



# Pluralism in reasoning: how to legitimate material inferences

Jouni-Matti Kuukkanen<sup>1</sup> 

Received: 21 October 2022 / Accepted: 27 July 2023 / Published online: 21 August 2023  
© The Author(s) 2023

## Abstract

Wilfrid Sellars's suggestion that there are valid material inferences entails that validity is not limited to formal inferences. Because material inferences are expressed in ordinary language and deal with both conceptual and empirical matters, an interesting prospect unfolds: valid reasoning is irreducibly plural. However, it is not clear what the validity of inferences composed of non-logical and descriptive vocabulary means. I argue that it is better to speak of the legitimacy rather than the validity of material inferences. A material inference can be understood as legitimate when one has a pragmatic propriety to infer from an assertion A to an assertion B. Pragmatic propriety designates the social-normative entitlement of inferencing. Because pragmatic proprieties are discipline-specific and local, legitimate reasoning is plural. Nevertheless, the shared general feature of reasoning practices is to preserve and improve the coherence of one's system of belief.

**Keywords** Material inference · Validity · Wilfrid Sellars · Robert Brandom · Pragmatic propriety · Reasoning

## 1 Introduction

Wilfrid Sellars suggested that in addition to formal validity there is also material validity: the inference “‘it is raining, therefore the streets will be wet’ might well be as it stands a *valid argument*, though warranted by *material* principle of inference” (Sellars, 2007 [IM],<sup>1</sup> p. 4). It is characteristic of material inferences that they are expressed in non-logical language and that they are irreducible to logical principles.<sup>2</sup>

<sup>1</sup> This is published in Sellars (2007), pp. 3–28. For clarity, I will refer to this paper as ‘IM’.

<sup>2</sup> It is worth noting right at the outset that material inference is not the same as a technical notion of material implication in logic. I thank Hasok Chang for his suggestion to add this clarification here.

✉ Jouni-Matti Kuukkanen  
jouni-matti.kuukkanen@oulu.fi

<sup>1</sup> Professor in Philosophy, Research Director of Eudaimonia Institute, University of Oulu, 90014 Oulu, Finland

However, because validity is so deeply associated with formal validity, it is somewhat problematic to speak of validity in the case of material inferences.<sup>3</sup>

In this paper, I provide answers to three questions: What exactly does it mean to say that material inferences are *valid*? What is this (alternative) kind of validity? Further and more specifically, where does its rational authoritativeness stem from? I suggest that material inference is an important notion, in particular to anyone leaning towards pragmatism. Its significance for those not so inclined but interested in reasoning and inferential practice in general lies in the fact that material inference potentially provides an alternative form of rationality (to formal logic and deductive reasoning) that is rooted in both ordinary and scientific practices. Further, because practices diverge depending on their respective disciplines and other cognitive formations, the consequence is pluralism in reasoning: there may be multiple, perhaps innumerable, legitimate reasoning practices.

I will firstly define, in Sect. 1, material inference by three concepts: non-enthymemic, non-logical and non-monotonic. This definitional section is followed, in Sect. 2, by an expanded discussion of the nature of material inference through the prism of three other notions: (in)validity, (in)dispensability and (ir)reducibility. The main premise that will be evaluated in this section is that the validity of material inference is comparable to formal validity, and therefore, that validity is explainable by some implicit fundamental principles. In Sect. 3, it is first concluded that material inference is not valid, strictly speaking, because most naturally validity means deductive validity, according to which the truth of the premises guarantees the truth of the conclusion. This is not the case with material inference. Therefore, it will be more appropriate to think that material inference is a non-valid yet legitimate and rationally authoritative form of reasoning. Section 4 is devoted to defining the key concept of *pragmatic propriety*.<sup>4</sup> Pragmatic propriety designates the social-normative entitlement of inferencing, which renders an inference legitimate or illegitimate. It appears, as discussed in Sect. 5, that there are many field-specific forms of reasoning and that pragmatic proprieties are different in different fields, but such reasoning aims to maintain and improve the coherence of one's system of belief nonetheless. Section 6 argues that Brandom's approach to the goodness of inference is not entirely consistent in terms of pragmatism because of its objectivist-representational grounding, which transcends communal judgment. Pragmatism requires that the judgments of a community are sufficient to distinguish legitimate from illegitimate inferences.

<sup>3</sup> The expression "material validity" is being frequently used (e.g. Brigandt, 2010, p. 42; Dabay, 2017, p.168; Koreň, 2021, p. 16; Marabini and Moretti, 2017; Macfarlane, 2010, p. 81; Peregrin 2014, p. 42; Osta Vélez, 2020), including the secondary literature about Sellars (deVries, 2014; O'Shea, 2007). More generally, reasoning and thinking are often said to be valid in ordinary discourse even when they are not, at least prima facie, expressed in any formal mode.

<sup>4</sup> This term is mine although the thought behind it draws on Brandom's philosophy. Brandom (1994) writes about 'the proprieties of practice' (e.g. p. 77), 'practical proprieties' (e.g. pp. 89, 142), the 'proprieties of inferential moves' (e.g. p. 89) and 'inferential proprieties' (e.g. pp. 206, 231), but not about 'pragmatic proprieties'.

## 2 What is material inference?

The first mention of material inference in the public record is in Wilfrid Sellars's paper "Inference and Meaning" from 1953. Sellars's discussion seems to be inspired to a large extent by Rudolf Carnap's (1937) *Logical Syntax of Language* in which Carnap studies logical and extra-logical rules of inference, suggesting in effect that material (extra-logical or physical) rules are dispensable and are not genuinely valid by and as themselves. Sellars insists that there are genuine inferences whose validity depends on the non-logical content. Material inference appears to be a particularly important issue for Sellars in his papers of the 1940s and 1950s, but he returns to it very late in his career in the early 1980s.<sup>5</sup>

Sellars's discussion and ultimately his defense of material inferences is inherently linked with his pragmatism: the defense of social praxis as something that roots our reasoning and warrants linguistic inferences. Not much has been written about material inference in general, although Robert Brandom is the most notable exception. He has made it a cornerstone of his philosophy, and therefore, one would expect it to be of great interest to many in the profession. In any case, the potential of material inference as an alternative kind of *rationally authoritative inference* has neither been properly analyzed nor fully understood.<sup>6</sup> Yet more importantly, the value of material inference as an explanation for *pluralism in reasoning* has not been adequately spelled out either.

Those defending material inference typically suggest that material inference is as valid as formal inference. While this may not be quite correct, the central sticking point is the question whether material inference is a rationally legitimate inference that stands on its own feet without a need to rely on other logical or extra-logical principles.

There are then three key features used to characterize material inference. Material inference

- (a) is non-enthymemic;
- (b) depends on non-logical vocabulary for validity;
- (c) is non-monotonic.

The first two features are suggested by Sellars in his "Inference and Meaning." The third is put forward by Brandom. Let us discuss each briefly.

- (a) That material inference is non-enthymemic means that it is a complete inference whose validity does not hinge on an addition or an explication of a hidden clause. This goes against classical logic. According to it, material inference is either incomplete or invalid. Let us consider an example by Sellars. Traditionally, in logic, the expression

"It is raining, therefore the streets will be wet"

<sup>5</sup> DeVries remarks that there is an interesting difference regarding Sellars's treatment of material inference in the 1940s and 1950s, and in the 1980s. While initially its function was to forge a link between behavior uniformity and reason-guided action, later it represented a gap between the two (2014, p. 301n24).

<sup>6</sup> Dabay, 2017 even writes that Brandom's "refusal to return to the topic of material inference for any extended period leaves the connection between pragmatics and material inference murky at best, and nonexistent at worst" (Dabay, 2017, p. 165).

is considered as an enthymeme, whose complete reading as a valid inference depends on a clause like “whenever it rains the streets will be wet” (Sellars, 2007 [IM], p. 3). Now, Sellars denies that this kind of addition is needed and states that its validity is different from formal validity: “It is raining, therefore the streets will be wet’ might well be as it stands a *valid argument*, though warranted by *material principle of inference*” (Sellars, 2007 [IM], p. 4; the first emphasis mine).

