Probabilistic Claiming as Meta-Comparative Practice

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Introduction

1. A substantial aspect of Wilfrid Sellars' work is an attempt to understand how our conceptual schemes—our organized systems of theoretical knowledge—serve as intelligible pictures of a non-conceptual reality, a reality independent of our discursive practices. It is a question that Sellars inherited from Kant's distinction between the world of appearances and the world as it is in itself. For Kant, the latter is knowable only through a transcendental semantics beyond our reach; by contrast, Sellars naturalizes the distinction and advocates that the relation between reality and our conceptual schemes is something that we are capable of knowing about (Sellars, SM V. §67-69[1]). By way of a promissory note, the knowability of this relation is possible through natural science. Sellars—following Charles Sanders Peirce—is committed to natural science pragmatically improving upon its knowledge until its theories converge on an ideal conceptual scheme and no longer require modification (Sellars, SM V. §95). The underlying motivation is to establish ideal conceptual picturing relations that progressively replace conceptual schemes in favor of more adequate pictures of reality (Brandom, 2023).

2. However, Sellars offers only a blueprint for understanding how we should go about modifying our picture of reality toward ideal ends: we are left to build up the scaffolding for making an ideal conceptual scheme intelligible. An outstanding problematic in Sellars' account is that the

[1] Reference to Sellars follows the standard abbreviation scheme and is referenced differently than secondary sources.

manner in which conceptual schemes are compared (retrospectively and prospectively) is inexplicit. Thus, the task of this work is to suggest that probabilistic claiming plays a fundamental role in the development of ideal conceptual knowledge through its comparative and meta-comparative force. The following is a story about the important function of probability as a meta-linguistic practice, which serves as a motor for the robust comparison of conceptual schemes and learning in general.

3. In **(I.)**, I rehearse and develop Sellars' account of probability (primarily through IV and CDCM) and show how Sellarsian probability aligns with Bayesian inference. I then suggest that the basic framework of Bayesian inference serves as a useful heuristic for explicating the function of probabilistic reasoning in Sellarsian terms. In **(II.)**, I address Sellars' critique of looks-talk and reformulate his concerns to show how probabilistic knowledge underpins scientific and commonsense learning. The task of this section is to preemptively rescue probability from falling into a sophisticated kind of looks-talk. In **(III.)**, I introduce a three-fold structure of probabilistic claiming: *(a)* commonsense probabilistic claiming, *(b)* scientific probabilistic claiming, and *(c)* probabilistic meta-comparative practice that can be explicitly used for improving our conceptual scheme.

I. Sellarsian Probability & Bayesian Inference

4. The thesis to be explicated here is about the nature of probability statements. This includes everyday probability statements (*It will probably rain tonight*) and scientific probability statements (statistical arguments). I will demonstrate that probabilistic statements are pragmatic epistemological *claimings* rather than ontological *claims*: that probability is a way of justifying beliefs and commitments to concepts rather than a way of picturing reality. Probability

statements give us reasons for beliefs and are central to our learning. For one to inferentially reason from probability is to locate conceptual thought in a chain of acts that puts one in a position actively to determine whether or not to endorse a state of affairs, but without being able to actually judge it to be so.

5. Sellars takes the core of probability to be a form of practical reasoning that results in three kinds of distinct but related outcomes: proximate, practical, and terminal (Sellars, IV §24, §42, §48). Proximate outcomes instantiate practical reasoning from probability arguments and take the form: *It is probable that p*; they are justificatory. Practical outcomes, which are the result of a corresponding proximate outcome, take the form: *I shall accept that p*; they express intentions with justification. Terminal outcomes arise through successfully carrying out the intention expressed by practical outcomes, justified by the lights of the proximate outcome and made possible by the commitment involved in the practical outcome; they take the assertoric form: *p*.

6. Taken together, the three outcomes make up first-order probability arguments. They (1) tie together interactions between outcomes inferentially derived from evidence, (2) enable one to obtain justified intentions, and (3) equip one pragmatically to act on those intentions with reason. However, this does not yet tell us how probability can be used to develop inferential conceptual knowledge that furthers scientific picturing of reality.

7. In order to play a role in scientific picturing, the three outcomes must also be construed as second-order probability arguments, transposed into a subjunctive conditional tone. In particular, we must understand how statements of the form:

> It is probable that *p* implies *q*.
>
> I shall accept that *p* implies *q*.

So: *p implies q*.

range over instances of singular circumstances and become lawlike statements of the form:

p implies *q* in C *implies* that the proposition *p* would obtain in $C^{[1,2,\dots]}$.

8. We are interested in how outcomes from first-order probability arguments can become generalized into second-order inferential lawlike statements as above. Sellars offers a preliminary account to satisfy this movement. The suggestion is that an accepted framework of evidence provides the ground for our rules of inference. As in:

There is a relevant body of evidence that stands in relation to the proposition *(In all probability) p* implies *q* in C *implies* that the proposition would obtain in $C^{[1,2,\dots]}$.

So: I shall accept and am justified to accept that *p* implies *q* in any instance of C.

In my view, this does not add much to first-order probability arguments except that it makes relevant bodies of evidence—empirical reasons—explicit when endorsing an inferentially derived belief. According to Sellars (IV), we also need a transposition of the form:

(In all probability) *p implies q* is true in a finite set of examined instances (E).

So: I shall accept that *p implies q*.

to:

E is a part of a framework of evidence φ.

