

Reasoning and Presuppositions

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1. Introduction

It is a platitude that when we reason, we *often* take things for granted, sometimes even justifiably so. The chemist might reason from the fact that a substance turns litmus paper red to that substance being an acid. In so doing, they take for granted, reasonably enough, that this test for acidity is valid. We ordinarily reason from things looking a certain way to their being that way. We take for granted, reasonably enough, that things are as they look.¹

Although it is a platitude that we often take things for granted when we reason—whether justifiably or not—one might think that we do not *have* to. In fact, it is a natural expectation that were we not pressed by time, lack of energy or focus, we could *always* in principle make explicit in the form of premises *every* single presupposition we make in the course of our reasoning. In other words, it is natural to expect it to be true that presuppositionless reasoning is possible:

Presuppositionless: Presuppositionless reasoning is possible.

Presuppositionless is a reassuring thought. It tells us that, at least in ideal circumstances, we can always inspect our reasoning by making explicit one-by-one the considerations upon which our conclusion relies.

So it is not surprising that in analytic philosophy, several prominent philosophers have assumed **Presuppositionless**. Consider Frege (1967:vi):

It cannot be demanded that everything be proved, because that is impossible. But we can require that all propositions used without proof be expressly declared as such, so that we can see distinctly what the whole structure rests upon.

In this passage, Frege endorses the claim that every proposition that in a proof has a bearing for a conclusion could at least in principle be spelled out as a further premise. Along similar lines, Grice (2005) argues that every reasoning can be mapped into an ideal reconstruction that makes explicit every presupposition in it:

Perhaps the most attractive idea is to suppose that we should consider ourselves faced not just with one argument or piece of reasoning (Jill's actual reasoning), but with two, one of which is

¹ I'd like to thank Jim Pryor, Jennifer Carr, Jake Quilty-Dunn, Peter Brössel, Insa Lawler, and all the participants of the Bochum Epistemology Workshop 2019 for helpful discussion on the topics covered in this essay.

actual (Jill’s reasoning) and the other of which is non-actual or ideal (a reconstruction of Jill’s argument incorporating as a premiss the proposition which we are taking her to have had non-explicitly in mind: the former will be informal, the latter formal (and often canonical). Jill’s actual argument will be informally valid just in case there is a legitimate reconstruction of it which is formally valid and which supplements the informal argument with premises which are true (as well as being propositions which, in some sense, Jill has in mind) (Grice 2005:9).

Thus, **Presuppositionless** is both natural and widely assumed. In this essay, I argue that it is false: presuppositionless reasoning is impossible. Indeed, I think this is one of *the* lessons of a long-standing paradox about inference and reasoning known as Lewis Carroll’s (1985) regress of the premises. Many philosophers agree that Carroll’s regress teaches us something foundational about reasoning. I part ways about what it is that it teaches us. What it teaches us is that **Presuppositionless** is false—i.e., that the structure of reasoning is *constitutively* presuppositional.

Here is the roadmap. I start by raising what I shall call the ‘**puzzle of epistemic assessability**’—the puzzle of how reasoning, *qua* mental process, can be epistemically assessable (§2). This discussion will motivate an influential view of reasoning (§3) which notoriously faces the regress challenge (§4). I argue that the prominent responses to the regress challenge—i.e., the “blind reasoning” response, the “rule-following” response and the “non-processual reasoning” response—cannot satisfactorily solve the puzzle of epistemic assessability (§5). Then, I go on to suggest that a satisfactory response to both the regress challenge and the puzzle of epistemic assessability requires recognizing the distinction between input bases and structural bases—a distinction which is independently motivated both by a consideration of the structure of processes in general (§6) and by a closer look at Lewis Carroll’s original regress challenge (§7); the resulting view can solve the puzzle of epistemic assessability (§8) and can be defended against prominent objections (§9). However, it is incompatible with **Presuppositionless** (§10). Therefore, I suggest we adopt it and reject **Presuppositionless** instead.

2. *The puzzle of epistemic assessability*

Reasoning has the superficial grammar of a process. The use of the progressive ‘reasoning’ in e.g., *while reasoning from P to Q, one might realize the falsity of P*, is telling. Indeed, that reasoning is a process is a foundational assumption in the cognitive sciences (e.g. Johnson-Laird 1983; Johnson-Laird & Khemlani 2013). Theoretical reflection might convince us that the superficial grammar of reasoning is misleading—that, in other words, reasoning is not a process and that philosophers of reasoning are after something quite different from cognitive scientists inquiring over the

nature of human reasoning. But barring excellent reasons to think so, the presumption should be that reasoning is a process.²

One remarkable fact about reasoning processes is that they are **epistemically assessable**. Indeed, we can distinguish between at least two dimensions of their epistemic assessability. First, we can assess reasoning for whether or not the premises support the conclusion (call it *Support*). Second, we might assess reasoning for whether the reasoner is on good grounds in drawing the conclusion (call it *Grounds*). *Support* and *grounds* can come apart. As an illustrative example, consider inferring $x^n + y^n$ is not equal to z^n from $x, y, z,$ and n are whole numbers and n is greater than 2 (**Fermat's Theorem**, cf. Boghossian 2011: 227). We know from Fermat's Theorem that the premise supports the conclusion. But one would not be justified in drawing the conclusion if one were unaware of the theorem and with no other reasons to think that the conclusion follows.

What counts as support varies with the kind of reasoning—*deductive support* (or *entailment*) for deductive reasoning, *probabilistic support* for inductive and abductive reasoning, and *counting in favor of* forming an intention for practical reasoning. There are also different kinds of grounds. Just like one's belief might be justified and yet fall short of knowledge, similarly, one's reaching a conclusion can be epistemically off, even though justified. For example, consider Alvin, who is told by George that if John drives a Ford to work, then at least one of Alvin's colleagues owns a Ford. George intentionally fed Alvin with what he thought to be false information. So, when the unaware Alvin sees John drive a Ford, he concludes that somebody in his office drives a Ford. As a matter of fact, this conditional is true, since John only drives a car if he borrows it from Nevi, who is also Alvin's co-worker. And so it is true that if John drives a Ford, then somebody in Alvin's office owns a Ford (**Gettiered Reasoning**). Though the premise supports the conclusion and the reasoning is justified, Alvin is not 'knowledgeable' in drawing the conclusion.