- (b) The fact that the validity of material inference depends on non-logical vocabulary means that it is valid due to its content and not due to its form. As is well known, the validity of formally valid arguments does not depend on any particular concept; all notions are intersubstitutable as long as the form is kept constant. The argument “all human beings are mortal, Socrates is a human being, therefore Socrates is mortal” remains valid even after any systematic change of ‘human being,’ ‘mortal’ and ‘Socrates.’ By contrast, changing ‘raining’ and ‘wet’ in “it is raining, therefore the streets will be wet” may affect the validity of the argument.

To put this in other words, the non-logical vocabulary can be changed without affecting the validity in the case of formal inferences, whereas the validity of material inferences depends on non-logical vocabulary or descriptive terms, and their relations. Sellars stated that “descriptive terms occur essentially in valid arguments authorized by extra-logical rules” (Sellars, 1953, p. 136), and he attributed to Quine the view that descriptive terms occur *vacuously* in logically valid arguments but essentially in extra-logically valid arguments (Sellars, 2007 [IM], p. 8; Sellars, 1953, p. 136). The lesson is that material inference does not accord with any universal form but is dependent on the content of concepts and background information about the relation, say, of raining and streets being wet.

- (c) Brandom emphasizes that material inferences are non-monotonic. In monotonic reasoning, additional information has no bearing and does not change the conclusion reached. By contrast, in non-monotonic reasoning an extra clause affects the validity of a conclusion, or in other words, additional information may defeat the conclusion. Brandom’s example deals with striking matches:

If I strike this dry, well-made match, then it will light ( $p \rightarrow q$ )

If  $p$  and the match is in a strong electromagnetic field, then it will not light ( $p \& r \rightarrow \sim q$ )

If  $p$  and  $r$  and the match is in a Faraday cage, then it will light ( $p \& r \& s \rightarrow q$ )

If  $p$  and  $r$  and  $s$  and the room is evacuated of oxygen, then it will not light ( $p \& r \& s$  and so on.<sup>7</sup>)

We see that at every step the conclusion of the previous step is retracted. And so material inference as non-monotonic reasoning is sensitive to additional information in a real-life situation. This is to say that material inferences are highly contextual.

<sup>7</sup> The legitimacy of what is inferred thus changes, when it is made in the changed circumstances, which means that any inferential conclusion is defeasible. This compares well to Sellars’s idea of a “reporting use,” that is, a report that is used as a conclusion of an inference (Sellars 1956, p. 271). Sellars’s rejection of the Myth of the Given by way of Jones’s changing color observations makes a similar point about how the circumstances affect judgement.

The problem with material inferences is their (assumed) validity, and in particular, the origin of this validity. Because validity is not universal or formal, it is not clear where it stems from or what it is based on. Indeed, one counterargument against material rules of inference, recognized by Sellars too, is Ockham's razor: there is no need for non-logical principles because logical principles are sufficient (Sellars, 2007 [IM], p. 4). The bottom line is that the authority of material principles should be original (thus, non-derivative) because material inference allegedly constitutes its own distinct category of valid inferences.

### 3 (In)validity, (in)dispensability and (ir)reducibility of material inferences

#### 3.1 The first attempt: material inference high formally valid

It is possible to characterize the status of material inferences as inferences by three notions: (in)validity, (in)dispensability and (ir)reducibility. Using these notions, we get several combinations, but it is not necessary to study each one-by-one because some aspects entailed by these take precedence over others. Unsurprisingly, the most important notion is the question of (in)validity. The answer to the (in)validity question of material inferences is bound to give us a clue about whether they can be reduced, which in turn provides information on whether material inferences can be discarded. The starting point is that, if material inferences are deemed invalid in contrast to Sellars's and others' thinking, and also reducible to some validating source, they are superfluous as inferences and therefore dispensable. They are then simply not needed in reasoning. By contrast, if they are valid as and by themselves, material inference is likely to be both indispensable and irreducible. The discussion below shows that the situation is far messier than this, but this is an apt point of departure.

Much of Sellars's paper "Inference and Meaning" reflects on Carnap's take on logical and extra-logical validity. Carnap's "logical transformation rules" and "extra-logical transformation rules" resemble formal and material inferences, respectively. Through Carnap's musings Sellars considers whether material inferences can be considered as valid, and if they can, what explains their validity.

We saw above that Sellars recognized the inference argument "it is raining, therefore the streets will be wet" as valid but through "a material principle of inference." It is not clear at first sight how this should be interpreted. Is it that the same kind of validity applies both to formal and material inferences? Or is it that there are two types of validity that apply respectively to the formal and the material principles of inference?

We need to ask what validity is. While there is no one definition accepted by all verbatim, there is a wide agreement on what is essential for a valid argument. Copi, Cohen and Rodych write in their influential *Introduction to Logic* (15th edition) that "[F]or the logicians the term valid is only applicable to deductive arguments. To say that a deductive argument is valid is to say that it cannot have all true premises and a false conclusion" (Copi et al. 2019, p. 23). While the notion of validity is cherished by logicians in particular, a valid argument must not necessarily be presented in logical notation. Further, it is useful to make a distinction between validity *simpliciter* and

formal validity. While all valid arguments must be truth-preserving, only some are formally valid, that is, *valid because of their form*. It could be said that formally valid conform to the rules of logic although even they are not required to be expressed in logical notation.<sup>8</sup> Let us then define validity as the characteristic property of argument that is truth-preserving, that is, an argument in which the truth of the premises entail the truth of the conclusion.

Let us now assume for the sake of argument that material inferences are valid. The question takes the following mode: Is validity a property of material inferences themselves or is validity a property of some other, reducible, principle or entity? Quite clearly, material inferences themselves are not necessarily valid in the default definitional sense. There is no guarantee that the sentence “the streets will be wet” is true, even if it were true that “it rains” (perhaps the streets are covered). So even discounting the presumption that validity requires the validity of the logical form, the kind of validity that is applicable to formal inferences is not applicable to material inferences, at least not in general and not directly.

However, it should be noted that some examples of Sellars’s material inferences are truth-preserving, such as his example of the inference argument “x is red; therefore, x is coloured” (Sellars, 1956, p. 1969). In other words, although this inference is not formal, it is truth-preserving. And because it is truth-preserving, it is valid according to the definition above.<sup>9</sup> Nevertheless, this does not alter the conclusion that validity as the property of truth-preservation does not characterize material inferences universally.

The validity of material inferences could then be perhaps reduced to (i) formal principles or be conceived of as an (ii) analytic entailment. The validity of material inferences would not be the property of material inferences but of some other principles or entities to which material inferences are reducible. However, it is now obvious that, by definition, the first option (i) does not do. Material inference is defined by Sellars as something that is (allegedly) valid (somehow) but not formally valid. In order to turn material inference into a formally valid inference, we would need to add an extra clause, such as “whenever it rains the streets will be wet, it is raining,” but this would be equivalent to nullifying the idea that there are genuine material inferences.

<sup>8</sup> Interestingly, terminology varies slightly. For example, Bergman, Moor and Nelson write only about ‘deductive validity’ (1998, pp. 11, 24). Watson and Arp write that only a deductive argument, whose conclusion cannot be false if premises are true, can be valid (2021, pp. 33, 34). Also Lepore and Cumming refer to ‘deductive validity’ (2013, 10) but make a distinction to ‘formal validity’. All valid arguments are deductive but only some are valid due to their form and some other due to the content of non-logical expressions, such as that “if John is a bachelor, then he is unmarried.” Although the argument “if John is a policeman, then he is unmarried” shares the form with the former sentence, it is not valid (2013, 23–24). However, the edition 2023 *Encyclopaedia Britannica* adopts a different approach mixing the categories of valid and formally valid. It states that in a valid argument the truth of the premises logically guarantees the truth of the conclusion. This means that “whenever the premises are true, the conclusion must be true, because of the form of the argument” (<https://www.britannica.com/topic/validity>) To take one more example, Henle, Garfield and Tymoczko refer only to ‘validity,’ and as something that guarantees the truth of a conclusion if the premises are true (2011, pp. 69, 172).

