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ORIGINAL ARTICLE

Theology as social knowledge

Meghan D. Page

Department of Philosophy, Loyola University Maryland, Baltimore, MD, USA
Email: mpage1@loyola.edu

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Abstract

This article summarizes how problems in formalizing scientific inference led to the production of social accounts of science, offering Helen Longino's feminist contextual empiricism as a way forward. Rather than focus on rules of inference that connect knowledge-claims, Longino constructs norms for knowledge-producing communities which, when followed, ensure equitable dialogue and transformative criticism. It is further argued communities engaged in Christian systematic theology would benefit from developing a similar set of norms, given that theological inference is similarly rooted in social cognition and faces many problems analogous to those with which Longino is concerned. Finally, the extent to which Longino's norms may serve as a starting point for theological communities is explored.

Keywords: Longino; social epistemology; empiricism; underdetermination; philosophy of science

Introduction

Inference, in the most general sense, denotes the movement from one belief to another; to infer x from y is to say that the truth of x guarantees or at least suggests the truth of y. Logic is the study of inference, and is usually divided into two branches: formal logic, which focuses on how truth moves through formal languages with strict syntactical rules, and informal logic, which studies all other forms of inference. Of course, the use of inference is an inherent part of academic (and ordinary) life. All disciplines of thought rely on communally accepted forms of inference, governed by either tacit or implicit norms, to engage in shared conversation about the nature of the world.

In the early twentieth century, a group of philosophers took on the project of studying scientific inference through the lens of formal logic. The project was largely motivated by exciting developments in science at the beginning of the twentieth century, such as Sir Arthur Eddington's empirical confirmation of Einstein's General Theory of Relativity and Jean-Baptiste Perrin's confirmation of Einstein's theory of Browning motion.[1] Logical positivists (as they came to be known) were impressed by the ability of the scientific community to resolve conflict and theoretical disputes in an objective way; scientists were able to converge on a single perspective through careful attention to empirical facts. This kind of unifying inference was especially appealing in the face of the increasing political instability in Europe, and seemingly irreconcilable and polarized conceptions of how Western society ought to progress. Moreover, scientists like Einstein used formal, mathematical

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inferences to make predictions about the future which were eerily accurate. Science was clearly latching on to the world, and the positivists decided to figure out how, precisely, science worked from an inferential perspective – given that scientific inference was so successful. This project served as the modern foundations for the subdiscipline of philosophy known as philosophy of science, and philosophers of science continue to wonder about what makes for a good scientific inference.

However, the positivists worked under a number of assumptions about the nature of scientific inference which they later abandoned. Though there is significant disagreement about what specifically these assumptions were and to what extent they were adopted by various members of the project, there was a general sense that scientific inference could be formalized. In other words, the positivists hoped to find rules for successful scientific inferences that operated like the rules of deductive logical languages; on this picture, there is a clear method for evaluating the reliability (and accuracy) of a scientific inference. Each step of the inference would follow a truth-preserving rule (or world-governing law), and each part of a scientific explanation would be clearly justified just like a line of a proof. This picture, frequently called the deductive-nomological model of scientific explanation, assumed the laws of the world described the movement of matter like the rules of a logical language describe the flow of truth among a set of propositions. It offered hope that the formalization of scientific inference would insulate the pursuit of knowledge from subjective bias and personal opinion.

Of course, it is no secret that the project failed: it turns out there is no obvious and indisputable way of translating our experience of the world into a formal language. The project came under increasing pressure due to both external critiques rooted in the history of science (most famously Kuhn's) as well as internal critiques, such as the abandonment of the analytic/synthetic distinction by Quine. Both forms of critique brought attention to the role that communities play in the formation of scientific inference, the influential role of social forces on scientific (and linguistic) development, and the impossibility of finding an objective justification for each choice in the construction (and adoption) of scientific theories. The aftermath of these critiques is often represented as a fork in the road, leading some to treat scientific knowledge as merely subjective while others maintained that scientific methods are themselves objective but susceptible to corruption through social influences. Philip Clayton, theologian and philosopher of science, illustrates this type of bifurcated view in his paper 'Philosophy of Science, What one Needs to Know', where he summarizes key developments in the philosophy of science which led to the rejection of the deductive-nomological model of scientific inference or what he calls the 'received view'.

> ... the Received View, in its strict form, is no longer acceptable as a description of (or prescription for) science. The hotly debated question then becomes: How radically should the new view of science diverge from the Received View? If the 'objective' picture of scientific activity and theories is untenable, how far toward the 'subjective' end of the continuum should we place the scientific project? (Clayton 1997, 98)

While it is common to taxonomize post-positivist views in this way, attempting to plot views of scientific inference along an objective/subjective continuum obscures some of the most interesting work in contemporary philosophy of science. For many philosophers, the main project continues to be modelling scientific inference, with the critiques of positivism fuelling philosophers to ask increasingly nuanced questions and develop more complex models. What are the ways various methods of reasoning work together when generating scientific claims? What specific roles do social and contextual features play in scientific inferences?

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One exemplar of a post-positivist account of scientific inference that interweaves both social and empirical threads is Helen Longino's feminist contextual empiricism (Longino 1990, 2002). Longino begins with critiques of positivism, taking them to reveal a problem I term inferential underdetermination: the connection between experience, which is fundamentally non-linguistic, and scientific facts, which are linguistic, cannot be bridged simply by syntactical rules. What bridges this gap, according to Longino, are social interactions. However, while scientific inference is irreducibly reliant on social inference and therefore cannot be purely described by linguistic rules, social cognition is itself rule-apt. Longino reorients the search for linguistic rules to a search for effective communal norms; the implementation of such norms, she argues, eradicates individual bias through meaningful dialogic interaction. Longino attempts to satisfy the positivistic hope for rules that would create objective knowledge production by offering norms for communal dialogue that produces unbiased intersubjective knowledge of the world.