Dimensions of epistemic assessability	Support	Ground
Kinds	Deductive, probabilistic, abductive, practical	Justifiedness, knowledgeability

So, reasoning is epistemically assessable and across different dimensions. Arguably, its epistemic assessability sets it apart from other kinds of mental processes. Consider an unorganized flow of thoughts that one might undergo just before falling asleep. This is also a mental process—and in particular, a *transition of thoughts*—but not

² Some have denied the causal nature of reasoning (Boyle 2011; Valaris 2014) in the light of the regress challenge. I will return to this view later in §5.

one that is epistemically assessable for support or grounds. Or consider the case of a depressive person whose positive thoughts always tend to cause associative negative thoughts (**Depressive Association**, cf. Broome 2013:225). The depressive person is not epistemically blameworthy for reliably associating good thoughts with bad thoughts. Nor does it make much sense to ask whether the depressive person is on good or bad epistemic grounds for making these associations. Thus, not every mental process (or every transition of thoughts) is epistemically assessable. *In virtue of what is reasoning epistemically assessable?*

One tempting answer is that reasoning is not *just* a mental process. Rather, it is, or involves, an *action*—i.e., the action of drawing a conclusion. By contrast, disorganized flows or associations of thoughts are not actions. However, even granting the assumption that paradigmatic cases of reasoning are all actions, their being agentive cannot be the full explanation for why reasoning is epistemically assessable in the way it is. That is so because not *every* action is epistemically assessable. For example, it does not make much sense to ask if I am (epistemically) justified in saying ‘hi’ to a passerby, even though this utterance is an action. Moreover, even when actions *are* epistemically assessable, they are typically (always?) so in virtue of being based on propositional attitudes which are epistemically assessable. So, for example, one’s assertion that it is raining can be justified in virtue of being based on a justified belief about the weather. Indeed, a widespread assumption of the debate about the norms of assertion is that assertions are epistemically proper only if based on epistemically proper propositional attitudes—e.g., knowledge (Williamson 1996) or justified belief (Brown 2010). So, when actions are epistemically assessable, they are so *derivatively*, if at all. By contrast, reasoning seems fundamentally epistemically assessable. *The puzzle of epistemic assessability is to explain in virtue of what reasoning processes are epistemically assessable, and so in what ways reasoning differs from other mental processes that are not epistemically assessable.*

A final clarification is in order. Saying that reasoning is epistemically assessable is not saying that *every* inferential process is epistemically assessable. Rather, it is saying that *paradigmatic cases* of inferences are epistemically assessable. A comparison: not every declarative utterance is epistemically assessable—for example, pretenses and utterances made in a play are not epistemically assessable. By contrast, paradigmatic cases of declarative utterances—i.e., assertions—*are* epistemically assessable. Similarly, some inferential processes might not be epistemically assessable (I will return to this issue in §10), even though paradigmatic cases of reasoning are. An ideal solution to the puzzle of epistemic assessability would explain in virtue of what paradigmatic cases of reasoning are epistemically assessable, and would do so in a way to cast light on why mental processes that closely resemble reasoning are not epistemically assessable.

3. Solving the puzzle of epistemic assessability

Not every view of reasoning as a mental process can vindicate its epistemic assessability. This point has been very vividly pressed by Longino (1978) in an under-discussed paper where she first observed that the puzzle of epistemic assessability arises for the ‘simple causal view’ of reasoning. According to the simple causal view, reasoning from premises to conclusions is simply a causal process where certain premise-thoughts cause a conclusion-thought (Armstrong 1968, p. 194). On the usual understanding of causation, the simple causal view amounts to saying that, if one holds some premise-thoughts, then one cannot but hold the conclusion-thoughts that are caused by those premise-thoughts. But then it is obscure in what sense one might be epistemically off in reaching the conclusion. Thus, the simple causal view makes it utterly mysterious why reasoning is epistemically assessable in the way we have seen it is.

As Longino (1978) observed, the puzzle can be solved if we think of reasoning as a process that involves the so-called taking condition (e.g., Boghossian 2011, p. 79). According to this condition, as usually formulated, a transition from some premise-beliefs to a conclusion-belief counts as inference only if the thinker takes his conclusion to be supported by the presumed truth of those other beliefs. While this standard formulation of the taking condition is rather intuitive, it has the drawback of narrowly applying only to *some* cases of reasoning—those transitions from premise-thoughts to conclusion-thoughts. Of course, however, not every reasoning process has this ‘premise-conclusion’ structure, as in the case of reasoning by *reductio* or by conditional proof (Dogramaci 2016); nor does every reasoning process end with a thought, since sometimes we reason to an *intention or plan*, as in the case of practical reasoning. A more comprehensive formulation of the taking condition is as follows:

Taking condition: A transition of thoughts counts as reasoning only if in it the reasoner takes certain considerations in support of a certain attitude towards a conclusion.

The **Taking Condition** requires the reasoner to take certain considerations in support of a certain attitude towards a conclusion. The relevant attitude does not need to be one of belief, as in the case of practical reasoning; even just focusing on theoretical reasoning, sometimes we reason not to a belief but to the suspension or abandonment of a belief (cf. Harman 1986, Drucker 2021). In this last sort of case, the **Taking Condition** requires that we reason by taking certain considerations to support *the suspension or abandonment of that belief*. A second dimension of generality of the **Taking condition** is that, while ‘the relevant considerations’ are often premises of one’s reasoning, they do not need to be. For **Taking Condition** applies to *all forms of reasoning* (theoretical as well as practical, and deductive as well as inductive or abductive) whatever their structure. When the reasoning has a “Premises, Conclusion” structure, it simply requires taking the premises to support embracing the conclusion. When the reasoning is, say, by *reductio ad absurdum*, it requires taking the fact that a contradiction is derivable from

certain premises to support the denial of those premises; when the reasoning is, say, by conditional proof, it requires taking the fact that a certain conclusion follows from certain premises to support embracing the conditional that if those premises holds then that conclusion holds. When the reasoning is premise-less, as when we just mentally judge a tautology to be true, the reasoning also involves some taking—i.e., taking that tautology to be true by logic (cf. Pavese 2021, section 4.3). And so on. Overall, depending on the structure of reasoning, the considerations that, according to the **Taking Condition**, one ought to take in support of embracing or rejecting a conclusion in order for one to count as reasoning can be different.

By imposing the **Taking Condition**, we can develop the simple causal view into a more complex causal view of reasoning:

Reasoning: S's reasoning is a process whereby S comes to have an attitude towards a conclusion C because of S's taking certain considerations to support that attitude towards C.

According to **Reasoning**, reasoning is a mental process that has a conclusion-attitude as output, and the taking as intermediary; as inputs, it leaves open that one might have premise-attitudes (as in 'premise-conclusion' reasoning) or other pieces of reasoning, as in reasoning by *reductio* or by conditional proof. While often premise-attitudes are beliefs of the reasoner, they do not need to be, as sometimes we reason from credences or partial beliefs; similarly, while often conclusion-attitudes are beliefs, they do not need to be, since sometimes we reason to an intention of the reasoner and in other cases, we reason to the suspension or the abandonment of a belief.