<sup>9</sup> Additionally, this inference is not non-monotonic. The description of its, say, size, location or cost does not defeat the inference. Naturally, if the first part of the inferential argument takes the form of “looks red,” then the situation changes also in Sellarsian framework, as it hinges on what “standard observers [observe] in standard conditions” (Sellars 1956, p. 1969). I thank Willem A. deVries for pointing out the possibility of non-non-monotonic material inferences.

How about a conceptual solution (ii): to think that it is analytically true that whenever it rains the streets will be wet, or to take another example by Sellars, whenever a piece of chalk is dropped it will fall? To put this alternatively, the suggestion is that the concept of raining entails wet streets and the concept of chalk its falling when dropped. Quite clearly, this is a non-starter, too. Although the validity of material inferences depends on non-logical vocabulary, there is no suggestion that there is anything like an analytic entailment between the concepts. Although “this piece of chalk will fall” can be inferred from “this piece of chalk is being dropped” there are no meaning relations between ‘chalk,’ the ‘dropping of chalk’ and the ‘falling of chalk’ anything like between ‘triangle’ and ‘three angles’ which would enable inferring one from another on the basis of their meanings alone. Instead, the relation is clearly synthetic. Naturally, this kind of reasoning is familiar from Hume, who pondered whether causation could be justifiable by “relations of ideas” so that the cause and effect of an object could be deduced by analyzing the idea of an object, such as a billiard ball. As is well known, Hume denies that this is possible.<sup>10</sup>

### 3.2 The second attempt: material inference as non-formally valid

It seems evident now that the validity of Sellars’s material inference is not the same kind of validity as formal validity, that is, an inference in which the truth of the premises guarantees the truth of the conclusion, which takes us to our second option: the validity of material inferences is some other, non-formal, kind of validity. After rejecting the proposition that material inferences could be justified conceptually or by way of logical entailment, both Hume and Sellars indicate that the connection between raining and wet streets is based on our experience. This is, of course, a very plausible thought. Thus the third option to try to justify material inference is by (iii) empirical generalization. The crucial question is whether an(y) empirical suggestion can be considered as *valid*.

Although the reduction to an empirical generalization did not explain all examples of material inference, such as ‘A is red; therefore, A is coloured,’ the possibility of reduction would question the (autonomous) principle of material inference, and additionally, perhaps point towards a distinction between conceptual and empirical truths, as in logical empiricism. Broadly taken, this is the setting of the debate between Sellars and Carnap, which inspired Sellars to develop the notion of material inference.

This third option (iii) that explains material inference by way of an empirical generalization shifts the focus from the logical and conceptual to the non-logical realm. For example, an inference of “x is an acid” from “x turns litmus paper red” would be based on experience that this is what has happened before—and can be expected to hold also in the future. Unfortunately, this suggestion is also problematic for reasons that are well known: the validity judgement seems to be based on inductive reasoning. It is obvious that experience alone does not make this inference valid, although experience

<sup>10</sup> For example: “A stone or piece of metal raised into the air, and left without any support, immediately falls: but to consider the matter a priori, is there anything we discover in this situation which can beget the idea of a downward, rather than an upward, or any other motion, in the stone or metal? ... Every effect is a distinct event from its cause. It could not, therefore, be discovered in the cause, and the first invention or conception of it, a priori, must be entirely arbitrary” (Hume 1902).



makes this kind of inference psychologically plausible. We expect the same kind of litmus paper to turn red if it is dipped in the same kind of acid, but here it is validity that is under consideration. Sellars concludes that the inference that the streets will be wet from seeing rain is in fact “merely the manifestation of a *tendency to expect* to see wet streets when one finds it raining, a tendency which has been hammered into the speaker by past experience” (Sellars, 2007 [IM], p. 5; emphasis in original). This kind of reasoning can only “simulate inference,” since it is in fact “a habitual transition of the imagination” (Sellars, 2007 [IM], p. 5). If one is interested in *validity*, this is bad news, because a Humean kind of expectation or habit seems to shift the problem beyond validity considerations altogether into the realm of psychology. Finally, Sellars thinks, in fact, that the problem of induction has been misconceived, because there is no safe ground of observation to start with (Sellars, 2007, p. 54n5).<sup>11</sup> An inductive inference is really just another material inference. No matter how we look at the matter, this means that the legitimacy of material inference itself must then be grounded in something else than in empirical generalization.

### 3.3 The third attempt: material inference reduced to the laws of nature

It is worth pausing to consider yet another possibility: (iv) the material rules of inference are based on the necessary laws of nature rather than on empirical generalizations. Indeed, Sellars’s reading of Carnap was that, for Carnap, material rules of inference are reducible to logical rules, perhaps enabling turning a materially valid inference into a logically valid inference by way of using a law of nature as a premise in the inference (e.g. Sellars, 2007, p. 14–16).

Let us forget for the moment that this reduction would likely turn material inference into some other kind of inference. Reference to the laws of nature would provide a conceptual tool that satisfies even the most stringent demands set for reasoning: necessity. Naturally, if an implied law makes our empirical inferences *necessary*, nothing could be more reliable: a material inference argument would be deductive. However, an immediate trouble is that it is far from clear which laws are necessary, how their necessity is established in nature and how they are distinguished by us from mere regularities. A still bigger problem is that, while this would provide a solution to the validity of material inferences, the reduction of material rules of inference to metaphysically necessary rules would shrink the scope of material inference drastically and make most *de facto* material inferences uninteresting. An inference from raining to wet streets is hardly based on any necessary rule of nature as such. Sellars and Brandom, in particular, consider material inference as something that is widely used and applicable in our language and discourse in all kinds of circumstances, which goes far beyond inferences that can possibly be conceived of as relying on the laws of nature. The interesting prospect of there being genuinely and independently rationally authoritative *material* inferences operative in general in our practice would fade away: a very limited and unpragmatic solution.<sup>12</sup>

<sup>11</sup> The paper is “Some Reflections on Language Games.” Sellars quotes here himself. The original is in Sellars’s 1952 paper “Particulars” (p. 195).

<sup>12</sup> I thank Marabel Riesmeir for her comments on this section.



It is now time to draw some preliminary conclusions on what has been achieved, and what has not, so far in this paper. Firstly, we have not managed to define the meaning of the *validity* of material inference. Secondly, in actuality it seems that *material inference is not valid*. If the truth of the premises does not guarantee the truth of the conclusion, we are not talking about validity, strictly speaking. Alternatively, one may naturally try the other horn mentioned above, namely, that the validity of material inference is of its own kind, if this is understood loosely enough. As is always the case when a standard understanding of a concept is questioned, it is not obvious which approach to take: whether the concept should be replaced by another notion or whether the concept should be given a new, and possibly radically different, content. It is true that ‘validity’ is used much more loosely in common language than to designate truth-preserving inference, noted also by Copi et al. (2019, p. 23). It would not be impossible claim validity and re-define it in some looser way to designate goodness of inference. My preference here is to say that material inference is not valid, strictly speaking, exactly because validity is so intimately associated with the technical notion of validity in philosophy, and in particular, in logic.<sup>13</sup> For clarity’s sake, I have opted for replacing validity by other good-making attributes of reasoning. The advantage here is that we can now take a step forward and try to understand what Sellars was getting at when he suggested that material inferences are valid: what his pragmatism is fundamentally like. This also paves the way for spelling out what the idea of material inference means for reasoning and rationality.