Longino's work helped pioneer a significant movement in philosophy of science towards social epistemology; as Heather Douglas (2023, 127) notes:

> Philosophers such as Helen Longino, Miriam Solomon, and John Hardwig noted that knowledge did not emerge, and could not be wholly validated, by individuals pursuing science alone. It was in social groups that knowledge was generated, debated, tested and confirmed.

However, Longino's work, and social epistemology in science more generally, has received little attention from theologians, presumably because its focus is on knowledge production in empirical communities and theology is not, strictly speaking, an empirical community. Nevertheless, the contours of Longino's account illuminates important questions about theological inference and creatively reframes discussions about theological methodology. There is a strong analogy between the indeterminacy posed for scientific inference and indeterminacy found in theological inference. Moreover, theological inference also relies on social cognition to navigate this indeterminacy. In light of these similarities between the structure of scientific knowledge production and theological knowledge production, the solution Longino suggests for eradicating subjective bias in science may also prove useful for the elimination of individual and communal bias in the construction of theology.

In this article, I present Longino's feminist contextual empiricism specifically for consumption by theologians and philosophers of religion. After presenting the view, I argue the problem Longino describes for scientific inference is strongly analogous to problems in inference that arise for Christian systematic theology. I further suggest Longino's solution, which shifts the focus of scientific inference from linguistic rules to communal norms, may also be a helpful corrective for thinking about theological inference. Finally, I use Longino's norms for science as scaffolding to consider how we might begin the project of developing norms for communities engaged in theological knowledge production.

The idea that Christian theology is constructed rather than discovered is nothing new – nor is the more specific claim that knowledge of God is ultimately dialogic knowledge and is mediated through communities. Related views have been defended by a number of theologians. Nevertheless, I take this framing of the problem to be uniquely helpful in its analogy to scientific knowledge. My hope is that this argument for adopting a dialogic, intersubjective picture of theological knowledge production will make it more palatable to theologians who view scientific and/or logical rigor as the ideal standard of justification.

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Underdetermination in scientific inference

According to Kyle Stanford (2023), underdetermination in science is 'the simple belief that the evidence available to us at a given time may be insufficient to determine what beliefs we should hold in response to it'. Underdetermination stands in contrast to determination (or overdetermination) in science, where some initial conditions (together with the laws of nature) guarantee a certain outcome (or perhaps doubly or triply guarantee, in the case of overdetermination). Contemporary discussions of underdetermination in science often trace back to Pierre Duhem's *Aim and Structure of Physical Theory* (1954), and Quine's interpretation of Duhem's work in 'Two Dogmas of Empiricism' (1951). Duhem argues the failure of an experiment is insufficient evidence for falsifying the experimental hypothesis; this is because the connection between the hypothesis and the experiment is mediated by numerous background assumptions, any of which (if false) may account for the failure of the experiment. Quine later connected Duhem's worries about underdetermination in scientific experimentation with his own concerns about the analytic-synthetic distinction, suggesting underdetermination is a consequence of interconnections between beliefs. Whenever we arrive at a false conclusion, there are infinite ways we might reorient the web-of-beliefs to produce a different conclusion, so it can be hard to determine what new evidence tells us. Of course, the more general idea that some set of information we have may be insufficient to determine a certain judgement extends far into the history of philosophy, bearing much in common with the notion of equipollence discussed by both ancient and modern skeptics.

In recent years, discussions about underdetermination in science tend to fall into two broad categories, which I shall call theoretical and inferential. Theoretical underdetermination centres on questions about the relationship between available evidence and our best scientific theories and is often couched in terms of empirical equivalence. Two (or more) theories are empirically equivalent if they have identical empirical consequences; that is, they imply all the same observation sentences. The underdetermination worry, then, is how might we choose between these equivalent theories. Theoretical underdetermination is often connected to discussions of realism and anti-realism; for example, if we think there is more than one possible theory for a given body of evidence, should we suspend our judgement about the metaphysical reality of the theory (despite finding it useful)? If we appeal to non-epistemic reasons in theory choice, are theories merely pragmatic rather than ontic? While these are live and important conversations in the philosophy of science, and may be of interest to certain theologians, in this article I will leave them aside to focus instead on inferential underdetermination.

In a very general sense, an inference is the route that takes us from one knowledge point to another. An inference may be as simple as concluding we will have four oranges between us if you add your three to my one, or as complex as predicting a change in oceanic circulation by feeding a vast array of climate measurements into an earth systems model. Rule-based, determinate inferences occur in many formal systems, such as propositional logic, where formal rules can be applied to show that certain premises necessitate certain conclusions, or in logic-based games, such as Sudoku, where the starting conditions of a puzzle (together with the rules of the game) uniquely determine one possible solution. Underdetermination as it relates to inference occurs in epistemic contexts where the evidence, or the inferential input, together with the best methods or rules of inquiry, do not guarantee a particular conclusion or solution. For example, in contrast to Sudoku, crossword puzzles do not always have unique solutions. The clues provided may suggest more than one possible answer, and, at times, filling out the rest of the crossword does not erase this potential ambiguity. As a result, more than one 'solution' may be possible (even if a single solution is specified by the crossword creator). In epistemic contexts

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like crosswords, the inferential inputs (the clue, the number of letters, the intersecting words) do not (always) determine an output; underdetermination in inference involves a gap between the inferential input and the inferential output.

While theoretical underdetermination also involves an inferential gap it focuses on one particular gap (between the sum of all empirical evidence and empirically equivalent theories) rather than the more heterogenous issue of underdetermination between evidence and hypothesis that is par for the course in scientific practice. As Helen Longino writes,

> If we start not from questions about theories and general theses about scientific theories, concerns about realism, or the cognitive authority of science, but from questions arising from the examination of particular episodes of scientific investigation occurring now, what might be called underdetermination has a different cast (Longino 2016, 11).