Reasoning affords a simple and clear answer to the question of why reasoning is epistemically assessable in the way it is. The taking is, after all, a propositional attitude and proposition attitudes are the sort of things that can be assessed for grounds: e.g., I might be unjustified in taking the premises to support the conclusions and I might be irrational in doing so; moreover, the taking is a propositional attitude that can be true or false. So if reasoning involves the taking, we would expect it to be epistemically assessed for support as well. Thus, **Reasoning** affords an explanation of the epistemic assessability of reasoning *in terms of* the epistemic assessability of the taking.

While **Reasoning** provides an excellent response to the puzzle of epistemic assessability, it faces the problem of deviant causal chains. Consider Neta's (2013:390) example of Roderick, who on his deathbed thinks back on his otherwise worthless life and finds comfort in the thought that he had at least solved the Gettier problem. But then Tim bursts into his room and proves to Roderick that his solution to the Gettier problem is unsuccessful. Believing that his solution to the Gettier problem is unsuccessful, and also that therefore that his life was worthless, Roderick falls into a state of despair and, out of despair, believes that his life was worthless. In this case, **Reasoning** incorrectly predicts that Roderick has reached his conclusion by reasoning.

The problem arises because, according to **Reasoning**, the relation between the taking condition and reaching a conclusion is causal. In order to overcome this problem, one might instead characterize that relation in terms of *grounding*. Accordingly, Roderick is not reasoning in the example above, as he does not reach the conclusion that his life was worthless *in virtue of* taking the premise (that he did not solve the Gettier problem) to support that conclusion. This discussion motivates the following amendment:

Reasoning grounded: S's reasoning is a process whereby S forms an attitude towards C *in virtue of* S's taking certain considerations to support that attitude towards C.

4. *From the pot to the frying pan*

Reasoning grounded overcomes the problem of deviant causal chains. Yet, it faces the regress challenge (cf. Fumerton 1995; Boghossian 2014, 2016, 2019; Hlobil 2014; Chudnoff 2013; Wright 2014; Broome 2014; Siegel 2016). To illustrate the challenge, consider for simplicity categorically reasoning from P_1, \dots, P_n to a conclusion C, in accordance with **Reasoning grounded**. By an application of the **Taking condition** to this case of categorical reasoning, we get:

(Premise 1: *Taking Condition*): Reasoning from premises P_1, \dots, P_n to a conclusion C requires taking P_1, \dots, P_n to support believing C.

Moreover, **Reasoning grounded** applied to this particular case gives us the second premise:

(Premise 2: *Reasoning as a process*): Reasoning from P_1, \dots, P_n to C in virtue of taking P_1, \dots, P_n to support believing C is a matter of undergoing a process that has the reasoner's beliefs in P_1, \dots, P_n as inputs, the taking as intermediary, and the reasoner's belief in C as output.

But taking P_1, \dots, P_n to support believing C plausibly is or involves a doxastic attitude:

(Premise 3: *Doxastic Construal of the Taking*) Taking that P_1, \dots, P_n support believing C is a doxastic attitude (a belief, or a credence, or a partial belief).

Finally, it seems natural to assume that the taking is playing a similar role in reasoning to that of an attitude towards a premise:

(Premise 4: *Taking as a Premise*) Reasoning to C from P_1, \dots, P_n in virtue of taking that P_1, \dots, P_n support believing C is a matter of reasoning to C from the reasoner's attitudes towards P_1, \dots, P_n and a *further* doxastic attitude towards the premise (P_{n+1}) that P_1, \dots, P_n support believing C.

But according to **Reasoning grounded**, reasoning to C from P1, ..., Pn and from the further premise (Pn+1) that P1, ..., Pn support C amounts to reasoning from one's attitudes towards P1, ..., Pn *and from* Pn+1 to one's attitude towards C by taking it that P1, ..., Pn *and* Pn+1 support believing C. But is not the taking also a doxastic attitude? And if so, isn't that a further premise-attitude? From Premise 1-Premise 4, an infinite regress ensues.

Henceforth, I will refer to this regress as to the "structural regress of the premises," as it arises from considerations having to do with the *structure* of reasoning. The structural regress differs from the *epistemic* regress—or the regress of justification. The latter arises when you ask what *justifies* one in taking that the premises support the conclusion and is triggered by requiring that the justification of the taking be inferential. While the epistemic regress can be stopped by allowing for non-inferentially justified takings (cf. Audi 1986; Dogramaci 2010), that by itself does nothing to stop the structural regress.

The main extant solutions to the regress challenge consist in rejecting either Premise 1, or Premise 2, or Premise 3. In the next section, I argue that these solutions cannot also satisfactorily address the puzzle of epistemic assessability. This discussion will make room in §6 for developing a different kind of solution, one that rejects Premise 4.

5. Extant solutions to the structural regress

5.1 Rejecting Premise 1: *Blind reasoners*

Rejecting Premise 1 amounts to taking reasoning to be *blind*, in the sense that it does not require the reasoner to take the premises to support the conclusion (cf. Wright 2014; Dogramaci 2016; Rosa 2017). As it stands, this move simply sends us back to square one: having gotten rid of the taking, how do we explain the distinctive epistemic assessability of reasoning? Blind reasoning seems to simply forfeit the main theoretical advantage that a taking condition on reasoning affords.

A view of reasoning that dispenses with the taking but that might nonetheless seem to vindicate the idea that reasoning is epistemically assessable has been proposed by McHugh and Way (2018). They propose that reasoning is *a functional kind aiming at fitting attitudes*. This view seems to account for the epistemic assessability of reasoning in terms of whether or not reasoning is performing its function. If reasoning aims at epistemically fitting attitudes, then it must count as epistemically defective when that aim is not reached. This approach to the puzzle of epistemic assessability falls under the general approach of trying to explain the normativity of mental states, processes, or representations in terms of their (selected) functions (e.g., Millikan 1989, Velleman 2015, Neander 2017).

However, at a closer scrutiny, this solution to the puzzle of epistemic assessability falls short of being fully satisfactory. For one would want to know *what it is about*

reasoning that makes it amenable to serve its function. To sharpen this point, consider an analogy: it is a datapoint that beliefs are assessable for truth or falsity, whereas other mental states, such as intentions or desires, are not. Surely, part of the explanation for why beliefs are assessable, and intentions or desires are not, is that the former constitutively aim at certain norms (truth or knowledge), whereas the latter do not aim at those norms. So far, so good. While this goes *some way* towards answering the puzzle of epistemic assessability for beliefs, it falls short of solving it. For one might wonder in virtue of what beliefs *can* aim at truth or knowledge. The full answer might include that beliefs can aim at truth or knowledge because they are the sort of mental states whose content can be true or known; by contrast, other mental states, such as desires, do not aim at truth because they are not the sort of states whose content can be true or known.

