Logical pluralism is the view that there is more than one logic that is correct or best. Versions of logical pluralism have been defended in *Beall & Restall 2000*, *Beall & Restall 2001*, and *Beall & Restall 2006*; in *Cook 2014*; in *Shapiro 2015*; and, as already noted, in *Hjortland 2017*. Further, many see an early version of logical pluralism in Carnap's famed *Principle of Logical Tolerance* (*1959*). And, while pluralist theses of various kinds are, more often than not, compatible with or sometimes entailed by various kinds of feminist argumentation, the extant versions of logical pluralism are formulated and defended with little attention paid to anything resembling feminist concerns.[33] That being said, there does seem to be a relatively clear argumentative

[31] In fact, she could not have understood what she was doing in exactly these terms, since the term 'anti-exceptionalist' was not coined until after both *Plumwood 1993* and *Plumwood 2002* were published.

[32] For further discussion of the idea that Plumwood can be fruitfully understood as endorsing a version of anti-exceptionalism, see *Burns forthcoming*.

[33] For a singular exception, see *Yap 2010* and *Yap forthcoming*, which explore the prospects for adapting

route from the sort of anti-exceptionalist approach to logical theory choice sketched above to a rather strong version of logical pluralism.

The pluralism in question becomes apparent if we go back to Longino's observations regarding the way in which 'merely contextual' values shape scientific theory choice in various ways. Unsurprisingly, different projects will make different such contextual values salient. A central observation of feminist philosophy of science is that certain perspectives and projects (such as the unique perspectives of of women, queer people, people of color, etc.)—and hence certain contextual values—have, historically, been excluded from mainstream scientific practice. Given this, feminist philosophy of science aims to ensure that these perspectives and projects, and the contextual values that come with them, are included in scientific practice and scientific theory selection in the future. There is, however, no assumption that there is a 'correct' perspective, or a set of objectively 'best' projects.[34] Instead, we have a plurality of different perspectives and projects, and hence a plurality of legitimate 'merely contextual' values, from which to choose (with the ideal being, presumably, that we pay attention to more of them than has hitherto been the case). This, however, amounts to a fundamental challenge to standard conceptions of *scientific objectivity*: there might not be (and likely there is not) a single, completely neutral, wholly unbiased, value-independent, context-independent, 'correct' perspective (or similarly objectively 'best' set of projects); hence there might not be (and likely there is not) a single, completely neutral, wholly unbiased, value-independent, context-independent, 'correct' set of values; and as a result there might not be (and likely there is not) a single 'correct' theory codifying up the single univocal 'truth' with regard to the subject matter of most or all of our scientific investigations.

If we adopt an anti-exceptionalist understanding of feminist arguments for logical revision, then pluralism follows immediately: These challenges to the standard conception of *scientific objectivity*—that is, to the idea that there is a singular, correct, value- independent, context-independent, 'correct' scientific account of the world—should apply to logic as as much as they apply to any other scientific inquiry. As a result, there are good reasons to doubt that any particular logic will turn out to be correct (in the sense of beating out the others in some project/perspective/values independent sense) on a feminist-inflected version of anti-exceptionalism.

And this would then lead to a radical new sort of *logical pluralism*, quite different from previous versions of logical pluralism (including the version developed in *Hjortland 2017*, which is anti-exceptionalist but does not take feminist concerns into account). On this sort of logical pluralism, the multitude of 'correct' or best logics would not stem from there being different subject matters that obey different logics (and in *Shapiro 2015* or *Hjortland 2017*); or from there being different languages (with different logics) that we can adopt, or not, as we wish (as in *Carnap 1959*); or from there being different logical consequence relations that might interest us (as in *Beall & Restall 2000*, *Beall & Restall 2001*, and *Beall & Restall 2006*). Instead, the plurality of 'correct' or best logics would stem from a deeper indeterminacy with regard to which scientific theories correctly or best describe the world.[35] It is perhaps worth noting

Carnap's Principle of Tolerance to feminist projects.

[34]There may be a singular best project, and hence a singular best logic, but the existence of such is not an assumption of the framework. Some feminist philosophers of science do explicitly deny the existence of such uniquely best projects. Denying the existence of a 'best' scientific project, however, is compatible with the claim that some projects are objectively better than others. Put bluntly, the point is that scientific projects can be partially ordered with respect to 'goodness' without there being a 'top' element in the ordering.