That E is in φ makes it probable that *p implies q* would be true in a set of unexamined φ-type instances.

> So: I shall accept a proposition which satisfies the probability condition of an unexamined φ-type instance.

Such a distinction provides the outlines of a framework in which conceptual schemes are able to be compared as lawlike statements. I will return to this in the final section of this work.

9. Sellars states:

> §62. For the end-in-view in nomological induction [...] is not the possession of empirical truth, but the realizing of a logically necessary condition of being in the very framework of explanation and prediction, i.e., being able to draw inferences concerning the unknown and give explanatory accounts of the known. This end-in-view, unlike Reichenbach's end-in-view with respect to which he attempts to vindicate nomological induction, is something which can be known to obtain (IV).

To grasp how the end-in-view of lawlike probability outcomes can be known to obtain, Sellars outlines a logical order of dependence among modes of probability: (P1) The probability of theories rests on (P2) the probability of nomological inductions, which rests on (P3) probability involved in the statistical explanation of the composition of samples in terms of the composition of the relevant finite populations to which they belong (Sellars, IV §65-66).

10. However, Sellars omits an important, higher-order dependence relation in the order of probability: the probabilistically derived comparison of theories that results in lawlike statements, which rests on (P1)–(P3). That is, Sellarsian probability requires a meta-comparative practical dimension that allows for conceptual schemes to be improved upon. The reason for this is that the explication of lawlike statements is a practical rule-governed activity that depends upon our discursive practices to be made intelligible. For, as I have articulated above, probability

gives us nothing other than a justified doxastic position in the space of reasons. Hence, it is necessary for a theory of probability to include a deontic framework to demonstrate how we should learn what to believe, when beliefs ought to be modified, and, most importantly, how to update the conceptual framework of the space of reasons itself. Without this, we risk resting the outcomes of probability arguments on a sophisticated but empty version of abstract description, which is the topic of (**II.**).

11. The main point is to draw a distinction between probabilistic description and what I call probabilistic claiming, which is practical probabilistic activity (the apex of which, I will suggest, is meta-comparative activity on the conceptual level). The distinction can be drawn straightaway: Probabilistic descriptions are abstract entities[2] generated by (statistical) inference, instantiated through correlations derived from empirical observation. These are the statistical results of, say, a particular experiment. Probabilistic claiming is contingent upon probabilistic description; by contrast, it plays a postulational role in scientific activity. By postulational role, I refer to the practice of formalizing beliefs derived from scientific practice and postulating a conceptual picture of the world through those beliefs. Recognizing the practical dimension of what one is in a position to do with probabilistic description provides one with the machinery necessary for postulating unobservable conceptual items—like physical laws—based on rational belief, eligible for further scientific examination. Without a practical dimension, probability runs the

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[2] I assume a familiarity with Sellars' account of abstract entities and point the reader to his EAE and NS. Sellars states that, "[Abstract entities] are linguistic entities. They are linguistic expressions. They are *expressions*, however, in a rarified sense, for they are distinguishable from the specific linguistic materials which (sign designs) which embody them in historically given languages […] ·red· is a type which is shared by the English word "red, the German word "*rot*" and the French word "*rouge*"" (EAE §1). Later, Sellars replaces *type* with *kinds*; in any case, abstract entities do not exist, for Sellars, in reality as it is in itself, independent of our thinking it. For, if sortals (·red·) corresponded to different objects, the sortals themselves would be different.

risk of serving our conceptual scheme a sophisticated version of the Myth of the Given: when we fail to realize that a rational theory of acceptance is produced by our practical activity, we take it for granted and believe that our practices have revealed something that we ourselves couldn't have produced: a picture of the world as it is independently of our thinking it.

12. We need to answer the question: how does probabilistic claiming play a postulational role? To answer this, we need to see probability as practical activity: probability is not something that we discover as a part of nature, but a method for tying together our beliefs to the observable world in the space of reasons. For example, when meteorologists predict a 70% chance of rain, they are not describing the weather; they are giving us reasons for belief, which inform our actions (say, bringing an umbrella with us).

This tying together is what enables our conceptual knowledge to reach lawlike ends. That there is already a formal process for this practice—Bayesian inference—makes this less philosophically demanding. Before spelling this out, it is helpful to start with a toy model.

13. Suppose we knew nothing of the behavior of water when heated. Suppose that, at some point in history, it became clear that when water was heated, we could do more with it (cook certain foods, for example). So, we continue to heat water until it begins to bubble vigorously and is too hot to touch. Then, Jones comes along and invents a thermometer that can accurately measure the temperature of water while it is placed under heat. We test and retest heating the water and find that it reliably boils at 100°C after *n* repetitions. Now we have a ground-level scientific description of the behavior of water:

> At 100°C, water boils.

or:

> Water at a temperature of 100°C *implies* that water boils (and the implication works conversely).

which is the lawlike version of the practical normative commitment:

> One should accept that water *would* boil if it *were* heated to 100°C.

14. Suppose James, a student of Jones, takes a community into the mountains, equipped with thermometers. They set up camp at an altitude of 1829m. After some time, James returns and expresses to Jones that he has discovered that:

> At 94°C, water boils.

Surprised, they both try James' thermometers in the original location of Jones' discovery and find that water only boils at 100°C. They have a number of practical options, all of which have corresponding doxastic commitments:

> Never return to the mountains and *believe that* the thermometers are broken, because in all other cases, water reliably boils at and only at 100°C.
>
> Return to the mountains, find that water reliably boils at 94°C, and *believe that* the thermometers work differently in the mountains.
>
> Return to the mountains, find that water reliably boils at 94°C, and *believe that* water behaves differently in the mountains.
>
> …etc.