For Longino, inferential underdetermination in scientific practice is driven by the semantic gap between what the data-language describes and what theoretical language refers to. For example, consider using a set of tree ring measurements to infer historical temperature change in a certain region over time. Descriptions of the data will involve the radii and width of various rings within the tree, while the hypothesis will be about changes in degrees Celsius. Longino argues that there is no purely formal relation that connects sentences about tree ring radii and sentences about degrees Celsius. The inferential relation between the data and the hypothesis involves a host of background assumptions and methods of interpretation, all of which come to bear on the success of the inference. Longino offers many examples of this semantic gap in scientific practice, including

> the difference in content between descriptions of patterns of tracks in cloud chambers and claims about the behavior of elementary particles, or patterns of hemoglobin oxygenation and deoxygenation in brain tissue measured via magnetic resonance imaging and claims about specific brain/mind activity or between recordings of seismic activity on the surface of the earth and claims about the deep structure of the planet. (Longino 2016, 11–12)

The semantic gap between the data-language and the hypotheses the data is intended to confirm is especially significant when considered against the background of logical empiricism. The empiricists aimed to formalize scientific inference; Longino suggests that a purely formal relation between the observation sentences that confirm a hypothesis and the hypothesis itself is impossible. One might think Longino's worry is easily avoided if we include in our language an identity sentence that connects, for example, tree ring width x with temperature y. Longino's point, however, is that this sentence must be introduced as a postulate, and its truth must be grounded in background assumptions external to the language in which it is formulated. Tree rings are not temperatures, resulting in a semantic gap between what is described by our observation language (used to describe the trees) and what is described by the scientific theory (which focuses on temperature).

As she writes,

> except in the case of empirical generalizations, there are no formal connections between theoretical hypotheses and the empirical data brought forward as evidence for them. Such formal connections (as articulated, for example, in the logical empiricist account of confirmation) would guarantee the relevance of data to hypotheses. In the absence of such formal, logical, connections, data acquire their status as evidence for some hypothesis or other in virtue of background assumptions that establish the

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> relevance of the data to the plausibility or acceptability of the hypothesis. This is what is known as the problem of underdetermination: data underdetermine hypothesis evaluation. (Longino 2016, 5)

But despite this lack of formal connections, scientists continue to use data sets to evaluate hypotheses – how, then, is the relevance between evidence and hypothesis determined? Longino argues the gap is bridged by processes that are irreducibly social; groups of knowers employ context-sensitive background assumptions to mediate the relationship between data and hypothesis. Consider again the difference between a Sudoku puzzle and a crossword. To solve a Sudoku puzzle, one need only know the rules of the game and a specified number of deductive techniques; no additional knowledge is necessary. The knowledge required to solve crosswords, however, extends far beyond the rules of the game and techniques for solving the puzzle; crossword inferences draw on a wide range of background assumptions and context-sensitive knowledge. One way of understanding Longino's point is that scientific inferences are more like crossword inferences than Sudoku inferences; the relation between evidential inputs and confirmation outputs are not merely formal but contextual and social.

But if there are no formal connections between data or evidence and the hypotheses they confirm, what prevents such inferences from being arbitrary? What makes scientific knowledge more than just a matter of opinion? If science is social, how can it be viewed as de-politicized or neutral, or used to arbitrate disagreements between groups? These worries are heightened when one realizes that science, unlike crossword puzzles, may well be an undesigned game. While crossword puzzles contain indeterminate inferences, some solution has been pre-designated by the crossword creator as the 'proper' one, and this may serve as a criterion for judging when the puzzle is solved. However, we have no reason to assume this is the case for science; researchers work to order and schematize data observed in an organized way but there is not a pre-determined solution to the game – and even if there were such a solution, it is not available in the back of any textbook. This highlights the constructive element of science. Scientists are working together to generate a map of the world but there is no existing map against which they can check their work. This is not to say that any map will do, but that choices about how the map will look are not settled simply by 'how the world is', or by appeals to which map looks most like some allegedly existent yet to be discovered objective map, but by weaving together the various standpoints from which the interlocutors see the world.

Although the role played by social dynamics in the construction of scientific knowledge has been taken by some philosophers and sociologists to undermine its epistemic significance, Longino argues to the contrary in her early work. Given that science is an undesigned game with indeterminate inferences, we cannot expect scientific outcomes to be 'objective' in virtue of their correspondence with some true and absolute standpoint. Instead, scientific knowledge becomes objective knowledge through dialogic social interactions. It is these conversations (rather than formal rules) which serve to justify and verify scientific claims. However, in order for science to maintain the neutrality and objectivity suggested by the 'subject-world' knowledge narrative, it is important these social interactions occur in balanced and equitable ways so as to avoid producing 'knowledge' that reinforces the political agenda of the ruling class.

According to Longino, the only check against the arbitrary dominance of subjective (metaphysical, political, aesthetic) preference in such cases is this critical interaction among the members of the scientific community or among members of different communities. There is no higher authority or transcendent aperspectival position from which it is possible to adjudicate among foundational assumptions. Longino takes the underdetermination argument to express in logical terms the point made by the

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sociologically oriented researchers: the individuals participating in the production of scientific knowledge are historically, geographically, and socially situated and their observations and reasoning reflect their situations. This fact does not undermine the normative enterprise of philosophy but requires its expansion to include within its scope the social interactions within and between scientific communities. What counts as knowledge is determined by such interactions (Longino 2019).

Longino terms the critical dialogue that produces scientific knowledge transformative criticism. Transformative criticism does not describe a particular method of dialogue, but denotes the heterogenous ways communities transform subjective, situated, context-laden standpoints into objective knowledge. There is no rigorous set of rules a scientist can follow in order to individually obtain an objective standpoint; knowledge just is situated. However, when multiple subjective standpoints are brought together into norm-governed and equitable dialogue, the output of such interactions is what Longino calls objective knowledge; bias is worked out through dialogue and individual standpoints are woven together into a tapestry of truth.