Analogously, a satisfactory solution to the puzzle of epistemic assessability would cast light on what it is about the *nature* of reasoning that makes it suitable for it to aim at epistemically fitting attitudes and so to be selected to perform such function. This story will presumably say something about the structure of reasoning that distinguishes it from other transitions of thoughts (such as associations) that instead are not amenable to perform the same epistemic function. Just saying that reasoning aims at fitting attitudes, whereas associations do not, *without saying in virtue of what reasoning transitions are fit to perform that function*, goes only *some way* towards solving the puzzle of epistemic assessability for reasoning. It does not go all the way.

5.2. Rejecting Premise 2: Non-Processual Reasoners

Another response to the regress is to reject Premise 2—the assumption that reasoning is a process of sort (cf. Boyle 2011; Valaris 2014). Perhaps, when we reason, we do not undergo a *process*. Rather, reasoning from P1, ..., Pn to C might simply be a matter of believing C in virtue of believing that P1, ..., Pn support believing C; and one might satisfy this condition without undergoing any process at all. This ‘non-processual view of reasoning’ vindicates the epistemic assessability of reasoning, since it encompasses the taking condition and so it accounts for the epistemic assessability of reasoning in terms of the epistemic assessability of the taking; at the same time it dissolves the regress challenge by rejecting the crucial assumption that reasoning is a process.

Now, there is indeed a sense of reasoning—or *inferring*—that is not processual. As White (1971: 291) observes: “To infer is neither to journey towards, nor to arrive at or be in a certain position; ... Inference is not the passage from *A* to *B*, but the taking of *B* as a result of reflection on *A*.” On the other hand, as Rumfitt (2011:339) points out, we sometimes engage in the task of tracing out the implications of some premises. When we do so, we do it step by step, “taking special care to move only to conclusions that the premisses really imply.” We might call this process *deduction*, rather than inference. Unlike inferences, deductions take time. Unlike inferences, the grammar of deductions (just like the superficial grammar of reasoning) is that of a process. Although Lewis Carroll’s (1895) problem might not arise for reasoning understood as inference, it still

arises for reasoning understood as deduction. In the case of deduction, the suggestion of blocking the regress by rejecting Premise 2 does not apply, since deduction *is* a process. So when it comes to deduction, the proponents of the non-processual view of reasoning cannot at once address the regress challenge and the puzzle of epistemic assessability.

5.3 Rejecting Premise 3: Rule-followers

The final prominent option is to give up Premise 3—the claim that the taking is a propositional attitude. Proponents of this response suggest we retain the taking condition but we do not think of it as a propositional attitude. A prominent alternative proposal is to understand the taking in dispositional terms (Broome 2013; Boghossian 2014). On yet another common proposal, the taking is a representational but not a propositional attitude, for its content is not a proposition but a rule.³

The problem with either proposal is that they risk removing the main advantage of having the taking condition in place—i.e., the solution of the puzzle of epistemic assessability. Start with the dispositional view. Not every disposition is epistemically assessable (consider e.g. dispositions associated with character traits, such as generosity or short temper). So why expect the taking, understood as a disposition, to be epistemically assessable? One might object that the taking is a *special* sort of disposition—i.e., that of following a rule—and that this disposition is of a kind that we can epistemically assess. However, this will not work either, since associative processes also can manifest rule-following dispositions. Consider **Depressive Association**: it happens in accordance with the rule HAPPY THOUGHT → UNHAPPY THOUGHT. Hence, it manifests a disposition to follow a rule but, as we have seen, is not epistemically assessable in the way reasoning processes are.⁴ One might reply that it is the *manifestation* of the rule-following disposition, not the disposition itself, to be epistemically assessable. If anything, however, its being the disposition's manifestation makes the problem only harder, since, as Kripke (1982) taught us, dispositions to follow rules of this sort are not the sort of things that could justify you in acting in the way you are disposed to act (cf. also Wittgenstein 1968: remark 258).

In this respect, the alternative representational non-propositional construal of the taking does not fare any better. On this construal, the taking is representational but not propositional, which is furthermore not grounded on any more fundamental propositional state. Since its content is not propositional, the taking is not the sort of thing that can be epistemically assessed for truth (*Support*), knowledge and justification (*Grounds*); nor can it be derivatively epistemically assessable (in virtue of being grounded on other

³ Gupta (2006) seems to endorse this sort of view of rule-following. See also Chudnoff (2014: 24-31), who proposes that the taking should be modeled as a mental imperative. One objection is that thinking of the taking along the lines of an imperative also faces the puzzle of epistemic assessability, since imperatives are not epistemically assessable for grounds and support.

⁴ Could one respond that the rules relevant to reasoning ought to be rules *of inferences*? This answer presupposes that we already know what reasoning and inferences are, which is what we are trying to explain.

propositional attitudes that are fundamentally epistemically assessable) because by assumption it is not grounded on any other propositional attitude. So, just like the dispositional construal, the non-propositional construal of the taking simply forgoes the main advantage of imposing the taking—that of solving the puzzle of epistemic assessability.

6. *Moving forward*: premise bases *versus* structural bases

Thus far, I have argued that the main responses to the structural regress challenge are not equipped to solve the puzzle of epistemic assessability. No reason for despair: one more premise needs to be granted for the regress to start—i.e., Premise 4. Premise 4 assumes that the taking plays the same role that premise-attitudes play in reasoning. But could the taking be part of reasoning *without* being an extra (implicit or explicit) premise-attitude?

This turns on what it means for an attitude *to be part of reasoning*. A plausible way of understanding it is that, for it to be part of reasoning, the taking ought to figure among the “bases” for reaching the conclusion—the general idea being that something gets to be part of reasoning only if it can figure *among the considerations on the basis of which the conclusion is reached*. If so, then the question of whether the taking can be part of reasoning without being an extra premise-attitude boils down to the question of whether the taking can be among the bases for reaching the conclusion without being an extra premise-attitude.⁵ *Can bases not be premise-attitudes?*

In order to see that bases in reasoning need not be premise-attitudes, it is helpful to compare reasoning to other *kinds of processes*. Consider a simple ball dispenser mechanism and the process that consists in dispensing a ball. The input of the process is the insertion of the ball, and the output of the process is the dispenser dispensing the ball in a certain location and with a certain speed.

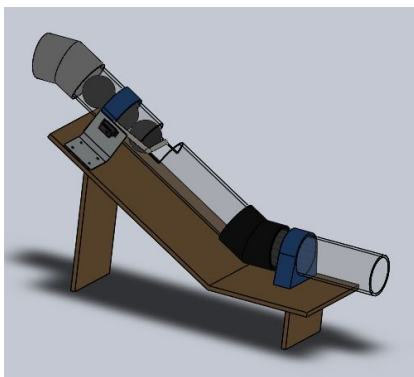


Figure 1: A Ball Dispenser

⁵ On the notion of basis, cf. Neta (2019).