That is, they apply one conceptual framework to the observable world and make corresponding commitments that influence their behavior and their picture of the behavior of water.

15. What I am illustrating here is that there is an appearance of at least three competing conceptual schemes at play in this toy model. And without filling in all of the details, it is clear that the adequate conceptual scheme is the one that updates its beliefs and corresponding commitments in light of new and sound information, thereby allowing one to change their actions and concepts. Such a picture can be formulated as the following lawlike statement:

> At time *t* and at place *p*, water reliably boils at 100°C.
>
> We, the scientific community, believed and were committed to the concept that: “water is boiling” *implies* “water is at a temperature of at least 100°C”.
>
> Then, at *t’* and *p’* (*viz.*, an altitude of 1829m), we learned that water reliably boils at 94°C.
>
> So: we believe and are committed to the concept that: there is a *φ*-type circumstance for the boiling point of water and accept that “water is boiling” *implies* •water is heated to a minimally sufficient temperature•.[3]

16. What the toy model demonstrates is that, in order for probabilistic reasoning to reach toward lawlike ends, it requires the community of reasoners to recognize that their doxastic commitments do not limit the space of reasons. Instead, the necessary constraint for using probability statements to expand upon knowledge is a commitment to explicating the space between one's prior beliefs and posteriorly available (i.e., unexamined) information, available

[3] And now we have instantiated Sellars’ dot-quotes to suggest that we have a particular *kind* of lawlike statement that can be translated into other φ-type circumstances without losing its sense. That is, we have instantiated a conceptual scheme that acts as a one-place predicate for explaining and describing material particulars. See SM (III., IV. §52-57) or deVries (2021) for a discussion of dot-quotation.

only after new evidence enters onto the scene. Without this commitment, the lawlike power of probabilistic inference cannot come to fruition and remains mere empirical description. For there is a world of conceptual difference between the statements:

> (In all probability) *x* does *y* in C.

and:

> *x* does *y* in C *implies* that •there are minimally sufficient conditions such that if *x* were in were in $C'^{('',''',\ldots)}$, it would do *y*•.

The latter statement, marked in dot-quotes, makes explicit the range of subjunctive robustness of the inferences supported by the first claim. In other words, the point of the dot-quotes that they let us generalize across changes (including improvements) in the conceptual scheme.

17. The force of probabilistic claiming is that it does not stop at correlational descriptions of single instances of observed empirical objects. The scope of the empirically observed space expands as a consequence of the process of probabilistic claiming. This positions us to progressively form a more adequate conceptual scheme of reality, while keeping the kernel of our prior view intact. Our toy theory of water expanded once we expanded the circumstances in which we performed our empirical descriptions. Posteriorly available information transposes prior doxastic commitments into iterative conceptual knowledge of a similar probabilistic reliability. Doing so positions us to make lawlike statements about unexamined future cases based on minimally sufficient conditions.

18. Now, I take it to be the case that Sellars' account of probability can be reconstructed in terms of Bayesian inference. While it is outside the scope of this work to offer a detailed account of

Bayesian probability theory, I will provide a framework of Bayesian inference that emphasizes its practical applicability for comparing conceptual frameworks[4].

19. Sprenger (2016) describes statistical inference[5] as a process of answering three primary questions:

> What should one believe?
>
> What should one do?
>
> When do data count as evidence for or against a hypothesis?

Bayesian accounts of probability focus on the first question and use the latter two as methodological equipment for establishing belief (Hájek & Hitchcock, 2016; Kaplan, 1981). They ask how and in what ways does the probability calculus inform rational beliefs. Sprenger states:

> [Bayesian accounts] interpret probability as rational degree of belief. That is, an agent's system of degrees of belief is represented by a probability function $p(\cdot)$, and $p(H)$ quantifies his or her degree of belief that hypothesis H is true. *These degrees of belief can be changed in the light of incoming information.* The degree of belief

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[4] For an accessible overview of Bayesian and Frequentist inference in probability theory, I refer the reader to the introduction of Bernardo & Smith (2000) *Bayesian Theory* and Sprenger (2016) *Bayesianism vs. Frequentism in Statistical Inference*. See references below for citation details.

[5] I use the term inference with various adjectives (viz. statistical, probabilistic, commonsense, etc.) by matter of convention. I think that it is in some sense important to collapse the distinctions superficially in order to elaborate what is essential to inference in general: learning from experience and rationally updating beliefs. I, following de Finetti and others, prefer to use the terms *probability calculus* for what is now referred to as *statistics* or *statistical inference*.

> in hypothesis *H* after learning evidence *E* is expressed by the conditional probability of *H* given *E, p(H|E)* (p. 384; emphasis added).

20. But how should beliefs be changed in light of new information? On the Bayesian picture, the basic idea is that prior beliefs are systematically made explicit. For example,

> Given that every instance of *x* has done *y* in *C*, it is reasonable to believe that *x'* will do *y* in *C'* (and in all C-type circumstances).