Given that social interactions are what transform the subjective into the objective, the social model of scientific inference intersects with worries from sociologists about the involvement of colonization in the development of Western knowledge narratives and the role social confirmation plays in suppressing marginalized voices. Anibal Quijano, a Peruvian sociologist, was one of the first to write about the colonization of knowledge. As he and other Latin American sociologists point out, much of colonization happened not only in the domination of land but also in an imperialism about ideas.

> In the beginning colonialism was a product of a systematic repression...The repression fell, above all, over the modes of knowing, of producing knowledge, of producing perspectives, images and systems of images, symbols, modes of signification, over the resources, patterns, and instruments of formalized and objectivized expression, intellectual or visual ... It was followed by the imposition of the use of the rulers' own patterns of expression, and of their beliefs and images with reference to the supernatural. (Quijano 2007, 169).

Quijano further connects the colonization of knowledge to the Cartesian narrative that knowledge is a relationship strictly between the subject (or knower) and the world (Quijano 2007, 172). This is the picture that undergirds the 'isolated genius' narrative, and obscures the way knowledge production is influenced by a community. However, as Quijano and many others illustrate, knowledge producing communities may function in inequitable ways which serve to elevate the voices and views of those in power and further silence the marginalized, all under the guise of objectivity. Therefore, in order for social inference to in fact transform the subjective into the objective, as Longino argues it can, the norms of the community must prevent imbalances of power and maintain equity, encouraging the expansion of existing knowledge to include the standpoints of the marginalized.

In other words, we ought not limit our assessment of scientific knowledge to features of the data itself or some abstract relationship between data and hypothesis, but must also consider the communities in which the knowledge was produced. To make this possible, Longino (2019) offers the following four norms for knowledge-producing communities:

1. The provision of venues in which critical interaction can take place.
2. The uptake of critical intervention as demonstrated in change of belief distribution in the community over time in a way that is sensitive to the critical discourse taking place within that community.
3. Public accessibility of the standards that regulate discourse.
4. Tempered equality of intellectual authority.

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The first norm is both grounded in and supports the social nature of science. Because scientific objectivity is generated by social interactions, scientific communities must prioritize and provide spaces for these critical interactions to take place. Despite the isolated genius narrative often ascribed to the process of scientific discovery, no individual can obtain objective knowledge on her own; objectivity can only be obtained communally. However, to ensure interactions in a community of knowers expands knowledge through the inclusion of previously unrepresented standpoints, the second norm recasts a potential criticism of science (that it changes over time) as a feature rather than a bug. Because knowledge is constructed, and becomes increasingly objective through critical interactions, we should expect consensus to change over time and as a product of such interactions. Lack of change in a scientific community does not suggest that the community has obtained the correct or mind-independent perspective (as for Longino, no such perspective exists), but is often a sign the community has imbalanced power dynamics which prevent transformative interactions from taking place. The third norm speaks to the importance of transparency; disciplinary norms about how evidence is evaluated, what counts as an exemplary instance of good science, what is accepted but only provisionally, and so on, ought to be explicit rather than tacit.

The final norm has been one of the most disputed in the literature, as it appears to undermine the value of expertise and the intellectual authority presumed to ground scientific communities. Some have interpreted tempered equality as suggesting everyone in the community has an equal vote, and the majority rules. Such a process would be problematic, especially in current socio-political landscapes where many members of the broader community participate in conversations about science without any of the experience or training afforded to experts producing much of the research. However, according to Longino (2019), the norm 'means that any perspective has a prima facie capacity to contribute to the critical interactions of a community, though equal standing can be lost owing to failure to engage or to respond to criticism'. In other words, anyone is free to ask questions and participate in dialogue, but to maintain epistemic standing in the dialogue also requires engagement with and response to criticism in ways that accord with the community's explicit standards. The failure to engage with such meaningful criticism may result in a loss of epistemic standing in the community. On this model, expertise is likely to prove important because it equips one with the relevant skills for engaging with transformative criticism in a meaningful and productive way.

To summarize, then, Longino argues the inferential gap between data and theory is closed by social cognitive processes. Rather than conclude that the social nature of science undermines its epistemic significance, Longino argues social interactions are required for the construction of objective knowledge. Recognizing the inherently social nature of science ought to motivate a greater emphasis on the evaluation (and construction) of healthy knowledge-producing communities. Objectivity in science is not about conforming with some mind-independent truth; instead, it is the transformation of subjective standpoints by means of critical engagement and equitable dialogue. Such dialogue is equitable insofar as it interweaves multiple perspectives rather than reinforcing one to the demise of all others. Objective knowledge can only be obtained via communities that adhere to the norms of public critical dialogue, uptake of criticism that produces change, transparent standards, and tempered intellectual authority.

It's worth noting Longino's work problematizes any account of the relationship between science and theology that portrays science as decontextualized and theologically neutral. Science is social; the sort of knowledge it produces is connected to the norms and aims of the community, and the way power has been distributed throughout it. Moreover, recognizing that the colonization of knowledge often occurs by holding one community's epistemic

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standard up as the ideal further calls into question attempts to 'make theology more like science'.

Although I take these points to be important, I will not give them much attention here. Instead, I will consider whether the move Longino and other social epistemologists make concerning scientific inference – shifting the focus from rules that mediate the relationship of an individual knower to an object to norms that govern communities where knowledge is produced – may also prove helpful in thinking about theological knowledge production. In the next section, I argue theology is analogous to science in terms of inferential underdetermination: theological 'data' (or sources) do not bear any direct linguistic connection to theological claims, and the confirmation of theological views cannot be mediated simply by closer attention to the sources. I further argue what mediates the gap between these sources and the claims they are taken to support is social. In order to enhance the quality of knowledge produced in these communities, and to avoid the colonization of knowledge as described by Quijano, theology would do well to develop explicit communal norms for the production of theological knowledge. Finally, I offer an assessment of to what extent Longino's norms may offer a starting point to this project, with an eye to how theology may need to adapt or change these norms to better situate them in theological tradition.