#### 4 Pragmatical grounding of material inferences

Let us return to the three notions: (in)validity, (in)dispensability and (ir)reducibility. It is now old news that material inference is not valid, when validity is taken as a property that guarantees the truth of the conclusion inferred from true premises. Nevertheless, attempts at reduction have been resisted because then we would not be talking about material inference at all (if reduced to formal principles or the laws of nature) as widely used manifestations of reasoning in natural language. Further, reduction via analyticity is not warranted at all, while reduction to empirical generalizations would be a reduction to the inductive principle and cast serious doubt on whether material inferences are justified at all. So the preliminary conclusion is that while material inferences are not valid (although neither necessarily invalid), they are not reducible either.

The jury is still out regarding (in)dispensability. This score must be decided on the basis of a rationality judgment: whether material inference can be seen as rational, although not valid, and whether the *rationality* of our *de facto reasoning* is important in the first place. Perhaps material inferences are irrational and indicative of an irrational aspect of our thinking? It is possible to think with Hume that we simply cannot dispense with material inferences, like we cannot discard causal reasoning, even though they

<sup>13</sup> Dabay opts for a different solution: “An inference is materially valid iff the categorical propriety of its premise(s) guarantees the categorical propriety of its conclusion” (Dabay 2017, p. 168). Willem A. deVries emphasized that reclaiming validity to make it suitable for ordinary discourse might be a way to go too. I thank for that suggestion.

are not rationally justified. While Hume is skeptical about the justification of causal reasoning, he does not suggest that we stop using causal inference or induction. We use them out of habit and because we cannot live our daily lives without relying on them. Now, when a similar idea is applied to material inferences, it reasons that that validity is not applicable to material inference because material inference is merely “a *tendency to expect*,” and there is no more to be said about their rationality or justification. We can and maybe also need to keep using them and should just accept that our thinking is irrational in this regard.

However, I think that this is too hasty a conclusion, as our investigation into the nature of material inferences has not run its full course. It should also be noted that neither would this be a very pragmatist way to look at the matter. Namely, this would mean adopting an externalist standard on justification and rationality, while the pragmatist begins with practice and assumes that it is the ultimate judge regarding rationality and justification. The pragmatist typically thinks that our practices are by and large reliable and some practices rational, and attempts to find out in what sense this is the case.<sup>14</sup> More generally, pragmatism means that explanations and meaning are cashed out through their practical consequences or that practice is prioritized over theory. As Brandom puts it, the right order of explanation is the one that begins with what people *do*, recognizing that their doing contains implicit content, and only when this is recognized, can one progress to analyzing what is believed and said explicitly (Brandom, 1994, p. 101). For example, in Sellars’s pragmatism, the practice concept of *rejection* is more basic than the logic concept of *negation* (Sellars, 2007, p. 299). In this way, Sellars prioritizes the concrete step whether to accept or reject something over a theoretical computation of truth-values.

However, although this points us in the right direction, the reference to practice that is impregnated with implicit content does not settle the problem of legitimacy of material inference. After we have abandoned validity as a defining feature of material inferences, progress in this analysis requires recalibrating the aims. What is at stake here is the cognitive, or perhaps better, the rational authority of material inferences. Sellars attempts to show that material inferences are on a par with formal inferences and that we can take them as autonomously reliable inferences. To repeat, this rational authoritativeness is not to be explained by any (hidden) formal validity, or analyticity, nor by empirical generalizations or the laws of nature. Then the question is: What is it that makes them rationally authoritative? Why think that it is fine to infer from “I drop this piece of chalk” to “this piece of chalk falls”? What I wish to argue below is that the property that legitimizes is not anything hidden, nor discernable in the surface grammar, but provided by the circumstances in which an inference is made. The notion that explains why material inferences are legitimate inferences is *pragmatic propriety*.

---

<sup>14</sup> One can think of Thomas Kuhn’s philosophy here. While one interpretation understands Kuhn as an irrationalist about theory choice, another and more feasible conceives of him as a natural rationalist who thinks that the standard of rationality must be found in actual scientific practice, not through an external ideal rationality.

## 5 Pragmatic propriety

An empirical content, or an experience of it, may be understood to create a psychological expectation of what should take place, such as that rain is followed by wet streets. Sellars called this “tendency to expect” or “a habitual transition of the imagination” (Sellars, 2007 [IM], p. 5). Yet the judgment of correctness and incorrectness is not psychological. It is normative and social; therefore it is necessary to articulate explicitly what creates an entitlement to draw a specific inference. Normative attitudes that determine and preserve the goodness of an inference are undergirded by the social order of a community and its linguistic practice.

It is important to understand the significance of context-dependency. Context-dependency is characteristic of material inferences, which is well exposed by their non-monotonicity. Non-monotonicity thus means in effect that the truth of the antecedent does not guarantee the truth of the consequent. Even if it were true that it is raining, it is not guaranteed that streets will be wet. Brandom illustrated this feature with the match-striking example (above). Normally, if a dry match is struck, it will light. And a material inference to this conclusion is good. But if the match is in a strong electromagnetic field, for example, this conclusion does not follow and the respective inference to this conclusion is bad. Adapting Sellars’s language we may say that, while the principle that legitimates the inference is stated explicitly in formal inference, this principle is left to be supplied by the context in material inference.

The upshot is that because the legitimacy of material inferences does not stem from any *generally or universally validating principles* that would always hold, they should be treated as specific acts under specific circumstances. Therefore, understanding legitimacy means deciphering in what *making* legitimate inferences consists *in the situation*. For example, physical entailment or necessitation comes down to thinking that one is, *in practice, entitled to infer* that something is B, given that it is A. And this means taking a normative approach to *what is permissible to infer* in the circumstances, such as: given assertion A, it is permissible to assert B; given assertion not-A, it is not permissible to assert B, and so on. Furthermore, causal language and (it as) physical entailment are reduced to inference licenses to infer B, given A.

In other words, material inference as a subjunctive conditional is not a statement of credentials but itself a singular license to act in a certain way in given circumstances. Sellars writes that induction should be conceived of as “as establishing principles *in accordance with which* we reason, rather than major premises from which we reason” (Sellars, 1958, p. 286). To put this metaphorically, “the ‘season inference ticket’

If anything were A, it would be B

is actually an *inference* ticket, and not, so to speak, a *letter of credit* certifying that one has a major premise and a *formal inference* ticket at home” (Sellars, 1958, p. 286). This is to say that there is no general recipe proving that this inference is correct; what can be concluded is simply that ‘if A, then B’ can “in all probability” be inferred.

John Norton’s recent material theory of induction (2003, p. 2020) resembles the idea of material inference in that it does not conform to “universal schemas” but argues

that “all inductive inference is local” (Norton, 2020, p. 6).<sup>15</sup> He is likely correct in that we have been misled by the model of deductive logic to look for universal schemes in all inferential practice. He suggests that “what separates the good from the bad inductive inferences are background facts, the matter of the inference, as opposed to its form” (Norton, 2020, p. 18). However, it cannot be facts as such either. There are an infinite number of facts, and none of them can be translated into a warrant of anything without a judgment. Ingo Brigandt rightly argues that there are better ways to reach Norton’s target. He writes that “a more decisive way to reject formal schemas ... is ... that all inference is material inference”. Brigandt defines a legitimate material inference as something that is justified in virtue of its content, and more precisely, in virtue of “empirical content embodied in the concepts in the premises and conclusion”. Material inference entails this generalization, which “merely makes the given content explicit” (Brigandt, 2010, pp. 33–34).

In Sellars, material inference comes down to *derivability* in given circumstances. Derivability ought to be understood here as ‘may be done’ or ‘is permissible’ to infer something from something. This is *an act that is conditional*, unlike traditional unconditional rules in logic.<sup>16</sup> It follows that evidence or grounds matter. One consequence is that while a contradictory sentence cannot be asserted in the case of unconditional rules, a contradictory sentence can be asserted in the case of material inference. And so material inferences are not in the business of certainty or certifying the truth of a conclusion (when undefeasibility is understood as a property of truth).