[35]It should be noted, further, that this descriptive and methodologically-produced indeterminacy does not necessarily dissolve into a form of anti-realism or thoroughgoing relativism. The fact that there are different

again that it is exactly here where our paradigmatic example of a feminist argument for logical revision – Plumwood's – diverges from the 'best practices' picture of such an undertaking being developed here: while Plumwood can arguably be understood as an anti-exceptionalist, she is definitely a monist about logic.[36]

Here, one might raise two worries. First, one might worry that this is merely yet another argument for pluralism—why do we need this odd *feminist* argument for logical pluralism if we already have a suite of other (asocial, apolitical) arguments against logical monism? But, we see this argument as providing a measure of convergence. We see it as a strength of the feminist argument that it leads to denial of monism; the convergence of independent paths onto this same conclusion buoys each of them. Second, one might wonder whether this is *feminist* at all.[37] Pluralism, after all, isn't necessarily feminist (as the existence of non-feminist arguments for pluralism might suggest). And this is correct: pluralism itself is not feminist. However, feminism concerns not only *content* but also *method.* Much of the work carried out under the aegis of feminist standpoint theory and feminist philosophy of science concerns changing the methods with which we approach knowledge-gathering enterprises, not just the altering the content that results from making these changes.[38]

This brings us back to a point we made at the beginning of this essay. We noted in §1 that we had no interest in exploring the idea that there might be different logics that governed the reasoning of different social groups (e.g., an account where logic ($\mathsf{L_W}$) provides the norms that govern reasoning carried out by women, and some different logic ($\mathsf{L_M}$) provides the norms that govern reasoning carried out by men). At this point, however, one might be tempted to raise an objection to that dismissal: On the anti-exceptionalist understanding of feminist arguments for logical revision we obtain a picture that appears similar. We have an account where the logic ($\mathsf{L_{P_F}}$) provides the norms that govern reasoning carried out with respect to some perspectives and projects (feminist ones), whose correctness on anti-exceptionalist grounds is relative to the contextual values tied to those perspectives and projects, and where the distinct logic ($\mathsf{L_{P_N}}$) which provides the norms that govern reasoning carried out with respect to a different set of perspectives and projects, whose correctness on anti-exceptionalist grounds is relative to the contextual values tied to this second set of perspectives and projects (non-feminist ones). As the subscripts we have used suggest, the projects and goals taken to be important to feminists—or, put a bit more carefully, the projects and goals that are important with respect to feminist perspectives—may well be quite different from the projects and goals that are taken to be important from a perspective

logics that are correct for different projects does not amount to a claim that all projects are equally worthwhile and hence all logics are equally good. For example, the existence of an unjust, patriarchal project and a best logic for that project does not imply that any political movement—such as feminism—ought to respect that project.

Moreover, we take it, even if there are genuinely worthwhile, and equally worthwhile, scientific projects with distinct best logics, this kind of indeterminacy is compatible with the sort of scientific objectivity achieved through intersubjective agreement suggested by *Popper 1959* and by feminist philosophers of science, such as *Longino 1990.* This is our preferred understanding of the view sketched here.

For the feminist philosopher who prefers a more robust, more traditional form of scientific objectivity and realism than that found in Popper, and Longino, one can focus on the fact that this indeterminacy, since it is intimately linked to the ways we do and should investigate the world, can be understood as affecting merely the methodology, but not the metaphysics, of science from within the epistemic-normative conception of logic.

[36]It is also worth noting that contemporary logical pluralism was only just emerging as a serious position in philosophy of logic when Plumwood's second essay on feminist logical revision appeared.

[37]We thank an anonymous referee for bringing this worry to our attention.

[38]For discussion of knowledge-gathering and -creating processes in standpoint epistemology, see *Collins, P. H. 2002*, and for methodological challenges in feminist philosophy of science, see *Longino 1990.*

that does not take feminist concerns to be central.[39] The differences in the projects undertaken by, and the resulting values mobilized by, work on logical theories carried out from feminist perspectives and work on logical theories carried out from the perspective of explicitly anti-liberatory, anti-progressive positions will no doubt be even more striking.[40]

Importantly, however, this objection is mistaken: Each of these logics will be taken to be correct *tout court*—that is, as governing all reasoning, carried out by all reasoners—by the theorist who endorses the logic in question from within their particular projects, and relative to their particular goals. As a result, although we reject the idea that different logics are correct for different communities, our feminist analysis of anti-exceptionalism regarding logic does suggest that different logics will be correct relative to different projects (and the values that come with such), where these different projects may well be important to different groups.[41] In short, the logic (or logics) correct relative to the projects important to feminists might well be distinct from the logics that are correct relative to the projects important to non-feminists. Thus, insofar as we have reason to regard particular projects as important—be they reasons anchored in morality, science, politics, etc—we have reason to regard these logics as important.