The nature of theological inference

According to Judith Wolfe (2022),

> Christian theology is the systematic and critical representation, explication, examination, and elaboration of the content and form of Christian faith. It seeks to represent Christianity's statements of belief coherently, to explicate them by reference to their foundations and contexts, to examine their significance and resilience, and to elaborate them in relation to new questions and discoveries.

How communities and theologians approach these doctrinal subjects depends on their orientation within theology as an intellectual and practical structure. Whereas science aims to provide an ordered account and record of the world through empirical methods, Christian systematic theology (CST) aims at an ordered account of the Christian faith, drawing not only on reason and experience but also on revelation and tradition. Although most Christian communities accept all four of these theological sources in one sense or another, a major factor in divisions between Christian traditions is the way these sources are weighted and employed. Of course, this sort of epistemic variation across sub-contexts is also evident in science; while both biology and physics employ empiricism, there are huge differences in what each discipline counts as empirical evidence and what sorts of hypotheses they use this evidence to evaluate. It is worth noting that this social dimension of theology – the dependence of theological inference on communal norms – tends to be an explicit feature of theological inference rather than a tacit one (as is often the case in science). To put it in algorithmic terms, it is well established in theology that inferential outputs depend not only on the inferential inputs (e.g. scriptures, sources, traditions), or even the 'rules' of the faith, but also on the communities in which the inferences are run.

Like most scientific inferences, theological inference is underdetermined. Moreover, for many CST communities, there is also a problematic linguistic gap related to the empirical problem of inferential underdetermination formulated by Longino. Recall her point that in most scientific experiments the language used to describe observations is not formally related to the theoretical language of the hypothesis, forcing communities to adjudicate on the relevance of the empirical evidence to the hypothesis. A related type of formal inferential limitation occurs in any theological discussion where the language used to describe

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God is understood as analogical. To claim that God-talk is analogical is to assert that predicates, when applied to God, cannot be interpreted to mean the same thing as when they are applied to the created world. Many theologians defend the necessity of analogy when speaking of divine transcendence. For example, Kathryn Tanner (2013, 138–139) writes

> Divine transcendence is not a doctrinal affirmation in any ordinary sense but a grammatical remark about theological language: it signals a general linguistic disturbance, the failure of all predicative attribution, in language about God ... Affirmations about God, as a result, do not imply corresponding denials. Talk about God violates the Spinozistic dictum, maintained in ordinary language about things, that all determination is negation; and vice versa. In otherwords, language about God contravenes the way in ordinary speech that the affirmation of certain qualities implies the denial of others, and the denial of certain properties implies the affirmation of others.

As Tanner puts it, one consequence of using language analogically is that the logical or formal relations that are taken to exist between words in ordinary language cease to hold when those predicates apply to God. This raises trouble for systematic theology in so far as some (analogical) claims about God are supposed to imply or at least 'hang together with' other (analogical) claims about God, as well as rule out certain God-possibilities. But this sort of inferential relationship between the truth of various God-propositions cannot have a formal justification given the kind of linguistic disturbance Tanner describes. So, whereas empirical theories require communities to adjudicate on the relevance of evidence (in lieu of linguistic rules to govern such inferences,) theological claims require communal adjudication on the implication of various theological claims, since these propositions cannot be linguistically governed in the same manner as their ordinary language counterparts.

In other words, the coherence Wolfe describes as an aim of CST cannot be conceived of as merely a relationship that holds between various doctrines, but instead it is a property that emerges from the way a particular community relates to a set of doctrines; coherence is adjudicated by the community. This is strongly analogous to Longino's observation that in empirical communities the connection of data to hypothesis is often a product of social interactions rather than formal relationships between the data and evidence. Moreover, in addition to worries raised here about analogical language, theology often requires non-formal resources to determine questions like the relevance of sources or 'data' to theological claims. The analogy to empirical communities here is even more straightforward; the relevance of the data (e.g. scripture, experience, tradition, etc.) to the theological claim is generally determined through a community of knowers rather than some formal linguistic relation between the source itself and the theological claim it is taken to support.

But to recognize that theology is like science in its reliance on social processes to support various inferential links, both when evaluating the coherence of God-talk and when determining whether certain theological data supports theological claims, immediately invites worries about the normative force of theology. In the same way that science is supposed to inform and constrict how we view the world, theology is supposed to inform and constrict how we think about God. The appeal of the objective view comes from our recognition of our subjective limitations. We all experience having views about the world that turn out to be wrong; this leads to a conceptual distinction between how things are and how we believe things are. Theoretical subjects like science and theology are supposed to describe the way things are and not merely how we think things are. For some Christian theologians, perhaps, the claim is even stronger: theology is supposed to describe the world according to God rather than according to people. It is easier to maintain this narrative of theory when

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we take the boundaries and forces that hold a theory together to be external to human judgment – for example the force of inference found in a formal language. But if these inferential processes are mediated by social cognition, how can they be normative? Are they merely descriptions of what we do think rather than a guide for what we ought to think? Moreover, if it is within a communal cognition that ultimately settles theological disputes, what is to prevent this social cognition from becoming corrupted by power? What stops the powerful majority from erasing the standpoints and contributions of marginalized voices?