This is our so-called prior. But in our toy model, we saw that the difference between our prior and posterior concept resulted in:

> *x* does *y* in C *implies* that •there are minimally sufficient conditions such that if *x* were in were in $C'^{('\ldots)}$, it would do *y*•

We were then able to change our doxastic commitment toward our theory of water depending on the context of its boiling without losing the basic aspects of our concept. This is our so-called posterior. In effect, we have learned something new about the behavior of water and are entitled to improve one part of our world-picture. The most important point to note here is that our doxastic commitments are always based on something prior. de Finetti (1970/2014) states:

> [Inductive reasoning] reveals how it is that one 'learns from experience', and this is true, up to a point. It must be made clear, however, that experience can never create an opinion out of nothing. It simply provides the key to modifying an already existing opinion in light of the new situation. The complex *A* (the experience) by itself determines nothing, nor does it provide bounds: to reach a conclusion—that is to determine a new ('posterior') opinion *P*—we require the conjunction of *A* with *P0* (the initial, or 'prior' opinion)." [And this is not about abandoning priors, as] On

> the contrary, the adoption of *P* in the new state of information is the only way of remaining consistent with what was adopted as the initial opinion in the initial state of information (Section 11.2.3).

So, we retain part of the conceptual scheme we started out with but improve upon it in light of new information.

21. Bayesian inference formulates doxastic attitudes through the ratio of prior and posterior likelihood odds between a set of counterfactual hypotheses, conditional on data *D*. Bayesian probability is interested and invested in the credibility of a hypothesis given a body of evidence. Specifically, Bayes' Theorem:

$$P(H \mid D) = P(D \mid H) \cdot P(H)/P(D)$$

(where *H* is a hypothesis, *P* is probability, and *D* is data) is a rational representation of subjective degrees of belief in terms of probabilities (Bernardo & Smith, 2000; de Finetti, 1970/2014; Sprenger, 2016). Bernardo & Smith (2000) state:

> With *P(H)* regarded as a probabilistic statement of belief about *H* before obtaining data *D*, the left-hand side *P(H|D)* becomes a probabilistic statement of belief about *H* after obtaining *D*. Having specified *P(D|H)* and *P*(*D*) the theorem provides a solution to the problem of how to learn from data (p. 2).

And Sprenger (2016):

> From the perspective of Bayes' Theorem, all that is needed to update a prior to a posterior is the likelihood of *H* and ¬*H* given the observed data. In a statistical

> inference problem, this corresponds to the probability of the data *x* under various values of the unknown parameter θ (p. 385).

22. In effect, by doing Bayesian inference, we are already in the business of improving our conceptual scheme. Our inferential meta-comparative practice allows us to improve upon our conceptual picture in two ways: (1) through learning the minimally sufficient conditions for a theory to obtain; (2) through being committed to postulating new aspects of our original theory in light of new information[6]. Moreover, meta-comparative probabilistic practice, when put into Bayesian terms, can be translated into subjunctively robust distributive singular terms expressing rule-governed functional classifications (hence, can be construed in dot-quotes). That is, if we can construe, as Sellars does,

> "rot" in German is a •red•[7]

then:

> (In all probability) *x* does *y* in *C*
>
> *x* would do *y* if it were in *C implies* •there is a minimally sufficient condition for *x* doing *y* in *C*-type circumstances•, based upon $P(D|\mathrm{H})$

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[6] An upshot to the Bayesian model of inference is that we do not have to worry ourselves with how theories should converge. So, rather than worrying about competing conceptual frameworks, we have a single conceptual framework where the minimally sufficient aspects for it to obtain—what is dot-quoted—can be improved upon. That is, theories do not stand in relation to other theories; we work with a conceptual model and, in good scientific practice, make it more ideal. This idea is made explicit in **(III.).**

[7] Again, refer to SM (III., IV. §52-57) for a discussion of dot-quotes. Briefly: what falls between dot-quotes are distributive singular terms that apply to all the terms that play the same role in every possible language and express functional classifications. E.g., •red• plays the same role as *red* in English, *rot* in German, *rouge* in French, etc. What I am suggesting here is that the likelihood ratio of a probability argument that comes from comparing prior and posterior information can serve as a distributable singular term.

which now permits:

> I shall accept the theory that *x* would do *y* in any C-type circumstance.

the first-personal normative version of the lawlike statement:

> There is a theory such that if *x* is in any C-type circumstance, it would do *y*.

So, in the game of giving and asking for reasons, Bayesian inference provides a statistically justified reason that positions one (or a community) to rationally reconstruct theory in light of new information.

23. That this is sufficient material for comparing the probability of theories is clear by:

> There is a new language and we have learned that its expression *zed* is a •red•

That is, "…" is a •---•. Hence, for the comparison of conceptual schemes:

> There is a posterior theory (T') that adds information to the minimally sufficient condition for our prior theory (T) to obtain.
>
> So, I shall accept that the minimally sufficient conditions of T' ought to replace those of T as a more adequate theory.

which takes the same form as the empty equation for the new color-word just mentioned.

24. This procedure replaces empirical descriptions with generalizable lawlike forms. We are now in a position to imagine how conceptual knowledge can be probabilistically improved upon in a robust manner. Before seeing how this is so, it is important to alleviate a concern about probability that Sellars does not address.

II. Probability Statements & Looks-talk

25. In EPM (§12-21), Sellars diagnoses a particular mode of description that is characteristic of the Myth of the Given: looks-talk. Looks-talk is a kind of descriptive report that allows one to withhold endorsement of their claims. For example,

> Its looking to one that *x*, over there, is red.
>
> Its looking to one as though there were a red *x* over there.