The crux of the matter here is that derivability in the form “that it is permissible to assert B, given that one has asserted A, whereas it is not permissible to assert not-B, given that one has asserted A” (Sellars, 2007, p. 19) establishes *a rule* of conditional assertion. Modal expressions of entailment and necessitation, such as that ‘A entails B,’ can be situated in a practical context in which one is required to explain why B or justify B, given A: “Thus, even if to state that p entails q is, in a legitimate sense, to state that something is the case, the primary use of ‘p entails q’ is not to state that something is the case, but to explain why q, or justify the assertion that q” (Sellars, 1958, p. 283). Further, Sellars writes:

“Well, then” it may be said, “if all Mr. E[ntitlement] wishes to claim is that on occasion we ‘know’ ourselves ‘entitled to infer’ that something is B, given that it is A, what is all the fuss about?”

The fuss is about the inverted commas around ‘*know*’ and ‘*entitled to infer*’” (Sellars, 1958, p. 285). And although this is seemingly a linguistic (or metalinguistic) affair, to answer what it is to ‘know’ or ‘be entitled to infer’ something from something in a given circumstance means stipulating permissibility in pragmatical terms, that is,

<sup>15</sup> Norton writes that for Brandom, “inference is material since it is made good by the concepts invoked in the premises. In my view, it is material since I locate the warrant for the inference in the background material fact.” However, Norton adds had he known about Sellars’s and Brandom’s use, he would have likely chosen a different name for his inductive theory of material inference (Norton 2010, 68–69).

<sup>16</sup> Similarly, Dewey writes that, although habits of inference can be formulated as rules and principles, they are nevertheless not the formal “premises of inference or argument” but instead “conditions to be satisfied” (Dewey 1938, 12–13).

specifying the kinds of circumstances in which an inference is justified. And this takes us, finally, to the heart of the matter. Pragmatic propriety explains legitimacy:

One is entitled to infer B, given A, when one has a pragmatic propriety to do so.

What is pragmatic propriety in other words? ‘Propriety’ or ‘proprieties’ is Brandom’s key concept. It refers to all those inferential entitlements that a concept has. For example, the proprieties of the term ‘red’ is an inference to ‘colored,’ application to anything that is red and so on (e.g. Brandom, 1994, pp. 89, 119 and *passim*). Propriety includes both linguistic and non-linguistic conditions, including non-inferential perceptual circumstances (Brandom, 1994, pp. 119–120). According to Brandom, practice contains proprieties implicitly, and proprieties are made explicit in linguistic acts, and further, rules or principles that guide this practice are propositional explanations of these proprieties (Brandom, 1994, p. 77). More generally, propriety means conformity to accepted standards of behavior or morals, or in short, what is socially accepted. Material inference should be understood against the background of the nature of inferring in general as “interpersonal ... as an aspect of an essentially *social* practice of communication” (Brandom, 1994, p. 158). This is to say that it is not the logical, the metaphysical or the empirical that justifies material inference. The mastery of proprieties is manifested in a practical know-how, that is, “knowing one’s way around the bit of the web centered on one conceptual content, being able to tell in practice which moves to it and from it are permitted or required and which forbidden” (Brandom, 1994, p. 90).

It is important to emphasize that pragmatic propriety justifies all kinds of material inferences and not only those that look conceptual, as we have discussed above in the case of empirical inferences. However, one possible objection here is indeed that we should make a clearer difference between those inferences that look conceptual, such as color concepts, and those inferences that look empirical, such as the relation between raining and wet streets.<sup>17</sup> Yet, firstly, it would be problematical to think that there are distinct meaning and empirical categories, if this is what is meant, as the discussions on the dichotomy of analytical-synthetic in the history of analytical philosophy attest to. Additionally, for a pragmatist of any colour this would be a very counterintuitive move.

In inferentialism, there is no principled or categorical difference between these kinds of expressions because the inferential role of an expression in the use of language *is* the same as the conceptual content no matter the kind of expression (e.g. Brandom, 1994, p. 619). Brandom (correctly) attributes the following view to Sellars: “material inferences are essential to the meaning (content) of nonlogical locutions” (Brandom, 1994, p. 103). Sellars writes that “the difference between observation predicates and theoretical constructs is not that the former have a conceptual status independent of material moves (implicit definition) whereas the latter are implicitly defined predicates in a system which is ‘interpreted’ by a ‘dictionary’ which ties certain expressions in the theory with empirical constructs. Rather, the conceptual status of theoretical and non-theoretical expressions alike is a matter of material (as well as formal) moves” (Sellars, 2007, p. 54). In other words, both expressions that look more conceptual and those that

<sup>17</sup> I thank Celiné Henne for this remark.

look more empirical go under the category of the “non-logical.”<sup>18</sup> Yet, although no expression is purely analytical, the roles admittedly do seem to be somewhat different; one is closer to the empirical and the observational than the other. My suggestion is that the difference is captured best not by establishing a distinct meaning category or by thinking that there is a difference in kind between the meaning and the empirical, but by embracing that there is *a difference in degree regarding their inferential roles*. It should be remembered that Sellars’s theory of meaning accounts not only for intra-linguistic moves and inferences, but also for language-entry and exit moves. In brief, the correct application of an expression is both part of its meaning and its correct, legitimate, use.

It should now be evident why it is not possible to get a single general rule or instruction, or even a small set of them, on the level of inferencing, as in the case of formal inference: concepts and contents, and their respective proprieties, vary indefinitely. Proprieties for specific actions are local and practical, and also the judgment of the correctness of an act is local. To put this in other words, material inferences do not instantiate a universal form because empirical content, in particular, can vary endlessly depending on the subject of study and the discipline. In brief, licensed inferences, judgements, and respective “rules” are very different between the sentences, say, “it is raining,” “this is red,” “there is an atom,” and “this is a mother.”

## 6 The plurality of forms

Material inference is a matter of practice, a license to act in a certain way; to draw an inference. Most primitively, material inference comes down to a linguistic act from one claim to another, which are often expressed in a subjunctive conditional of the following kind: given that A, it can be inferred that B, but more generally as any kind of inferential entitlement between ‘A’ and ‘B’. These kinds of linguistic transitions cannot be validated by their forms but are accepted because of an inferential association between two claims, such as an inference from ‘it is raining’ to ‘streets will be wet.’ This practice, doing, constitutes the foundation for all reasoning practices including logical, which can be conceived of as a special codified system of linguistic acts. Therefore, reasoning is relative to a form of life, when the form of life is understood to include various kinds of cognitive formations and disciplines. This thought entails the promise of pluralism in reasoning, that is, life-form-specific inferencing. Inferences, such as ‘it’s raining; therefore, streets will be wet’ and ‘when I release this piece of chalk, it will fall’ are part of our “world story” of how the world is, which is embedded in our thinking and doing.

Although Sellars thinks that material rules are indispensable in natural language that contain descriptive terms, he does not agree with “Metaphysicus’s” idea that there is only one conceptual frame which can be split into the systems of formal and material rules. Instead,

<sup>18</sup> An additional observation is that Brandom’s examples of material inferences (e.g. Brandom 1994, p. 98) look rather different from a logical point of view. Yet logical implication as the key logical modelling notion of material inference, as developed by Stoval (2019), does not capture all kinds of material inferences in Brandom.

we recognize that there are an indefinite number of possible conceptual structures (languages) or systems of formal and material rules, each one of which can be regarded as a candidate for adoption by the animal which recognizes rules, and no one of which has an intuitable hallmark of royalty. They must compete in the marketplace of practice for employment by language and be content to be adopted haltingly and schematically. (Sellars, 2007[IM], p. 26; similarly, Sellars, 1953, p. 138)