When it comes to explaining the dispenser dispensing a ball with a certain speed and at a certain location, we can distinguish between two kinds of ‘bases’. On one hand, there is the *input* to the process (i.e., a ball being fed at the top of the dispenser). On the other hand, the reason why the ball is dispensed with a certain speed and in a certain location has also to do with the *structure* of the dispenser (its angle, its material, its inclination). The structural features of the dispenser enter essentially in an explanation of the output of the process. Call these structural features ‘**structural bases**’ for the output.

Here is another example. Consider the following process, which takes as inputs full spins of the left wheel (representing certain numbers) and as outputs those of the second wheel (representing numbers that result from multiplying the input by a constant number). For example, let us suppose the process takes full spins as input (say 4 spins) and multiplies it by 2, resulting in 8 full spins.

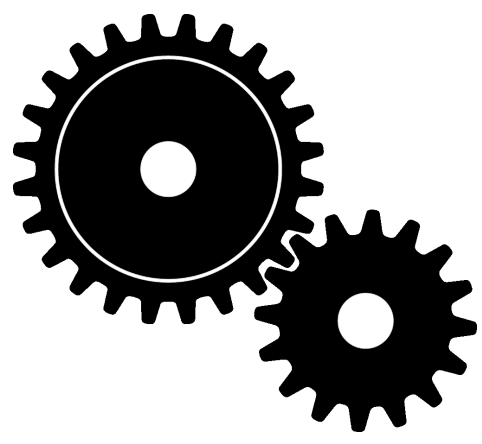


Figure 2: A Constant Multiplier

While the input is a basis for the output (the number of output full spins), the output is determined also by the structure of the constant multiplier (by its being a constant multiplier by 2). Here, the input number of full spins is the **input basis** for the output, the structure of the multiplier is a **structural basis** for the output.

Kinds of bases	Constant multiplying	Action	Reasoning
Input bases	Input number	Intentions, knowledge-how	Premise-attitudes
Structural bases	Multiplying constant	Practical knowledge	Taking

This distinction between input bases and structural bases also holds for processes that are actions. To see this, consider the act of accompanying a ball towards a certain position and at a certain speed. This act has certain inputs (which include, plausibly, an intention, as well as the knowledge of how to do it), an output (the outcome brought about by the action) as well as certain structural features. Different action theorists have different views about what the structural features of an action are but just to mention one, according to some, they include one's practical knowledge of what one is doing (Anscombe 1957).

Reasoning is also a process of sorts. So the distinction between input bases and structural bases applies to it as well. Among its input bases, there are the reasoner's attitudes towards the premises of the reasoning or the reasoner's having reasoned to some preliminary conclusion from certain premises. In addition, just like any process, reasoning has structural bases: facts about its structure that are bases for the reasoner's reaching a certain conclusion. *The claim that the taking can be part of reasoning without being a premise-attitude is the claim that the taking can be among the structural bases of reasoning.*

Accordingly, we might distinguish between two notions of *bases* in reasoning—**input bases** and **structural bases**. Not all reasons need to be input bases for a conclusion. So, not all bases need to be premise-attitudes. Thus, there is no contradiction in the taking being among the bases for the conclusion without it being a premise-attitude, provided that we understand the taking as a structural basis. Hence, there is room for rejecting Premise 4.

So far so good. But why think that the taking does *in fact* play such a different role in reasoning from that of premise-attitudes? There are independent reasons for thinking that the taking can be a structural basis in reasoning. In order to make progress on this question, I suggest we look at the original version of Lewis Carroll's (1895) regress of the premises, which arises in the context of arguments rather than reasoning.

7. Lewis Carroll's regress and the presuppositional structure of arguments.

Lewis Carroll's (1895) original version of the regress arises in the course of an argument between Achilles and the Tortoise that has the following structure. Suppose ϕ and if ϕ then ψ . From that, Achilles would really want to infer ψ . The Tortoise would not allow it: ψ is inferable—she objects—only if if ϕ and if ϕ then ψ then ψ . Then, Achilles is led to suppose, in addition, that if ϕ and if ϕ then ψ then ψ . From that together with the earlier premises, Achilles would want to infer ψ . The Tortoise would not allow it: ψ is inferable—she objects—only if if ϕ and if ϕ then ψ then ψ . No provision of further premises will convince the Tortoise to accept the conclusion. An infinite regress ensues.

When discussing this version of the regress, philosophers tend to agree that the Tortoise is behaving irrationally in not accepting the conclusion. And yet *somehow* she is in position to trigger the regress. An analysis of Lewis Carroll's paradox should explain

what it is about Achilles' argument that enables the Tortoise to trigger the regress. In Pavese (2021), I have argued for a diagnosis of Lewis Carroll's regress that can explain what it is about Achilles' argument that enables the Tortoise to trigger the regress. My diagnosis relies on recognizing that arguments have a *presuppositional structure*. I have argued for this point by showing that argument connectives such as 'therefore' in an argument such as (Argument) work as *presupposition triggers*:

(Argument) Mary is English. Therefore, she is brave.

(Target Content) Mary's being brave follows from Mary's being English.

In particular, in e.g. (Argument), 'therefore' triggers the presupposition that Mary's being brave follows from her being English, expressed by (*Target Content*). Evidence for this claim is that 'therefore' satisfies the usual linguistic tests for presupposition triggers (Pavese 2017; 2021, Kocurek and Pavese 2021, Pavese 2022): projection, not-at-issuedness, resistance to embedding under logical operators (cf. Beaver 2001).

This observation has important consequences for how to understand the speech act of making an argument. For it suggests that this speech act will involve not just asserting (or supposing) the premises and drawing the conclusion; it also will involve the argument giver's presupposing certain entailment relations to hold between the premises and the conclusions. More precisely, one's act of concluding ψ from ϕ will typically presuppose one's *taking ϕ to support embracing ψ* . Thus, the structure of the speech act of giving an argument of this form includes, beyond supposing (or asserting) its premises and drawing its conclusion, the presupposition that one is taking the premises to support the conclusion.

This presupposition is not the same as a *background premise*. Background premises are among the premises that 'therefore' takes as input. These inputs to 'therefore' are not the same as the presuppositions of the act of giving an argument. The presupposition that one is taking e.g., the premises to support believing the conclusion is a *structural presupposition* in that it is constitutive of the structure of the speech act. It is part of the structure of giving an argument without being a (backgrounded or explicit) premise.