Such expressions merely describe a possible experience of persons and do not require a commitment to the belief actually being the case. Instead, looks-talk separates the fact of there being a red *x* from one experiencing a red *x*. In fact, Sellars explains that the second claim outright rejects the claim that there is a red *x* over there. The alternative to looks-talk are expressions like:

> Seeing that *x*, over there, is red.

or simply

> *x* is red.

The difference is that only the alternative is able to be used in reporting roles in the space of reasons. The reason for this is that *being red*, for Sellars, is logically prior to *looking red* (EPM §14, §16, §18). For to have an experience of a red *x* is indistinguishable from actually seeing that *x*, over there, is red.

26. McDowell (1996) says:

> [Sellars' account of looks-talk] makes the authority of an observational judgment that something is green turn on the subject's knowledge that her own report "This is green" is reliably correlated, in the right conditions, with something's being

> green. But once the impression of green is in view, it can figure in a parallel grounding, in a position corresponding to that of the report in the kind of grounding Sellars envisages (p. 144, footnote 19).

That is, when one says and means that things are thus and so, one's thoughts and meanings don't stop short of the fact that things are thus and so. In breaking off the commitment to things being thus and so, looks-talk doesn't really express anything at all. For if one sees that *x* is red but is unwilling to commit themselves to it actually being so (that is, believing it), then their report cannot be about reality. Instead, it would have to be taken as a report about something like a private impression of something red without really believing the thought. Looks-talk does not play a reporting role in the business of describing and explaining the world: it cannot justify conceptual content in a normative space of reasons.

27. Now, it should be seen straightaway that there is only a precarious difference between the following two statements:

> (In all probability) if any *x* were in *y* it would be red.

and

> Its looking to one as though *x*, over there, were red.

This becomes clear when the former is written in everyday language:

> *x* is probably red [in *y*].

This can be expressed through Sellars' own example in EPM. If Jim were color-blind and asks John, the necktie salesman, what color a certain tie is and John responds:

> In all probability, it is red (or the everyday expression: it is probably red).

one would think: well, is it or isn't it red?

28. We are faced with the question: if Sellars denies that looks-talk plays a reporting or claiming role for failing to endorse things being thus and so in the space of reasons, how is it possible that, for Sellars, probability statements express reasons for committing ourselves to beliefs?

29. To answer this, we need to follow a detour to demonstrate that all learning is probabilistic. It will be shown that probability statements express endorsements to things being a certain way, but only when framed as a practical epistemological action, rather than an ontological description.

30. Our case example for rescuing probability statements from lapsing into looks-talk will be the ways in which children learn how to participate in language-games. A child learns how to discriminate colors with color-words by assimilating those expressions into a framework they have already mastered (say, primitive linguistic expressions and visual coordination). But the child only becomes able to participate in language-games—participate in a normative space of reasons—insofar as they accommodate part of their framework for the broader framework of (sensible) language (Piaget 1954/2000). Assimilating color-words to primitive linguistic expressions and visual coordination gives the child a mere *manner of speech* whereas accommodating the language of others gives the child a *manner of expression*. That is, both assimilation and accommodation put the child into a shared space of reasons with other language users. That is to say that the successful participation in the color-word game requires assimilation and accommodation in order to avoid being a kind of looks-talk. Sellars states:

> […] the ability to teach a child the colour-shape language game seems to imply the existence of cues which systematically correspond […] to the colour and shape attribute families, and are also causally connected with combinations of variously

> coloured and shaped objects in various circumstances of perception (SM, I., IV. §47).

The power of the game rests on the child's ability to pick out material particulars (such as a red toy) and develop intelligible intersubjective conceptual schemes about them. It is patently *not* about being equipped to describe representations, inner speech, or mental states. As Wittgenstein (1953/2002) says:

> §180. *This is how these words are used*. It would be quite misleading, in this last case, for instance, to call the words a "description of a mental state". —One might rather call them a "signal"; and we judge whether it was rightly employed by what he goes on to do (p. 62[e]).

31. So, it can be said that a child who has learned to say:

> I want the red toy over there.

is committed to there actually being a red toy over there. The child has not learned to say:

> I think that there is a red toy over there and I want it.
>
> So: I want what looks to be, over there, a red toy.

The child has a conceptual scheme that they apply to material particulars and is able to form expressive communicative statements with others. They have derived this conceptual scheme in a twofold manner: (1) they have normatively mastered how to use color-words, and (2) they actually take there to be (through practical acts like seeing, wanting, etc.) things with which those words, in all probability, correspond. What the child is able to do is to instantiate practical outcomes through committing themselves to the inductive inference they employ when making the expression.

32. The child, through assimilation and accommodation, has mastered first-order probability arguments:

> It is probable that there is a red toy over there that I want.
>
> I shall accept that there is a red toy over there that I want.
>
> I bring about acts which satisfy my acquiring the red toy.

and is now in a position to commit themselves to the lawlike thought that if there were a minimally sufficient condition for a red toy over there (say, tomorrow), then they would want it in the same way.

33. The purpose of introducing intellectual development in childhood is to point out that the first-order probability arguments get truncated into the endorsement of things being thus and so in everyday language. For, it is always possible that a shadow was cast on a white toy which made it look red. The child, however, was not committed to this possibility and instead made a propositional expression with all of the components necessary for it to be a lawlike statement:

> No, there isn't a red toy over there, but a white one. The shadow made it look red.
>
> Well, if there *were* a red toy over there, then I *would have* wanted it.