Now the key question of the paper takes a different configuration: Given that there are “expressions of material rules of inference” (Sellars, 2007 [IM], p. 16) and that “a rule is always a rule for doing something” (Sellars, 2007 [IM], p. 18), what are *these rules* that regulate inferencing? Brandom’s strategy is indeed to take material inferences as more fundamental than formal, and the formal goodness of inference explainable in terms of material goodness of inference. Brandom replaces the idea of universal form with the idea of field-specific form. Normally, an inference that is valid due its form is understood as one that cannot be invalidated by (systematic) substituting of non-logical vocabulary. It is the (logical) form that guarantees validity. The twist here is that irreplaceable and validity-ensuring logical vocabulary is treated as a special case of (material) “validity”: “For a given subset of vocabulary that is privileged or distinguished somehow, an inference can be treated as good in virtue of its form, *with respect to that vocabulary*” (Brandom, 1994, p. 101). So one kind of goodness is specifically due to their logical form, but there are other forms too:

if one picks out specifically zoological vocabulary or moral vocabulary or theological vocabulary to the role of the distinguished K-vocabulary [that which is not substituted], the substitutional mechanism will take as its input a practical classification of inferences into good or bad, correct or incorrect, and yield as its output a distinguished set of inferences that are not just good, but are good in virtue of their zoological, moral, or theological form. (1994, p. 105)

Brandom adds that this mechanism is “perfectly general,” although the validity of the goodness of the inference is field-specific. There are many kinds of forms, and as a consequence, many kinds of justified reasonings.<sup>19</sup>

What is the relation of these field-specific forms and pragmatic propriety licensing a specific material inference? A good way to approach this question is to note that pragmatic proprieties are different in distinct fields because empirical and conceptual contents that yield inferences are different as a result of their discipline-specificity and diverse subject matters. Material inference is a linguistic inference whose warrant depends on the legitimacy to take a specific action in given circumstances determined by these field-specific “forms.”

However, this is only the first and the preliminary conclusion. Provided that this kind of pluralism in reasoning suggests that material inference is the Many, and not

<sup>19</sup> Also Dewey rejected logical forms as instances of pure abstract reason and suggested that “all logical forms ... arise within the operation of inquiry” (1938, pp. 3, 4). Inquiry thus creates its own logical standards and forms to the extent that subject-matter and form correspond to each other. Each inquiry is directed towards success and “to achieving enduring beliefs”. The abstracted forms can be formulated “only after an inquiry has proceeded a considerable time and has hit upon methods that work successfully.” Only then it is possible “to extract the postulates that are involved” (1938, p. 18).



the One, to use this traditional expression, it is worth still asking how many: What kinds of forms can material inferences take? And what is the rational force of any one of them in other domains of reasoning? Is it possible that these many reasonings share something in common? In a word, is material inference fundamentally local or universal?

Although the practices of, say, physics and historiography, are different from each other, it is not evident on this basis *alone* that these practices could not share something in common too, such as a commitment to certain practice-guiding values. Whether this is so cannot be established in this paper; nevertheless, some preliminary thoughts about the matter are well in order.

The bifurcation of locality versus universality can be detected on many levels. The first one is language and the mastery of language. Language is a universally shared skill and practice of human communities, which can therefore be understood to constitute the universal base of rationality. This is indeed the way that Brandom goes. Compared to other animals, an important demarcation criterion is the human's capacity to use language as "concept-mongering creatures," the skill of which is inherently linked with the propensity to recognize reasons in discourse and to play "the game of giving and asking reasons." Sellars's idea of "the logical space of reasons" is naturally very similar. However, singular concepts, when conceived as rules against the background of the general language mastering capacity, multiply the number of rules indefinitely within the game of giving and asking for reasons.

One possibility is that material inferences, as manifested in our practical reasoning and language, share patterns that are different from universal and unconditional rules of logic, but which may nevertheless be written down and expressed in some general form. Jansen and Strobach (2003) make an interesting suggestion for how material inference could be modelled by way of a new *logic of concepts*. Another similar suggestion for modelling material inference is made by Stovall (1999), who analyzes a subclass of material inference, generic inference,<sup>20</sup> by the machinery of proof theoretic logic. My suggestion is that these attempts are understood in the spirit of Brandom's expressive logic, according to which logic can express but does not ground language and material inference.

In addition to the attempts to find shared reasoning patterns or principles of material inference, the other option is to concentrate on field-specific forms of reasoning. This type of pluralism emphasizes the local nature of material reasoning, explainable perhaps by variable conceptual contents, beliefs and empirical knowledge in different disciplines. The idea is that legitimate material inferences are irreducibly plural and 'material inference' should be understood as the name of the category that denotes this multiplicity. Brandom's idea was that each discipline and vocabulary determine which inferences are good (Brandom, 2000, pp. 55, 86). Indeed, the spirit of this idea is well evidenced in the history of science, and in particular in the three historiographical projects of Crombie (e.g. 1994), Hacking (e.g. 1992) and Jardine (2000). All these approaches convey the message that in the history of science there have been and still are many, discipline-specific and even larger, ways and frames for legitimating claims in the sciences. And this is the way in which reasoning, and its legitimation, is

---

<sup>20</sup> Generic sentences are attributions of properties to individuals, such as 'the African lion is dangerous.'

Many. Finally, this captures well and develops further Sellars's idea of self-legitimizing material inferences and material principles.

Importantly, it is always a social judgment when something is judged to be incorrect; this judgment may be prompted by external impulses but the judgment itself is guided by the values of a community. The interesting question is then what values guide this kind of social judgement. These might be called Rules with a capital 'R' because they operate on a non-linguistic practice-guiding level.

My suggestion is that in most general terms this guiding principle can be named coherence, or to put it in action-guiding terms, an attempt to maintain coherence or to improve the coherence of an inferential network and practice. Sellars writes that in our "world picture" we try to achieve "a maximum of 'explanatory coherence'" (2007, p. 54) and similarly that each of the sciences operates within "the ideal of a coherent system" (1956, p. 316).<sup>21</sup> Changes to legitimating material inferences, implied by pragmatic proprieties, stem from attempts to remove contradiction and incompatibility in our web of beliefs. There are other pragmatic incentives, such as the commitment to consistency, to conceptual entailments and to conceptual consequences.

In coherence, attempts to delegitimize certain inference arguments and legitimize an inferential network coincide. Material inference is legitimate only insofar as it keeps our system of belief, or our inferential network, coherent or improves its coherence. Provided that the pragmatic propriety is based on our socially moored and structured conceptual and empirical content, and that it is manifested in the applications of material inferences in linguistic and extra-linguistic circumstances, the legitimacy of material inference does not need to rely on any other, external, standard.

The interesting issue is that this affirmative answer, that there is something like shared epistemic *practice* or a set of *values*, would seem to close the circle and show that there is a general form of rationality, after all; only this time, it does not take the shape of anything like abstract ahistorical rules of logic but of shared rules and principles embedded in practice in what we do (improve coherence), and in different conceptual structures and cognitive enterprises.

## 7 Towards consistent pragmatism

The main argument of the paper, the argument for pluralism in reasoning, is congenial with Brandom's inferentialism. That is, good inferences are socially sanctioned steps in the game of giving and asking for reasons, which entails pluralism of reasoning given the variability of socially formed practices. It is true that inferences and their sources of legitimacy may seem different: some are legitimate because of form (e.g. a categorical syllogism, e.g. 'all dogs are mammals'; 'Bob is a dog'; 'Bob is a mammal'), some because of meaning (e.g. 'A is red; therefore A is coloured') and some because of empirical matters (e.g. 'thunders, it will rain soon'). However, this diversity notwithstanding, they are all socially sanctioned on the basis of communally

<sup>21</sup> This is congenial to Chang's (2022) idea of "operational coherence" although his notion is probably more extensive. On one occasion, Sellars restricts coherence to "each special science dealing with some aspect of the human organism" (Sellars 1956, p. 316) but it is of no consequence for the methodological view.

held conceptual contents and rules; and from this perspective, they are not principally different.