Parts of an argument	Characterization
Premise-attitudes	inputs to 'therefore'
Background premise-attitudes	implicit inputs to 'therefore'
Structural presupposition	triggered by 'therefore'

Thinking of the speech act of giving an argument as presupposing the argument giver's taking the premises to support the conclusion suggests the following analysis of the dynamics between Achilles and the Tortoise. The regress arises because at each turn the Tortoise challenges Achilles' presupposing that the conclusion is supported by the premises. By doing so, the structural presupposition is turned into a new premise. But as a new premise is added, arguing to the conclusion from the new set of premises requires a new structural presupposition. The Tortoise challenges it again and so turns it into a premise. Adding that premise alters again the structure of the argument and triggers a new structural presupposition. And so on.

This diagnosis of the regress satisfies the *desideratum* laid out at the outset: the Tortoise is in position to trigger the regress because something is presupposed by Achilles's argument and thus can in turn be challenged by the Tortoise. It also explains why the Tortoise's behavior is uncooperative. It is generally uncooperative to challenge what is presupposed by a speaker if it is something that is known by the participants of the conversation or that it is reasonable for the speaker to expect them to know. But that an instance of *modus ponens* is true is platitudinous and commonly known by competent speakers of English.⁶ That is why at each turn it is uncooperative for the Tortoise to challenge it.⁷

8. Reasoning and Regress

The distinction between premises and structural presuppositions provides a diagnosis of the original version of Lewis Carroll's regress, which arises in the context of an argument between Achilles and the Tortoise. Now, the topic of this essay is *reasoning*, not arguments. Reasoning is not a speech act, though plausibly it is a mental act of sorts (cf. Wu manuscript). Moreover, it is natural to take the structure of arguments to reflect the structure of reasoning. For one thing, arguments can *express* our reasoning. And reasoning can be done *through arguments*, as when mathematicians prove theorems in the public language of mathematics. For that to be possible, the structure of arguments must mirror the structure of reasoning. Moreover, the fact that Carroll's regress arises both in the context of arguments and in the context of reasoning is further evidence that arguments and reasoning are structurally alike. Hence, we should expect the solution to the two versions of the regress to be unified.

⁶Of course, one might further ask *how* it is that competent speakers can know that an instance of *Modus Ponens* is valid. People have defended different answers to this issue (Wright 2001, 2004; Boghossian 2000, 2001, 2003; Dummett 1973, Goldman 1986; Dogramaci 2010). By and large, however, they grant that competent speakers of English can, as a matter of fact, know these sorts of truths.

⁷*En passant*, let me note that this diagnosis of Lewis Carroll's regress provides a natural explanation of Hlobil's (2014: 421) observation that (IMA) sounds Moorean paradoxical in terms of the general observation that presuppositions cannot be canceled if unembedded (cf. Beaver 2001), as evidenced by the weirdness of (X):

(IMA) P; therefore, C. But the inference from P to C is not a good inference (in my context).

(X) It is the doctor who stole the tarts. But nobody did.

Thus, if the structure of the speech act of giving an argument includes the structural presupposition that the premises support the conclusion, then it is plausible that the mental act of reasoning too shares this presuppositional structure. This motivates the thought that the taking may play a role in reasoning akin to that played by structural presuppositions in arguments. Just like structural presuppositions in arguments, the taking is not simply a premise-attitude, nor a backgrounded premise-attitude. For premise-attitudes and backgrounded premise-attitudes are *inputs* to the act of reasoning, rather than structural features of the mental act of reasoning. Presuppositions in reasoning are structural in that they are part of reasoning by being part of its structure rather than being one of its (explicit or implicit) premise-attitudes.

According to this picture, the conclusion of a reasoning is based on *both* the premise-attitudes and the taking. Recall the distinction between input bases and structural bases (§6). While reaching a conclusion is based on the premise-attitudes, it is also *structurally* based on the taking condition. The taking condition is a structural basis in reasoning. Just like structural bases can figure essentially in explanations of outputs of processes, similarly the taking can figure essentially in an explanation of how one has reached a certain conclusion without being an input basis.

Parts of Arguments	Parts of Reasoning	Functional role
Premise-attitudes	Premise-attitudes	Input basis
Background premise-attitudes	Background premise-attitudes	Input basis
Structural presupposition triggered by 'therefore'	Structural Presupposed Taking	Structural basis

This observation provides us with a way of resisting the regress challenge. Recall Premise 4, according to which reasoning to C from P1, ..., Pn in virtue of taking it that P1, ..., Pn support believing C (= REASONING1) is a matter of reasoning to C from the reasoner's attitudes towards P1, ..., Pn and a *further* doxastic attitude towards the premise (Pn+1) that P1, ..., Pn support believing C (= REASONING2). However, if the presuppositional view of reasoning is correct, the structure of these two pieces of reasoning is different in that the latter requires a further taking (that P1, ..., Pn and T support C). So, REASONING1 cannot amount to the same as REASONING2. Having shown Premise 4 to be false, we stop the argument leading to the regress.

One might object that this is too quick. Granted, if the taking plays a role in reasoning similar to that played by structural presuppositions in arguments, then the

regress of the *premises* cannot arise for it. But this still leaves open the possibility that a different sort of regress—a *regress of structural presuppositions*—could arise. As I argue in Pavese (2021), the regress of structural presuppositions is, however, not possible. In order to see this, let us reflect on the nature of presuppositions. Presuppositions differ from premises in that they cannot be directly challenged nor can they be directly picked up by demonstratives and resist embedding under logical operators (cf. Stalnaker 1973, Beaver 2001). As such, it is insulated from embedding under logical operators and so also from being picked up by the taking operator. This renders them “impermeable” to a further application of the taking condition. Hence, neither the regress of the premises nor a regress of presuppositions can start if the taking *stays* presupposed. It will start if one keeps challenging it but only because challenging it “un-presupposes” it—i.e., it turns it into a new premise. The current proposal is that the taking can be presupposed by the structure of reasoning just as structural presuppositions are in the structure of arguments. Hence, because of the structural parallel between arguments and reasoning, the same response against the possibility of a regress of presuppositions applies.

The upshot is the presuppositional view of reasoning. While the presuppositional view of reasoning endorses a taking condition on reasoning, it construes the taking as a structural basis rather than an input basis of reasoning. Specifically, it is a structural basis by being a structural presupposition of the mental act of reasoning. By rejecting Premise 4, the presuppositional view of reasoning can endorse **Reasoning Grounded** without facing the regress challenge. The view is motivated by a unified solution to Lewis Carroll’s regress for arguments and reasoning—a solution that is in turn independently supported by the semantics of arguments.