5. Feminist Logic and Pedagogy

We will conclude this essay with some preliminary thoughts on what consequences successful feminist arguments for logical revision might have on the way in which we teach logic in the classroom and elsewhere. The question is simple: Suppose that feminist objections to classical logic (whether we understand these as *a priori*, ameliorative, anti-exceptionalist, or in some other way) are successful, and as a result we take some non-classical logic L to be correct, or at least better than classical logic C. How should this affect the way in which we teach logic at the introductory level, where traditionally C is taught as correct (either explicitly, or implicitly in virtue of no other competing logics being identified or discussed)? Do we continue to teach classical logic C? If so, how do we frame this content? Or do we teach students the 'correct' logic L at the introductory level, despite the fact that non-classical logics are typically much more complicated both semantically and proof-theoretically?[42]

[39]The fact that the projects taken to be of central importance in extant (not explicitly feminist) anti-exceptionalist work on logical theories (formulating theories of truth, and accounting for the foundations of mathematics) are quite distinct from the projects taken to be of central importance in feminist anti-exceptionalist work such as Plumwood's (formulating adequate theories of Gender and Sex) provides an example of such a difference.

[40]We do not mean to imply that any of the anti-exceptionalist work cited in this essay is carried out from within such an anti-feminist stance, or that any of the prominent anti-exceptionalists discussed above are in any way anti-feminist. In particular, Gillian Russell has, as we have already noted, done important work on feminist logic (*Russell forthcoming*$_2$, *Russell forthcoming*$_1$), and *Burns forthcoming* seems to implicitly endorse anti-exceptionalism in her discussion of Plumwood's work as a sort of proto-anti-exceptionalism. Nevertheless, we do believe that much of the work on anti-exceptionalism suffers from not taking distinctly feminist considerations such as those mobilized by Plumwood into account, and from not attending sufficiently to recent work in feminist philosophy of science more generally.

[41]Here, it should be emphasized that this is not Plumwood's position, as Plumwood herself is a logical monist.

[42]It is worth noting that philosophers of logic who reject classical logic C in favor of some non-classical logic L for *non-feminist* reasons (a group that includes at least one of the authors of this essay) are faced with a superficially similar question: Can such logicians, in good conscience, teach classical logic without qualification at the introductory level? While this is a legitimate question, the stakes seem lower—at least in those cases where, unlike with feminist challenges to logic, the rejection of classical logic C is not based on more general

A satisfactory answer to this question will presumably have to be in line with feminist pedagogy more generally. Carolyn Shrewsbury provides a nice summary of feminist approaches to pedagogy (*1987*, p. 6):

> Feminist pedagogy begins with a vision of what education might be like but frequently is not. This is a vision of the classroom as a liberatory environment in which we, teacher-student and student-teacher, act as subjects, not objects. Feminist pedagogy is engaged teaching/learning—engaged with self in a continuing reflective process; engaged actively with the material being studied; engage with others in a struggle to get beyond our sexism and racism and classism and homophobia and other destructive hatreds and to work together to enhance our knowledge; engaged with the community, with traditional organizations, and with movements for social change.

While we cannot address all the nuances of this issue here, we take it to be clear that logic, in virtue of its capacity to help us clarify and communicate our own and others' understandings of the world, can facilitate many aspects of this project. Further, we do believe that feminist logicians can continue to teach classical logic C in the introductory classroom—even if some non-classical logic L turns out to be correct by feminist lights. Our brief defense of this claim hinges on the idea that what needs to be attended to carefully is not *which* logic we teach, but *how* we teach that logic.[43] We will give two brief, inter-related arguments to illustrate what we have in mind.

First, we will give what we will call the *pragmatic argument*: Even if some non-classical logic L turns out to be correct, or at least superior to C, when judged from a feminist perspective, we must deal realistically with the fact that C is, in a precise, mathematical sense, the simplest (non-trivial) logic. Not only is the semantics and proof theory of C simpler than the semantics and proof theory of most (if not all) non-classical logics, but the semantics and proof theory for the vast majority of non-classical logics are obtained via starting with the semantics and proof theory for C and then making various changes, complications, and additions. Thus, even if C is incorrect, there are strong pragmatic, practical reasons for teaching students C *first*. If this is right, however, then—and this is the crux of the matter—the fact that students are taught C first because of its *simplicity*, rather than because of its (putative) *correctness*, should be emphasized much more strongly in our teaching.