What then does this paper add to Brandom's project? Firstly, although material inference is a key notion in Brandom, it has remained underanalyzed. This paper attempts to remedy this situation by providing a detailed analysis of material inference. In particular, Brandom does not spell out the relation between material inference and pluralism in reasoning, nor does he ponder its links to actual studies of plural reasoning in the history of science. Secondly, while the approach of this paper is in general well aligned with Brandomian inferentialism, I will argue that there is an internal tension in Brandom's philosophy that must be avoided. It emerges from his commitment to human practice and discursive activity as the ultimate arbiter of knowing and meaning, on the one hand, and his aspiration to confer objective status to some of our inferences, on the other hand. This threatens to render Brandom's idea of normativity problematically transcendental, and therefore, incompatible with the pragmatist approach. Let me explain this in detail.

As we have seen, Brandom does not write about the validity of material inference but of its "goodness" (e.g. 1994, p. 130, 131), although this makes it no easier to determine in what goodness of inference consists. Wanderer in his book *Robert Brandom* (2014) suggests that a good inference is an inference that is treated as a good one. This definition takes us only so far because a community could in principle treat any inference as good if the judgment of goodness hinges on a willfully adopted attitude. Brandom's and Wanderer's suggestion comes down to the idea that good or correct material inferences preserve their normative status from the premises to the conclusion, which means preserving commitments and entitlements attributed "by the implicit practical attitudes" (Wanderer, 2014, p. 115). But what is it exactly that preserves the normative attitudes? If it is a commitment in the case of deduction and an entitlement in the case of inductive inference,<sup>22</sup> this raises the question why these normative attitudes are preserved; the formalist might suggest that it is the form and not the content that carries the normative status over.

Brandom writes that rules have a normative 'grip' or 'compulsion' on us because of our normative attitudes. As he puts it, "what makes us act as we do is not the rule or norm itself but our acknowledgement of it" (Brandom, 1994, p. 31), adding that the status of the rule is "instituted by our attitude" (Brandom, 1994, e.g. pp. 31, 52). Brandom thus thinks that it is our own activity that "institutes norms, imposes normative significances on a natural world ... like a cloak thrown over its nakedness" (Brandom, 1994, p. 48).

Indeed, it is reasonable to hold that normativity is of our making, not of the world's. But if this is so, the approach still looks problematically subjective and susceptible to the problems of relativism. Can any attitude make one's inference correct? Does this apply to any inference? Brandom recognizes this problem, too, and suggests that there is something that takes normativity beyond any individual: though the status of obligation comes down to our attitudes, the determination of correctness and incorrectness is not up to us. Instead, it is the case that "endorsing a rule gives it a grip on us" (Brandom, 1994, p. 52). This is the view that was initially proposed by Kant, who

<sup>22</sup> See Wanderer (2014, p. 115).

made a distinction between an individual's assessment of the norm and the status of the norm as determining correct and incorrect acts beyond the individual.

But what exactly is then responsible for this kind of trans-individual 'grip' or normativity? It is worth quoting Brandom on this:

It is a fundamental feature of our understanding of our concepts that they incorporate *objective* commitments. Thus, our use of the term 'mass' is such that the facts settle whether the mass of the universe is large enough that it will eventually suffer gravitational collapse, *independently of what we, even all of us and forever, take those facts to be*. We could all be wrong in our assessment of this claim, could all be treating as a correct application of the concepts involved what is objectively an incorrect application of them. (Brandom, 1994, p. 53; my emphasis)

Brandom thus thinks that there is something non-human objective that compels us and our inferentially based opinion-making. Simply put, "we can not only *each* but *all* be in error" (Brandom 1994, p. 497).

The problem, as Brandom sees it, is that the "I-We" intersubjective notion of objectivity (i.e. objectivity that is irreducibly communal) loses an ability to make a distinction between being correct and incorrect on the part of the whole community. Brandom writes:

The essential part of the representational dimension of our concepts—the way they purport to apply to an objective world—is that they answer for the ultimate correctness of their application not to what you or I or all of us *take* to be the case but to what actually *is* the case. Part of what it is for our concepts to be *about* an objective world is that there is an *objective* sense of correctness that governs their application—a sense of appropriateness that answers to the objects to which they are applied and to the world of facts comprising those objects. (Brandom, 1994, p. 594).

However, this kind of representational 'objective sense of correctness' is problematic considering pragmatism. Moreover, Brandom uses language that seems compromising regarding his anti-representationalist inferentialism. He writes about "representational correctness," which requires reading 'assertible' and understanding 'assertible conditions' in a "more objective sense." They are ultimately reduced to truth conditions and to the notion of objectivity in the sense of "transcending the attitudes of [all] practitioners" (Brandom 2000, p. 197, 198).

It is not clear that normativity requires this kind of community-transcendence. Some, such as Crispin Wright, have argued that the community is incorrigible. As he puts it, "for the community itself there is no authority, so no standard to meet" (Wright 1980, p. 2020). According to him, there is no first-person-privileged and 'ratification-independent' access to correctness and incorrectness, because it is the community that provides the criteria for the correct use, including for any non-standard extension, against which only 'non-standardness' can be measured. Rorty as well criticized Brandom for succumbing to the "realist-representational language" (Curtis, 2015, p. 75), such as 'representation,' 'correspondence to reality,' 'really is,' 'making true' and so on. While Rorty thinks that this is a rhetorical strategy with some worrying (authoritarian)

consequences, to me it looks more “sinister” in terms of its objectivist-representational connotations. Brandom says that non-discursive and non-conceptualized facts may settle objectively how some of our terms are used. It is unclear how this kind of truth- and community-transcendence would be possible if all knowing is situated in the inferential-discursive game of giving and asking for reasons, or alternatively, in the Sellarsian logical space of reasoning. To be clear, I am not objecting to the idea that the non-human and non-linguistic world constrains and guides our practices in many ways but to the old objectivist approach, whose remnants are still recognizable here, which relies on the idea that there is a ‘transcendental,’ ‘representational,’ ‘actually the case,’ ‘truth-conditional’ type of direct relation to the world devoid of any of our inferential and judgmental practices.

My view is that whatever objectivity there is stems from the fact that the *criteria* of norm application is beyond any individual. Therefore, an individual may be corrected in her application of a rule, which is to say that an individual can indisputably be wrong in light of the communal rules. But as Rorty emphasized, the status of belief depends on whether it is justified by way of our “historically contingent social practices of justification” (Curtis, 2015, p. 75). The world does not force any particular relation to the world upon us nor does it compel us to adopt any particular language game. That this is not so is exactly the root cause of pluralism in reasoning and the legitimacy of (diverse) material inferences.

For pragmatists, the distinction between *the claim* that something is so and so and that something is so and so is superfluous. Any statements of what is or how it is are always *claims* to that effect. Indeed, Brandom himself writes that “there is only the actual practice of sorting out who has the better reason in particular cases” (Brandom, 1994, p. 601). Instead of invoking community- and language-transcendental language, this should have been Brandom’s answer to the issue of normatively correct inferences. I agree with Rorty that a reference to the world of objects or facts without an accounting of what one takes them to be (e.g. Brandom, 1994, pp. 331, 594, 595) “is at odds with a view of what I take to be basic to pragmatism” (Rorty, 1998, p. 131). Objectivity is “the desire for as much intersubjective agreement as possible, the desire to extend the reference ‘us’ as far as we can.” (Rorty, 1991, p. 23) What we cannot do is to step outside of our role as users of normative judgments.

Now it is time to return to pragmatic propriety once more. What does it do for us? In order to distinguish legitimate from illegitimate inferences, there has to be something additional to our ‘attitude’ in the subjectivist sense. Yet, for the pragmatist there cannot be objectivity in the human discourse and practice transcendental way. It is us and our community that constrains what can be legitimately claimed. The feature that yields legitimacy and restricts illegitimate inference is called pragmatic propriety. Here we can profitably use Jaroslav Peregrin’s (2014) idea that the rules of our language are *restrictive*, not prescriptive. They restrict how language can be used but do not normally prescribe any one correct inference. For example, one is not required to infer from ‘this is red’ to ‘it is coloured,’ because one can equally well and legitimately infer to ‘it is not yellow’ and innumerable other sentences. But one cannot infer to ‘it is edible.’ To put its significance yet differently, pragmatic propriety explains why and when reasoning is legitimate in an individual case despite being so plural in so numerous contexts.