Longino's feminist contextual empiricism addresses these worries (insofar as they arise concerning science) by arguing knowledge-claims do increase in their objective standing (and relatedly in normative force) through the process of transformative criticism. While it is true that our subjective views are often partial and biased, critical and norm-governed dialogue – transformative criticism – improves subjective views, making them increasingly objective. In the context of science, Longino urges turning our philosophical focus away from merely logical relations that exist (or fail to exist) between data and theory and paying increased attention to the social processes that produce theory. While we may not be able to find some purely linguistic or formal path to guarantee the truth of our knowledge, some kinds of communities are more likely to produce reliable knowledge than others. On her view, being intentional about the sorts of communities we form and the norms that govern them improves the quality of knowledge and ensures its expansion – growth through the contribution and inclusion of previously marginalized voices. When people from different standpoints can interact in critical and equitable norm-governed dialogue, such conversations eradicate bias and weave together multiple perspectives into a tapestry of truth.

If we apply Longino's solution to theology, then, it follows that theological knowledge is also made objective through critical, dialogic interactions in healthy, norm-governed communities. If it is the community that ultimately determines the coherence of doctrine, it is not merely formal linguistic rules or apt exegesis that improve the quality of theological knowledge, but the growth and health of the theological community and the kinds of interactions that are had between its members. As Rowan Williams (2000, 6) writes,

> We discover who we are, in significant part, by meditating on the relations in which we already stand. We occupy a unique place in the whole network of human and other relations that makes up the world of language and culture … And this is where we may begin to talk theologically (at last). How do Christians make moral decisions? In the same way as other people. That is to say, they do not automatically have more information about moral truth in the abstract than anyone else. What is different is the relations in which they are involved, relations that shape a particular kind of reaction to their environment and each other. If you want to say that they know more than other people, this can only be true in the sense that they are involved with more than others, with a larger reality, not they have been given an extra set of instructions.

Though Williams here refers specifically to individuals making moral decisions, the picture of discernment he paints reflects both the situatedness of knowledge and Longino's suggestion that our knowledge is improved through engagement with others. Williams depicts theological sources not as 'extra sets of instructions' but mediums for broadening the theological community to include a 'larger reality' of both spiritual ancestors and the divine itself. The way Williams frames this understanding of Christian knowledge strongly resonates with the claims of social epistemology which take knowledge-production to be the function of a community and improved as the community 'improves'. What lingers, however, is the question of precisely how theological communities 'improve' or what constitutes a healthy theological community.

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Though resolving this question is beyond the scope of this article, Longino's norms offer a way to initiate the discussion. In the remaining space, I consider to what extent Longino's norms may (or may not) seem appropriate to assessing and informing the development of healthy theological communities. Again, the goal is not to force theology to adhere to the norms of science in order to be seen as a valid method of knowledge-production, but instead to offer scaffolding for theological communities to develop their own explicit set of norms for objective knowledge production.

Norms for theological knowledge production

Recall Longino's norms for healthy knowledge-producing communities. The first norm – the provision of venues in which critical interaction can take place – is already largely recognized in the production of theological knowledge. From the councils of the early church to modern conferences within denominations, as well as specifically academic meetings like the American Academy of Religion (AAR), there exist venues for critical interaction concerning questions about Christian theology. Such venues are distinct from meetings in which the community gathers for spiritual practice or worship, in the same way that scientific meetings discussing the state of the profession and current research are quite different from days spent practicing the scientific method in the lab. However, Longino emphasizes the need for these meetings to develop an atmosphere that is genuinely friendly to transformative criticism; this means the aim of the meeting must be critical reflection and openness to progress.

Longino's second norm points out the evidence of such progress is change in the beliefs of community members. If the meetings called for by the first norm promote critical dialogue, this success is evidenced by changing beliefs throughout the community. It is important that the distribution of this change is mutual; community members learn from each other and compromise for the sake of one another rather than, for example, one subset of community members forcing the rest of the community to conform to their beliefs; on Longino's view, it is precisely this kind of change in belief distribution that gives evidence the dialogue is equitable rather than oppressive. An equitable distribution of belief change across the community does not occur when one powerful group of epistemic agents forces the community to conform to their view. Moreover, such change reveals an attitude of humility and constant reflection, a commitment to continually reevaluate accepted knowledge in light of unfolding changes in history, research, and culture.

The application of this sort of norm to theological knowledge production may be met with some resistance by theologians who understand theology as a primarily historical discipline rather than a progressive one. Some Christian theologians understand revelation to be timeless; what has been revealed is eternal truth and eternal truth does not change. Some see it as appropriate to the narrative of Christianity that one subset (the elect) bring about the conformation of others to their beliefs. Relatedly, some Christians take the basis of Christianity to be the unchanging and eternal nature of God, and expect knowledge of God to be similarly atemporal. Of course, the Christian sympathetic to a narrative of theology as constructed will not find these claims particularly convincing. On a constructivist view, though God may be eternal and may reveal that eternal nature to humans, humans wrestle with revelation as it unfolds in time and construct (temporally useful) systematized interpretations within the framework of their present moment. To return to the analogy to science, changes in scientific theories over time do not necessarily imply any changes in the 'true laws of nature'. We might similarly assert that revelation does not change but the creeds, metaphors, narratives, doctrines, and so on used to understand, engage, and communicate this revelation require updating in order for truth to be properly preserved

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from generation to generation. If that's right, then Longino's suggestion that healthy communities are those which display a change of belief distribution over time may prove apt to theological discourse.

Of course, the degree of this change and what is open to change is itself a point of divergence among various Christian groups – and may be itself a discontinuity between science and theology. Concerning the epistemic norms of inquiry in science, Heather Douglas (engaging the work of both Longino and Robert Merton) writes. A general feature of the space of inquiry is the lack of procedures for debate closure regarding which claims to accept

> This norm undergirds the non-dogmatism so important to inquiry (as Merton noted). There is no such thing as permanently settled views in science or inquiry. Long-standing views widely held as obvious 'truths' have been overturned, including Euclidian space, the inherent inferiority of women or particular races, the immovability of the continents, and the non-inheritability of acquired characteristics (overturned by epigenetics). Scientific inquiry must always be open to future revisions of what appears to be settled. Epistemic communities can consider some claims, theories, or methods sufficiently well established to not warrant further debate at the moment; we cannot debate everything all the time. But no claim, theory, or method can be held permanently outside the reach of contestation or debate (2023, 137).