The second argument for continuing to teach C at the introductory level we will call the *political argument*: Even if some non-classical logic L turns out to be correct, or at least superior to C, when judged from a feminist perspective, there is still value in learning C as part of the project of understanding the mechanics of oppression and the epistemic tools of the oppressor. Even if Lorde is right that one can't dismantle the master's house using the master's tools, understanding the tools that the master used to construct the house is nevertheless likely to be helpful. The fact that classical logic is, arguably, the best formalization of the reasoning actually accepted as correct in the bulk of mainstream mathematics, empirical science, philosophy, politics, sociology, psychology, statistics, economics, and other areas of intellectual or theoretical inquiry means that understanding this reasoning, and teaching our students to understand it—regardless of whether it is *good* reasoning—is a particularly important part of feminist liberatory pedagogy. Thus, even (especially?) if C is incorrect, there are strong

social, political, and moral concerns.

[43]Of course, there are broader questions regarding *how* we should teach logic that address much more than merely the decision whether to teach classical logic (or to teach it first), and answering many of these will no doubt require more carefully investigating *why* we teach logic to students in the first place. We cannot address such larger issues here. Hence we intend this section to be merely a brief investigation into one very rich and interesting, but admittedly narrow, aspect of this larger project.

strategic/socio-political reasons for teaching students C (as well as teaching them competing non-classical logics L, of course). If this is right, however, then—and, again, this is the crux of the matter—the fact that students are taught C first because of its *ubiquity* (and possibly because of its role in oppressive conceptual schemes), rather than because of its (putative) *correctness*, should be emphasized much more strongly in our teaching.

In her epigraph to 'The Politics of Reason: Towards a Feminist Logic', Plumwood (*1993*, p. 34) cites *Frye 1983*'s description of the insidious effectiveness of naturalistic attitudes toward structurally oppressive phenomena:

> For efficient subordination, what's wanted is that the structure not only not appear to be a cultural artifact kept in place by human decision or custom, but that it appear natural – that it appear to be a quite direct consequence of the facts about the beast which are beyond the scope of human manipulation or revision. It must seem natural that individuals of the one category are dominated by individuals of the other and that as groups, the one dominates the other.

This idea motivates much of Plumwood's work, and we take it that both of the arguments just provided serve to undermine this same sense of immutability and naturalness, as it applies to standard logical pedagogy and the uncritical teaching of classical logic.

Thus, we arrive at the following position. C should continue to be taught at the introductory level, because of its simplicity, because of its central technical role in the formulation of other, more complicated non-classical logics, and because of the fact that it is the logic that best codifies actual reasoning in the academic and professional disciplines whose practices are often the targets of feminist critique. When teaching introductory logic, however, we should emphasize these reasons—and not the supposed *correctness* of C—as explaining why introductory logic courses have this focus. In short, even if feminist arguments for logical revision are right, it is not the *fact* that C is taught in introductory logic courses, but the *way* it is taught, and, in particular, the way that we *frame* it, that is the issue.

But this brings us to a final, and we think somewhat surprising conclusion: If feminist arguments for logical revision are correct, or even plausible, then it is important that philosophy departments (at least, those that take feminist philosophy and its concerns seriously, which of course *should be* all departments) provide students with access to instruction on those logics that *are* plausible candidates for being the 'correct' or 'best' logic or logics. There is little to be gained from informing students that classical logic might not be the right logic if we do not provide students with the opportunity to explore better (or 'best') logics. Further, these additional courses should not only introduce students to non-classical logic, and teach traditional debates about and arguments for these logics (i.e., those that focus on the paradoxes, or on constructive mathematics, or on verificationism, etc.), but they should also involve material on the distinctive *feminist* challenges to classical logic found in the work of Plumwood and others. As a result, feminist challenges to classical logic provide us with reasons—explicitly feminist reasons—for ensuring that our curricula include more advanced courses or modules on the non-classical logics that arguably beat out classical formalisms with respect to feminist projects, perspectives, and goals. This conclusion—that feminists should demand more, and better, logic instruction in philosophy curricula—is one that we suspect many feminists, especially those that work outside logic, will find surprising. But this is all the more reason to scrutinize those intuitions and take seriously the possibility that it is the rhetorical abuse of logic, not

logic itself, that has led to our distrust of formalism. We hope that this argument will empower feminists to take hold the tools of logic and build houses of their own.

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