One final thing is worth adding. Naturally, all inferential practice takes place situated in the world, that is, in full interaction with the world despite the pragmatist prioritizing of human discourse over the mute world. There is then no danger of ‘losing the world’ as if we were in some kind of Wittgensteinian idle wheel that moves without moving anything else, or to use a more contemporary metaphor, chatting with a version of ChatGPT that operates in its own closed textual universe. As Sellars’s inferentialism stipulates, there are language-entry, language-intra and language-exit transitions. All that is denied is the possibility of the non-linguistic world determining the correctness of inferences for us.

## 8 Conclusion

The main conclusion of this paper is that material inference is not valid but that it is nevertheless a legitimate non-logical and non-formal inference. In a community, it is legitimate to make non-logical and non-formal inference arguments on the basis of the community’s historically formed inferential structure. Pragmatic propriety yields legitimacy on the basis of socially shared and structured, both empirical and non-empirical, conceptual content. This conceptual content is not anything like an analytical meaning but designates an inferential role of an expression in the network.

Taking material inference as legitimate does not presuppose referring to general principles or laws; instead, the consequence of a material inference can be directly accepted as long as one possesses a pragmatic propriety for it. The lack of it means that an inference is illegitimate. Non-valid but legitimate material inference draws our attention to the fact that all reasoning, including logical, is relative to a form of life, which makes reasoning fundamentally plural. Material inference can take indefinite forms because field- and subject-specific reasoning is open-endedly diverse.

The bifurcation of the local and the universal in material inference opens up two fruitful research programs. The one is to look for the general in the particular, for example through modelling the logical relations of material inferences. The other, equally interesting aspiration is to investigate the many modes of reasoning in different disciplines synchronically and diachronically in the history of science. My suggestion is thus that material *inferencing*, which aims at retaining and improving coherence, can likely take infinitely diverse material manifestations. Therefore, we should focus on studying and understanding the nature of the life-form specific regimes of reasoning, that is, disciplinary and any other formations of cognition that manifest our divergent reasoning practices.

**Acknowledgements** I thank the pragmatists at the HPS Cambridge for their productive comments and organizing fruitful reading groups and seminars, in particular Hasok Chang, Oscar Westerblad and Celiné Henne. I am grateful to Willem A. deVries for his feedback on the manuscript. My sincere thanks also to the anonymous reviewer, who provided extensive and detailed comments, which have contributed to the paper. Finally, special thanks to Andrew Pattison, whose copy-editing crucially improved the quality of this text

**Funding** Open Access funding provided by University of Oulu including Oulu University Hospital.

## Declarations

**Conflict of interest** The author has no conflict of interests to declare.

**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

## References

- Bergmann, M., Moor, J., & Nelson, J. (1998). *The logic book* (3rd ed.). McGraw-Hill.
- Brandom, R. B. (1994). *Making it explicit. Reasoning representing & discursive commitment*. Harvard University Press.
- Brandom, R. B. (2000). *Articulating reasons: An introduction to inferentialism*. Harvard University Press.
- Brigandt, I. (2010). Scientific reasoning is material inference: combining confirmation, discovery, and explanation. *International Studies in the Philosophy of Science*, 24(1), 31–43.
- Carnap, R. (1937). *The logical syntax of language*. Routledge & Kegan Paul.
- Chang, H. (2022). *Realism for realistic people. A new pragmatist philosophy of science*. Cambridge University Press.
- Copi, I. M., Carl, C., & Roduch, V. (2019). *Introduction to logic* (15th ed.). Routledge.
- Crombie, A. C. (1994). *Styles of scientific thinking in the European tradition: The history of argument and explanation especially in the mathematical and biomedical sciences and arts* (Vol. I). Duckworth.
- Curtis, W. M. (2015). *Defending rorty: Pragmatism and liberal virtue*. Cambridge University Press.
- Dabay, T. (2017). Naturalism and inference on the need for a theory of material inference. Doctoral dissertation, Vanderbilt University. <https://ir.vanderbilt.edu/bitstream/handle/1803/13551/Dabay.pdf?sequence=1&isAllowed=y>
- DeVries, W. (2014). *Wilfrid sellars*. Routledge.
- Dewey, J. (1938). *Logic. The theory of inquiry*. Henry Holt and Company.
- Hacking, I. (1992). 'Style' for historians and philosophers. *Studies in the History and Philosophy of Science*, A, 23(1), 1–20.
- Henle, J. M., Garfield, J. L., & Tymoczko, T. (2011). *A field guide to modern logic* (2nd ed.). Wiley-Blackwell.
- Hume, D (1902). Enquiries concerning the human understanding and concerning the principles of morals by David Hume, ed. L. A. Selby-Bigge, M.A. 2nd ed. (Oxford: Clarendon Press). [https://oll.libertyfund.org/title/bigge-enquiries-concerning-the-human-understanding-and-concerning-the-principles-of-morals#Hume\\_0222\\_143](https://oll.libertyfund.org/title/bigge-enquiries-concerning-the-human-understanding-and-concerning-the-principles-of-morals#Hume_0222_143)
- Jansen, L., & Strobach, N. (2003). The so-called materially valid inferences and the logic of concepts. *Foundations of the formal sciences II. Applications of mathematical logic in philosophy and linguistics [Trends in Logic]* (pp. 113–118). Kluwer Academic Publishers.
- Jardine, N. (2000). *The scenes of inquiry: On the reality of questions in the sciences*. Oxford University Press.
- Koren, L. (2021). *Practices of reason: fusing the inferentialist and scientific image*. Routledge.
- Lepore, E., & Cumming, S. (2013). *Meaning and argument. An introduction to logic through language* (2nd ed.). Wiley.
- MacFarlane, J. (2010). Pragmatism and inferentialism. In B. Weiss & J. Wanderer (Eds.), *Reading Brandom: On making it explicit* (pp. 81–95). Routledge.
- Marabini, A., & Moretti, L. (2017). Assessing concept possession as an explicit and social practice. *Journal of Philosophy of Education*, 51(4), 801–816.
- Norton, J. (2003). A material theory of induction. *Philosophy of Science*, 70, 647–670.



- Norton, J. (2020). *The material theory of induction*. University of Calgary Press.
- O'Shea J. (2007). *Wilfrid sellars: Naturalism with a normative turn*. Polity.
- Osta Vélez M (2020). *Inference and the structure of concepts*. Dissertation, Ludwig Maximilians Universität, München.
- Peregrin, J. (2014). *Inferentialism: Why rules matter*. Palgrave-Macmillan.
- Richard, R. (1998). *Truth and progress philosophical papers* (Vol. 3). Cambridge University Press.
- Rorty, R. (1991). *Objectivity, relativism, and truth. Philosophical papers* (Vol. 1). Cambridge University Press.
- Sellars, W. (1952). Particulars. *Philosophy and Phenomenological Research*, 13(2), 184–199.
- Sellars, W. (1953). Is there a synthetic a priori? *Philosophy of Science*, 20, 121–138.
- Sellars, W. S. (1956). Empiricism and the philosophy of mind. *Minnesota Studies in the Philosophy of Science*, 1, 253–329.
- Sellars, W. (1958). *Counterfactuals, dispositions, and the causal modalities*. University of Minnesota Press.
- Sellars, W. (2007). *In the space of reasons*. Harvard University Press.
- Stovall, P. (2019). Characterizing generics are material inference tickets: A proof-theoretic analysis. *Inquiry*. <https://doi.org/10.1080/0020174X.2019.1580839>
- Wanderer, J. (2014). *Robert brandom*. Abdington: Acumen
- Watson, J. C., & Arp, R. (2011). *Critical thinking. An introduction to reasoning well*. Continuum.
- Wright, C. (1980). *Wittgenstein on the foundations of mathematics*. Harvard University Press.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.