The conceptual scheme has not been replaced. It has been improved upon without failing to make a commitment to things actually being as they are experienced.

34. On this picture, all conceptual knowledge can be said to be probabilistic: there are particular frameworks where the propositional application of corresponding conceptual terms *would* obtain, without being materially necessary (i.e., someone could be wrong). Similarly, probability statements—framed as ground-level epistemological practical tools—can avoid being a kind of looks-talk insofar as the commitments to the relation between the framework and the

corresponding conceptual terms is made explicit. Having mastered the framework in which statements (*x* is red) can be propositional makes it no longer necessary to qualify claims with the probability token (*in all probability…*). We simply know when to apply a particular portion of our conceptual scheme, in spite of the fact that it could be a misapplication (i.e., that we could be mistaken). This is the reason that to say—in commonsense contexts like asking for toys and playing the color language-game—that such-and-such is *probably* the case withholds a commitment to it actually being so.

35. We can now see that first-order probability statements do not necessarily fall into looks-talk and can be transposed into second-order probability statements once a particular framework is mastered. It is time to address how probability statements in scientific language-games do not fail to make an endorsement.

36. The reason for rendering Sellars' account of probability in Bayesian terms is that, on such a picture, one is explicitly committed to their prior beliefs and acts accordingly. We have an original theory and are committed to its being the case; we are likewise committed to improving upon it in light of new evidence but do not fail to endorse our prior beliefs. In fact, our commitment to those prior beliefs make improving the framework possible. But unless that process is explicitly part of the inductive framework of probability argumentation then the only outcome is a kind of empirically descriptive but empty looks-talk. If our scientific aim is a conclusion of the form:

> There is a significant probability of *x* being *y* in C ($p < 0.005$)[8]
>
> So, (in all probability) *x* is *y* in C.

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[8] Where $p<0.005$ stands for the likelihood that the observation was non-random.

then all we can do is evaluate hypotheses in a descriptive manner, but without committing ourselves to the likelihood of something being the case. By limiting the aim of scientific probability to mere description, we cannot transpose first-order probability into second-order probability. For to reject or accept a hypothesis, in light of relevant evidence, is nothing other than stating:

> Its looking to one as though (in all probability) there were a red *x* over there.

which we cannot *do* anything with, as we are not committed to *x* being red over there. All that we have done is described a kind of formal experience (say, what has occurred in a particular behavioral experiment).

37. I indicated above that the line separating probability statements from looks-talk is precarious. That this is so results from a misunderstanding of what probability statements express. The misunderstanding is that statements like:

> There is a significant probability of *x* being *y* in C ($p < 0.005$)
>
> So, (in all probability) *x* is *y* in C.

do not say:

> $p < 0.005$ *means* (in all probability) *x* is *y* in C

but rather:

> There is a minimally sufficient reason (or set of reasons) that *implies* that *x* would be *y* in all C-type circumstances

and that, taken together, we are committed to the minimally sufficient reason changing in light of newly available evidence, but nevertheless endorse it as an adequate conceptual scheme for a particular theory. That is, we cannot accept an outcome from a probability argument as expressing how things stand. Rather, probability arguments express implication relations between a framework of minimally sufficient conditions and the possibility of lawlike statements. Just as:

> Its looking to one as though *x*, over there, were red

expresses nothing, we must guard ourselves against believing that probability arguments express anything more than reasons for belief, but reasons to which we are committed to explicating through testing, re-testing, and improving upon.

38. Probability lapses into looks-talk as a result of a tendency to accept the outcomes of probability arguments as conclusive evidence for or against an hypothesis; i.e., as in itself a given picturing relation. I have been suggesting that this is unacceptable, as probability statements only provide grounds for belief. The alternative that I am recommending is to recognize how probability statements produce recursive outcomes, through which we are practically equipped to improve upon our conceptual scheme. So, to rescue probability arguments from looks-talk, we must bear in mind that our knowledge cannot stop with outcomes of probability arguments. It is to recognize that there is no empirically descriptive score to be settled by probabilistic inference and that to accept a probabilistic statement as a picture of the world is to accept an empty picture.

III. Probabilistic Claiming as Meta-Comparative Practice

39. So far, I have offered an account of Sellarsian probability in Bayesian terms. The purpose of this was to show that our probabilistic statements can be construed in terms of a commitment to modifying our prior beliefs with posterior information, and that there is already a statistical

methodology in place to make this straightforward. Then, I showed that there is a risk of probability statements turning into empty empirical descriptions. To avoid this, I showed that probabilistic reasoning underpins learning in general, which gives us a way of committing ourselves to outcomes from probability statements while remaining open to conceptual improvement. The remaining task is to see how probabilistic claiming—the highest form in the logical order of probability statements—is capable of being put into meta-comparative practice for the evaluation of competing conceptual schemes. In order to do so, I will introduce a three-fold structure of probabilistic claiming: *(a)* commonsense claiming and asserting, *(b)* scientific claiming and asserting, and *(c)* meta-comparative probabilistic claiming.

40. I have been tacitly suggesting that probabilistic claiming is a kind of recursive learning that underpins all conceptual knowledge. Made explicit, I suggest that without recognizing that knowledge—commonsense and scientific—is a result of probabilistic recursive learning, then it is not possible to see how the comparison of conceptual schemes for improving our world-picture is possible. The consequence of this commitment is that the idea of having multiple, competing conceptual schemes becomes unintelligible: on the picture I am suggesting, all of our conceptual knowledge is based upon prior beliefs that come into contact with a conceptually-structured world that exists independently of our knowing it.