According to Douglas (and many others) part of what makes science a reliable form of knowledge construction is its commitment to non-dogmatism. Many theologians and practitioners of religion take incontrovertible dogma as a requisite foundation for reliable knowledge production. This may be a deep difference between epistemic norms and ideals in science and theology, and communities of theologians may decide the very practice of theology cannot exist without dogmatic absolutes. However, an infallible commitment to particular claims need not render the second norm irrelevant to theology. Even if one takes certain claims to be too central to Christian theology to be negotiated, one can affirm the discipline as a whole invites evolution over time as these core truths must be reconsidered and re-illuminated within ever changing cultural contexts. Moreover, there are interesting questions here about what it means to uphold or continue a tradition while also updating or integrating it; that is, can 'dogma' undergo some kind of scaffolding change without ceasing to be the same basic 'truth'.

Next, Longino argues the norms that regulate public discourse must be publicly accessible. I have already commented on why this is important in scientific contexts, so here I will focus on the major challenge that emerges when attempting to apply this norm to Christian theology: the nature of revealed knowledge. Christianity and many other faith-traditions allow for the possibility that some things are 'known' or 'given' to individual members of a community and not others: this is related the nature of special revelation. This highlights another significant difference between theology and strictly empirical knowledge-production. The narrative surrounding empirical knowledge is that any piece of knowledge constructed is (at least in theory) accessible to all knowledge-producing agents, allowing the knowledge discovered by one epistemic agent (or group of agents) to be confirmed by others. But within Christianity and many other forms of religious practice, knowledge may be acquired through all sorts of experiences that are not open to the public. These may range from the dramatic (e.g. visitation by angels, visions or audible voices) to quiet versions of personal intuition (e.g. a strong sense of peace).

When and how to validate reports of such experiences is a question that has received a great deal of attention within the Christian tradition, and there are various practices in different communities for how such testimonies are verified. However, insofar as the practice

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itself lacks transparency, it's important to recognize it can easily be used as a method for preserving power and furthering the oppression and domination of one group by another. Christian scripture suggests that part of the divine method for preserving equity in the community is that divine truth is often revealed to the poor, the powerless and other outsiders to the community. As Matthew 11:25 notes 'you have hidden these things from the wise and the intelligent and have revealed them to infants' (NRSVA). Moreover, Christian tradition and scripture suggest that while an individual often receives a new revelation first, it is eventually confirmed throughout the community by the same Spirit. In any case, some attention needs to be given to how theological communities might allow for the possibility of spiritual revelation while carefully attending to the prevention of colonized theological knowledge.

Furthermore, although the third norm suggests the standards of the community be publicly acknowledged, even in empirical communities most inferences are not fully externalizable; the failure to establish such inferences – one in which any person can in principle see exactly what there predecessor 'saw' when placed in the same conditions – is the starting point of Longino's account. As a result, Longino's point may still prove useful to constructing norms for theological communities insofar as it requires the members to give an account and be explicit about their individual reasons, even if there is not a single homogenized path towards the community's shared conclusion.

This brings us to the final norm, tempered equality. As previously noted, this is one of the most disputed in the philosophy of science literature and will likely meet similar controversy among theologians. However, it remains central Longino's view as it directly engages and protects against worries about the colonization of knowledge. As Douglas notes (Douglas 2023, 136), 'Part of the challenge of epistemic decolonization and of epistemic justice is working to ensure that criticisms of normal practices coming from marginalized voices within the space of inquiry get serious attention and response.' Longino argues this can only be done 'in situations where knowers are respected for their epistemic contributions and not ignored or assigned less credibility because of who they are' (Grasswick 2018). Of course, this equality is tempered because it is true some members of the community may have more of the relevant sort of expertise or cognitive ability required for any judgement. Nevertheless, this norm exists to ensure the community takes seriously the voices of new members or outsiders to the standards and practices of the community and holds itself accountable to their questions and concerns.

One of the major variants across different Christian denominations is the nature of church governance, specifically to what extent the church should be governed democratically. Longino's view favours democracy, and as a result may clash with certain models of church hierarchy and resonate with others. However, even if we leave aside the question of church governance, Longino's norm of tempered equality raises a larger concern that theological communities must wrestle with: are all voices equal in the theological community when it comes to arbitrating talk of God? What norms might theological communities generate to establish a form of epistemic justice that takes seriously the voice of the outsider, even when the outsider's questions are levelled at core practices and beliefs of the community?

In scientific contexts, tempered equality is meant to hedge against two interrelated forms of epistemic injustice. First, it protects against institutionalized bias: scientific communities tend to prioritize what has worked in the past, what people have done for a long time, and/or the voice of experts who have previously proven themselves to have valuable insight. While this sort of bias has rational roots, it can still be problematic insofar as it entrenches a certain way of doing things and can often close one's abilities to see new ideas or problems. Outsiders can often recognize these problems with clarity and ease, but if

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the community does not take their voice seriously it will miss the opportunity to improve. For this reason, it is important scientific communities are open (and accountable) to all epistemic agents. The second concern is that institutionalized science exists within social structures which are already oppressive, and the epistemic stratification that exists in those societies (i.e. privileging the voices of those with the most social power) are likely to spill into scientific hierarchies. In this sense, tempered equality actively counteracts epistemic bias that is already woven into epistemic agents from their participation in an oppressive social structure.