Others have pointed out that the regress can be stopped if the taking is implicit rather than explicit (cf. Besson 2012, Broome 2013, Boghossian 2019). However, by ‘implicit’, these scholars tend to mean ‘tacit’ or ‘unconscious’. The problem with this way of understanding the taking is that one might *consciously* take the premises to support the conclusion while reasoning without regress. For example, I might reason to Q from accepting P and *if P then Q* in virtue of explicitly (consciously, reflectively, etc.) taking that P and if P then Q support accepting Q, as when I attentively follow up the consequences of my beliefs. If this is correct, it cannot be the taking’s being conscious that triggers the regress. This is predicted on the present view, since structural presuppositions themselves do not need to be tacit or unconscious (although they can be). For example, speakers may be fully aware about what they are presupposing when speaking or when giving an argument. Indeed, the presuppositional view is compatible both with the taking being *conscious*, in the case of active, intentional, and conscious reasoning; and with it being *implicit or unconscious*, in the case of unconscious and unintentional reasoning.

By assigning the taking a structural role to play in reasoning, the presuppositional view can demarcate reasoning from causal transitions that are not reasoning, such as **Depressive Association**. These causal transitions do not count as reasoning because they

do not involve the taking condition—i.e., do not take the input state to support the output state. The presuppositional view of reasoning fares better than its competitors—i.e., the rule-following view of reasoning, the blind view of reasoning, and the non-processual theory of reasoning—because it affords an explanation of the epistemic assessability of reasoning: presuppositions are propositional attitudes that can be true and justified or unjustified. Hence, for example, the view correctly predicts that in **Fermat’s Theorem**, the reasoners might not be justified in reaching their conclusion, because they are not justified in taking the premises to support believing it. It also accounts for justified but non-knowledgeable reasoning (cf. **Gettiered Reasoning**), since presuppositions can be justified but not known.

9 Too demanding?

One prominent objection to any view of reasoning that involves the taking condition is that it is too demanding. Under this general worry, we might distinguish two different challenges. The first is the *over intellectualization challenge*: if taking is part of reasoning, and the taking is a propositional attitude, does not one need to grasp the demanding concepts of e.g., *support* in order to reason? The second challenge is that a doxastic construal of the taking seems too demanding for particular kinds of reasoning—such as *reasoning under uncertainty*—where the taking, if present at all, seems to fall short of a doxastic attitude.

The presuppositional view of reasoning affords a response to both of these outstanding challenges. Start with the first. By capitalizing on the distinction between premise-attitudes and structural presuppositions in reasoning, the proponent of the presuppositional view has at its disposal novel resources to fend off the over intellectualization challenge. That is so because presuppositions are *sui generis* propositional attitudes. They are doxastic in that they are akin to beliefs in being epistemically assessable. Following Lewis (1972), we can think of presuppositions as kinds of beliefs ‘*in sensu diviso*’. More precisely, one believes *in sensu diviso* that p , if one stands in a relation to the proposition that p , understood coarse-grainedly as the set of possible worlds where p is true. But crucially, one might stand in this relation to p even without possessing the concepts that *we as the theorists* use to describe p ’s truth conditions. If the taking is a presupposition and presuppositions are kinds of beliefs *in sensu diviso*, then the taking condition can be satisfied even by less conceptually sophisticated reasoners.

One might nonetheless worry that requiring that whenever one reasons, one ought to possess a doxastic attitude like the taking is unreasonably demanding. Consider engaging in an inference simply for the sake of exploring what follows from what. This process does not need to be epistemically assessable, as it does not need to come with the sort of commitment that characterizes doxastic attitudes. For another example, consider a particular case of *reasoning under uncertainty*, where one successively goes from certain premises to certain conclusions but in such a way that one’s degree of confidence in the

premises supporting the conclusion decreases at each turn. After a sufficiently high number of iterations, one's degree of belief will be so small as to be unrecognizable as full belief. And after an infinite number of iterations, it will approximate zero. In this sort of reasoning, it does not seem plausible that one holds *any* doxastic attitude towards the premises supporting the conclusion.⁸

The response to this objection is that the taking should not always be understood as doxastic. In full generality, it is best understood along the lines of Stalnaker notion of *acceptance* (Stalnaker 2002, p. 715ff). An acceptance is a matter of treating a proposition as true *for certain purposes*—i.e., for the purpose of conversation or for the purpose of exploring consequences of what we already believe or accept. Acceptance is a *broader* class of propositional attitudes that includes but is not exhausted by doxastic attitudes such as beliefs or credences. Suppose the taking is acceptance-like. Then this explains why certain cases of inferences, such as explorative inferences (§2) and certain cases of reasoning under uncertainty, are not epistemically assessable—i.e., because the taking in these cases, though present, is a matter of accepting certain support relations for the purpose of exploring certain consequences, rather than for their presumed truth. Once acceptances are counted among the attitudes that can be part of reasoning, we have the resources for a full solution to the puzzle of epistemic assessability as stated in §2: paradigmatic cases of reasoning are epistemically assessable in so far as their taking is doxastic and so can be epistemic assessable; that does not amount to *every* inferential process being epistemically assessable, since not every inferential process necessarily involves a doxastic taking. In particular, an inferential process will be not epistemically assessable if its taking is an acceptance that is not a belief.

10. Conclusion: *Presuppositionless is false*

How are we to understand reasoning in such a way to vindicate its distinctive epistemic assessability? I labeled this **the puzzle of epistemic assessability**. I believe that the chief motivation for imposing a taking condition on reasoning is that it provides a nice solution to this puzzle. However, the structural regress raises a *prima facie* outstanding challenge for any view of reasoning that involves the taking condition. The most common responses to the regress challenge—i.e., the blind reasoning response, the rule-following response, and the non-processual reasoning response—are not equipped to provide a satisfactory solution to the puzzle of epistemic assessability. My proposed response is that the taking condition plays the role of a structural presupposition in the mental act of reasoning. The resulting presuppositional view is independently motivated by the need of providing a unified solution to the argument-version and to the reasoning-version of Lewis Carroll's regress and by a more general distinction for processes between input bases and structural bases. I argued that the presuppositional view can overcome the regress while retaining all the advantages of **Reasoning Grounded**.

⁸ I thank Jennifer Carr for raising this challenge to me.

We are now in a position to draw the main conclusion of my argument. Recall **Presuppositionless**—the claim that presuppositionless reasoning is possible. If the presuppositional view is correct, however, **Presuppositionless** must be false. For suppose one makes the presupposition in REASONING 1 into a new premise. That will have the effect of altering the structure of REASONING 1. A new piece of reasoning—REASONING 2—comes about, with one more premise-attitude and a new presuppositional structure. Now suppose I make the presupposition in REASONING 2 into a new premise-attitude. A new piece of reasoning—REASONING 3—comes about, with one more premise and a new presuppositional structure. And so on.