41. Commonsense claiming and asserting is the first practice of leveraging past beliefs toward improving our grasp of how things are. This mode of probability was outlined above through the case of intellectual development. The important result of that discussion was understanding how we truncate probability tokens in everyday language, as a result of mastering a normative framework for expressing ourselves with others where it is possible reliably to report on the world in a commonsense manner. Hence, withholding commitments is no longer necessary and

strikes us as odd. I showed that, in order to master the normative framework, one must already be capable of using first-order probability arguments in a way that, in everyday language, turn into second-order probability arguments through acting upon our commitments and being able to justify them, even in cases where we may be speaking subjunctively. For example:

> If it were later, I would be tired.

where what is truncated here is the probability token:

> If it were later, I would (in all probability) be tired (for all of the typical reasons one becomes tired later in the day, based on my prior beliefs about tiredness).

In this way, commonsense claiming and asserting can be put as a kind of folk approach to building up a normative framework of reasons, where we use prior beliefs to make reliable predictions about the future. The important point is to recognize that we are able to apply commonsense claiming and asserting if and only if we already understand the types of frameworks in which our statements obtain[9].

42. Scientific claiming and asserting follows from commonsense claiming and asserting. It is the practice of formalizing prior beliefs about the world into a systematic framework for explication. It is a step in the logical order of probability toward improving our conceptual picture in that it utilizes (statistical) probabilistic inference to test beliefs and provide ground-level descriptive accounts of material particulars. Scientific claiming and asserting should be thought of as a kind of basic research, though a basic research whose task is to robustly outline the space of reasons.

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[9] While playing chess and thinking-out-loud, for example, we would not think: *our opponent is going to score a goal by kicking the ball past the goalkeeper*. Such a prediction would not fall into the proper framework for our commonsense claiming and asserting, so we would not have good prior reasons for believing that such a prediction would obtain.

This differs from what is typically referred to as basic research, as its practical foundation needs to be framed as providing reasons for belief rather than explaining and describing how things are.

Of course, part of providing reasons for belief involves explaining and describing how things are, but without a commitment to improving upon those reasons, scientific claiming and asserting stops short of its task and turns into looks-talk. We saw this in our toy model of the boiling point of water. Had the account that reliably argued

“water is boiling” *implies* “water is at a temperature of at least 100°C”

stopped there, it would have remained inadequate in its partiality. Instead, we realized that it was necessary to put the implication into a dot-quotable form and emphasize the minimally sufficient condition for the proposition to obtain:

“water is boiling” *implies* •minimally sufficient conditions have been met•

which is able to be transposed into a subjunctive tone:

“(…)” *implies* •if minimally sufficient conditions were met•, then (…) would obtain.[10]

The important point is that the minimally sufficient conditions serve as a definitional promissory note that permits us to drop probability tokens. We no longer need to withhold a commitment to those minimally sufficient conditions, as we are committed to the improvement of a definitional framework for a particular concept. There can be new facets of the definitional framework that provide reasons for changing our beliefs without lapsing into looks-talk.

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[10] Again: the point of the dot-quotes that they let us generalize across changes in the conceptual scheme.

43. Meta-comparative probabilistic claiming follows from scientific claiming and asserting. It is the practice of leveraging knowledge derived from correlational observation (through, for example, statistical models) in order to make postulational conceptual statements about the world. For example, a meta-analysis of neural correlates for color perception in adult humans surveys the available scientific claims and aims to provide a holistic definitional conceptual framework of the relation between the brain and color perception. Hence, the findings of the meta-analysis provide not only reasons for belief but a theory of color perception that should be able to stand on its own. That this is already an established scientific practice removes much of the philosophical weight in understanding the role of probability in improving our conceptual schemes.

44. However, there is an outstanding problem that relates to Sellars' inexplicit vision of comparing conceptual schemes toward ideal ends. There is an idea—in Sellars and scientific practice generally—that conceptual schemes are in competition; the idea is that we will eventually discard the inadequate conceptual schemes in favor of the better picture. But this idea is deeply mistaken. Instead, I suggest that we are only ever in possession of a single conceptual scheme that has a two-sided structure. On the one side, there are all of our prior beliefs which have been normatively validated through scientific practice; we have followed particular methodological patterns which have entitled us to a position in the space of reasons. On the other side, there is the possibility that our picture is inadequate and could be challenged by posteriorly available evidence. There is a sceptical danger between these two sides: if we have good reasons for our doxastic commitments, then we should endorse them; but if we know—as is commonplace in the history of science—that our conceptual picture might need to change, then why should we make the commitment to the current picture we have?

But the danger is unnecessary: it comes from the mistaken idea that there are numerous conceptual schemes. In §40, I stated that the idea of having multiple, competing conceptual schemes is unintelligible. I also stated in the introduction that the way to practically compare competing schemes is not elaborated in Sellars' account and that our task is to recognize a method for doing so.

45. The solution to the mistake comes from recognizing that our prior commitments entitle us to make sense of posteriorly available information. Without them, we would not be in a position to improve the scientific endeavor. That is, our conceptual scheme is holistically singular and develops historically through our normative practices. So, rather than concern ourselves with how to make sense of the convergence of conceptual schemes, we should make explicit the fact that our conceptual scheme is always converging. And its convergence can be formally explicated through the machinery of Bayesian inference.