The need for (and importance of) some version of tempered equality in theology has been recognized by a number of theologians – and within a number of theological movements (i.e. Liberation Theology, Queer Theology, Feminist Theology, etc.). Christian theology has frequently catered to the narrative of the ruling class, and numerous movements in theology have arisen as challenges to it. Dolores Williams poignantly describes how womanist theology in particular takes on this corrective task in her preface to *Sisters in the Wilderness* (1993, xvii).

> Today a theological corrective is developing that has considerable potential for bringing black women's experience into theology so that black woman will see the need to transform the sexist character of the churches and their theology. The corrective ... is called womanist theology ... As I see it, womanist theology is a prophetic voice reminding African-American denominational churches of their mission to seek justice and voice for all their people, of which black women are the overwhelming majority in their congregations.
>
> While its aim is discourse and work with black women in the churches, it also brings black women's experience into the discourse of all Christian theology, from which it has previously been excluded.

Although Williams' conception of womanist theology prioritizes the needs and empowerment of black women, it also introduces unique challenges to the whole of Christian theology. The norm of tempered equality insists on the importance of Christian theology engaging, wrestling with, and attempting to address these critiques and questions in ways that are satisfying to the whole epistemic community (including, importantly, black women and womanist theologians).

The struggle with tempered equality, specifically in theological communities, is determining whether there ought to be any boundaries on who is included in the epistemic community. Scientific communities tend to assume that all epistemic agents ought to be considered members of the (broadly construed) empirical knowledge-producing community (thought they may need training to participate in some interactions); theological communities are a bit trickier. Theological knowledge sometimes carries with it a narrative of mystery and revelation; perhaps for some it has been given to know and others it has not. This sort of narrative makes way for communal norms that exclude questions and criticisms from those who lack the relevant 'epistemic status'. The problem with this is determining who has membership to the community, especially since membership itself is often determined by holding specific beliefs. In that case, those who don't hold those beliefs (even if for very good reason) can't engage with or question the beliefs of the community and expect to be taken seriously. This may well lead to precisely the kinds of epistemic injustice that Longino's norm of tempered equality helps avoid. As a result, theologians need to give serious consideration to how epistemic justice can be maintained within theological knowledge-producing communities.

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Objections

In this article, I have presented Helen Longino's account of how social cognition lends itself to the production of objective knowledge in scientific communities. I have further argued Longino's model of objective knowledge production – which shifts the emphasis from knowledge as a relationship between a subject and an object to a relationship between a community and the world – might be useful in offering a narrative of how theological knowledge becomes objective as well as offering scaffolding for theologians to reflect on and develop norms for objective theological knowledge production.

There are two objections one might have to this project as a whole. First, I have presumed Longino's definition of objectivity (that it is the output of a dialogic process grounded in transformative criticism) is acceptable. What if one rejects this account of objectivity? Is there any point in considering Longino's view? The short answer is: I think so. While intersubjective and social accounts of objectivity are taken seriously by many philosophers of science, it is certainly not indubitably true and there are plenty of respectable academics and philosophers of science who object to it.[2] However, even if one does not ultimately agree with Longino, introducing ideas from social epistemology into the theological community, particularly the sector of the theological community engaging with science, is useful and important fodder for conversation, and sheds light on important aspects of how science (and theology) actually happen. So, even if one does not find Longino's response to the collapse of positivism compelling, there is a need for further engagement with her ideas (critical dialogue, if you will) within the theology and science community.

The second objection is one formulated by Longino herself in her later work. That is, what if the community just cannot come to agreement? What if our differences in perspective and experience ultimately make shared knowledge impossible? (Longino's 2013) book *Studying Human Behavior: How Scientists Investigate Aggression and Sexuality* offers in-depth case studies of how different sciences approach human behavior, ultimately arguing that because these sciences carve up the causal structure of the empirical world so differently they cannot ever fully integrate. This points towards the possibility of an irreducibly pluralistic science – perhaps we just need multiple ways of looking at the world. Theologically speaking, this may be read as consonant with the points expressed by Williams in her comments on womanist theology. It may be a bit too hopeful to expect there is a single theology which can serve all populations, and dialogue will inevitably break down because experience offers us too many different starting points.

Irreducible pluralism is a live possibility in both science and theology. Nevertheless, even if it turns out we cannot – through transformative criticism – fully unify science or theology, it's still important for academic communities to be aware of and open about their internal norms. Moreover, attempting to unify different theories and having critical and open dialogue improves the insight of the interlocutors, even when it does not result in agreement. Regardless of whether theology (or science) bring about a single 'objective' theory, constructing communities whose norms generate transformative criticism will nevertheless improve the quality of knowledge produced.

Conclusion

Much of the science and theology literature is centred on defining the relationship between these two different methods of knowledge production or determining what we ought to do when they are in conflict. The goal here, however, has been to consider some insights from philosophy of science and see to what extent they may be applicable to theology.

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In particular, this article considers issues concerning scientific confirmation and one approach to reframing the classic picture of scientific inference: Longino's feminist contextual empiricism. Longino argues scientific inferences are not made objective by following particular linguistic rules but instead by adhering to norms that produce transformative criticism through constructive dialogue. Because Longino's hermeneutic focuses on the communal aspect of knowledge production in science, much of what she has to say is relevant to non-empirical communities such as theology. Nevertheless, while theology is similar to science insofar as it communally adjudicates inferences to produce knowledge, it has its own distinct sources, methods, and narratives about this knowledge which ultimately connect to what norms theologians may find appropriate. While theologians may not find Longino's norms fully extendable to knowledge production in theology, they still offer a good starting point for reflection on the importance of explicit and equitable norms for developing theological knowledge.

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Notes

1. For a more detailed history of positivism, or how it influenced the development of contemporary philosophy of science, see Creath (2023) or Okasha (2016).
2. For examples of such objections see Kitcher (2002) or Hicks (2011).

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