This dynamic is well-illustrated by the exchange between the Tortoise and Achilles. What it shows is that the task of turning structural presuppositions into premises is doomed to be endless, since at each turn, doing so will alter but will not nullify the presuppositional structure of reasoning. So at each turn, the result will be a new piece of reasoning, with a new presuppositional structure. If so, then, Lewis Carroll's regress does teach us something foundational about the nature of reasoning. But what it teaches us is neither that we are blind reasoners, nor that we are constitutively rule-followers, nor that we are non-processual reasoners. Rather, it teaches us that as reasoners, we constitutively take things for granted: reasoning (theoretical, practical, deductive, or inductive) is possible only against a set of presuppositions.

References

- Anscombe, GEM. (1957). *Intention*. Oxford: Blackwell.
- Armstrong, D. M. (1968). *A Materialist Theory of Mind* London: Routledge and Kegan Paul.
- Audi, R. (1986). "Belief, Reason, and Inference." *Philosophical Topics*, 14(1), 27–65.
- Beaver, D. (2001). "Presupposition and Assertion in Dynamic Semantics." Stanford: CSLI Publications.
- Besson, C. (2012). "Logical Knowledge and Ordinary Reasoning." *Philosophical studies*, 158(1), 59–82.
- Boghossian, P. (2000). "Knowledge of Logic." In Christopher Peacocke and Paul Boghossian (eds.), *New Essay on the A Priori*. Oxford: Oxford University Press.
- (2001). "How Are Objective Epistemic Reasons Possible?" *Philosophical Studies* 106: 1–40.
- (2003). "Blind Reasoning." *Proceedings of the Aristotelian Society, Supplementary Volume* 77(1): 225–248.
- (2014) "What is Inference?" *Philosophical Studies* 169.1: 1–18.
- (2019). "Inference, Agency and Responsibility." In M. Balcerak-Jackson and B. Balcerak-Jackson, eds., *Reasoning: Essays on Theoretical and Practical Thinking*. Oxford University Press.
- Boyle, M. (2011). "Making up Your Mind and the Activity of Reason." *Philosophers' Imprint*, 11, 1–24.

- Broome, J. (2006). "Reasoning with Preferences?" In Olsaretti 2006: 183–238. Available online at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.366.8014&rep=rep1&type=pdf>.
- (2013). *Rationality through reasoning*. John Wiley & Sons.
- (2014). "Comments on Boghossian." *Philosophical Studies*, 169(1), 19–25.
- Brown, J. (2010). "Knowledge and assertion." *Philosophy and Phenomenological Research*, 81(3), 549–566.
- Carroll, L. (1895). "What the Tortoise said to Achilles." *Mind* 4:278.
- Chudnoff, E. (2013). *Intuition*. Oxford University Press.
- Dogramaci, S. (2010). "Knowledge of Validity" *Nous* 125.499: 889–893.
- (2016). "Reasoning Without Blinders: A Reply to Valaris." *Mind* 125:499: 889–893.
- Drucker, D. (2021). "Reasoning beyond belief acquisition." *Noûs*.
- Frege, G. (1967). *The Basic Laws of Arithmetic: Exposition of the System*. University of California Press.
- Fumerton, R. (1995). *Metaepistemology and Skepticism*. Rowman & Littlefield.
- Goldman, A. (1986). *Epistemology and Cognition*. Cambridge, MA: Harvard University Press.
- Grice, H. P. (2005). *Aspects of reason*. Oxford University Press.
- Gupta, A. (2006). *Empiricism and experience*. Oxford: Oxford University Press.
- Harman, G. (1986). *Change in View*. Cambridge: MIT Press.
- Hlobil, U. (2014). "Against Boghossian, Wright and Broome on Inference." *Philosophical Studies*, 167(2), 419–429.
- Johnson-Laird, P. N. (1983). *Mental models: Towards a cognitive science of language, inference, and consciousness*. No. 6. Harvard University Press.
- Johnson-Laird, P. N., & Khemlani, S. S. (2013). "Toward a Unified Theory of Reasoning." In *Psychology of learning and motivation* (Vol. 59: 1–42). Academic Press.
- Kocurek, A. and C. Pavese (2021) "The Dynamics of Argumentative Discourse" in *Journal of Philosophical Logic*: 1–44.
- Kripke, S. (1982). *Wittgenstein on Rules and Private Language*. Oxford: Blackwell.
- Longino, H. E. (1978). "Inferring." *Philosophy Research Archives*, 4, 17–26.
- McHugh, C., & Way, J. (2018). "What is reasoning?" *Mind*, 127(505), 167–196.
- Millikan, R. G. (1989). "Biosemantics." *The Journal of Philosophy*, 86(6), 281–297.
- Neander, K. (2017). *A mark of the mental: In defense of informational teleosemantics*. MIT Press.
- Neta, R. (2013). "What is an Inference?" *Philosophical Issues* 23.1: 388–407.
- (2019) "The Basing Relation," *The Philosophical Review* 128: 179–217.
- Pavese, C. (2017). "On the Meaning of 'Therefore'" in *Analysis*: 77 (1): 88–97.
- (2021) "Lewis Carroll's Regress and the Presuppositional Structure of Arguments", *Linguistics and Philosophy*:1–38.

- (2022) “The Semantics and Pragmatics of Argumentation” in *Linguistics Meets Philosophy*, edited by Daniel Altshuler, Cambridge University Press.
- Quilty-Dunn, J. and E. Mandelbaum (2018). “Inferential Transitions.” *Australasian Journal of Philosophy* 96.3: 532–547.
- Rosa, L. (2017). “Reasoning without Regress.” *Synthese*: 1–16.
- Rumfitt, I. (2011). “Inference, Deduction, Logic.” In J. Bengson & M. A. Moffett (Eds.), *Knowing how: Essays on knowledge, mind, and action*, Oxford: Oxford University Press: 334–360.
- Siegel, S. (2016). *The rationality of perception*. Oxford University Press.
- Stalnaker, R. (1973). “Presuppositions.” *Journal of Philosophical Logic* 2.4: 447–457.
- (2002). “Common ground.” *Linguistics and philosophy*, 25(5/6), 701–721.
- Valaris, M. (2014). “Reasoning and Regress.” *Mind* 123.489: 101–127.
- (2016). “Supposition and blindness.” *Mind*, 125(499), 895–901.
- Velleman, David (2015). *The Possibility of Practical Reason*, 2nd edition. Ann Arbor, MI: Maize Books.
- White, A. R. (1971). “Inference.” *The Philosophical Quarterly* (1950-), 21(85), 289–302.
- Williamson, T. (1996) “Knowing and Asserting.” *Philosophical Review* 105: 489–523.
- Wittgenstein, L. (1968). *Philosophical investigations*. Oxford: Blackwell.
- Wright, C. (2014). “Comment on Paul Boghossian, “What is Inference”.” *Philosophical Studies* 169(1): 27–37.
- Wu, W. (manuscript) *Movements of the Mind*, Oxford University Press.