46. In our toy model, it was clear that what changed was not the behavior of water but the minimally sufficient conditions we used to describe it. But in order to provide a robust expansion of those conditions, it was necessary to recognize that both Jones and James were committed to the same prior subjunctive belief: that x does y in C and would do y in any C-type circumstances.

Now, we can ask: did they need to compare two competing conceptual schemes to improve upon their world-picture? And it should be clear that the answer is no. For, if their conceptual schemes were in comparative competition, then it would be nonsense to say that they had the same prior subjunctive belief. Instead, they shared a prior conceptual commitment and leveraged it to expand their theory of boiling water. So, what changed was not the physical behavior of water when heated (statements of which would be looks-talk), but the conceptual knowledge about what kinds of *C*-type circumstances must be present for the minimally sufficient conditions to obtain.

47. What I am suggesting is that probabilistic statements of all three types need to be epistemically modest. Likewise, it must be clear that there is only a single conceptual scheme at play: we have a set of formalized prior beliefs that entitles us to ask further questions; doing so could result in posterior information requiring us to modify our beliefs. The terminal outcome of meta-comparative probabilistic claiming is to provide a definitional framework for minimally sufficient reasons for knowing that our propositions would obtain. But it just might turn out—and often has in the history of science—that our prior definitional framework becomes inadequate in light of new information. If we are not epistemically modest, our implication relations regress into statements that we cannot be committed to.

48. That this seems to be backwards—that by arguing for epistemic modesty and committing ourselves to the possibility of new reasons for beliefs or entirely new beliefs instead of orthodox hypothesis testing—stems from a temptation, common in empirical science and dormant in scientific philosophy, to believe that our definitional frameworks, which are nothing other than methodological practices, are themselves pictures of the world. In other words, we must draw attention to the arrogant scepticism of believing that what we do in basic research is describe and explain the world, full stop. Without epistemic modesty, we confine ourselves to a descriptive picture of the way things, over there, look to be.

49. On the epistemic modesty account of probability I have introduced, it is possible to now see that these two claims are related. The problem with probabilistic statements based on correlations in empirical science is that, unless explicitly made to serve as promissory notes for more

adequate conceptual knowledge, we are left with an empty picture without committing ourselves to it. Then, we find ourselves with beliefs that seem at odds with those of others: we believe that we have different conceptual schemes. But this belief is not necessary. In fact, it prevents a way out of probabilistic looks-talk.

50. So, the commitments we make from probabilistic claiming should be placed in the minimally sufficient conditions that would make it the case that our propositions would obtain.

51. So, our practical use of probabilistic claiming should be recognized to be a robust method of understanding if and to what extent we must modify the minimally sufficient conditions for the probabilistic conceptual scheme we are committed to. We must learn, through experiencing the flexibility of our prior commitments in light of new information, how to retain—rather than replace— the core of our world-picture. This gives us a method for both retrospectively and prospectively understanding how new conceptual knowledge should be integrated into our commitments.

52. So, we must be committed to an epistemic modesty. For doing so will make the prior and posterior integration of our shared commitments to concepts possible.

References

Bernardo, J. M., & Smith, A. F. (2009). *Bayesian theory*. John Wiley & Sons.

Brandom, R.B. (2023). *Sellars as Metaphysician: Norms and nature, appearance and reality*. Fall 2023 Seminar (PHIL2410). Department of Philosophy, University of Pittsburgh. Pittsburgh, PA, USA. [notes and recordings available: https://sites.pitt.edu/~rbrandom/Courses/2023%20Sellars/SM%202023%20Main%20n.html]

de Finetti, B. (2017). *Theory of probability: A critical introductory treatment*. John Wiley & Sons.

deVries, W. (2021). Wilfrid Sellars. Retrieved from The Stanford Encyclopedia of Philosophy. URL: https://plato.stanford.edu/archives/fall2021/entries/sellars/

Hájek, A., & Hitchcock, C. (2016). The Oxford handbook of probability and philosophy. Oxford University Press.

Kaplan, M. (1981). A Bayesian theory of rational acceptance. The Journal of Philosophy, 78(6), 305-330. https://doi.org/10.2307/2026127

Piaget, J. (2013). *The construction of reality in the child* (Vol. 82). Routledge.

Sellars, W. (1958). [CDCM] Counterfactuals, dispositions, and the causal modalities. In H. Feigl, M. Scriven, and G. Maxwell (Eds.), *Minnesota Studies in the Philosophy of Science, Vol. II: Concepts, Theories, and the Mind-Body Problem*. University of Minnesota Press.

Sellars, W. (1997). [EPM] *Empiricism and the Philosophy of Mind*. Harvard University Press.

Sellars, W. (1964). [IV] Induction as vindication. *Philosophy of Science*, 31(3), 197-231. https://doi.org/10.1086/288004

Sellars, W. (1967/1992). [SM] *Science and metaphysics: Variations on Kantian themes.* Ridgeview Publishing Company.

Sprenger, J. (2016). Bayesianism vs. frequentism in statistical inference. In A. Hájek & C. Hitchcock (Eds.), *The Oxford handbook of probability and philosophy* (pp. 382-406). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199607617.013.23

Wittgenstein, L. (2002). *Philosophical investigations* (G.E.M. Anscombe, Trans.) (3rd ed.). Blackwell Publishing. (Original work published 1953).