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# Fregean Inferences *

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The main aim of this paper is to argue that a Fregean conception of inference is fruitful and well equipped to help us sort out some intriguing philosophical questions. This is interesting because a Fregean conception of inference is quite different from today's standard conception of inference. It is not much attended to, but lends itself to virtue epistemological considerations, a central concern of Pascal.

I focus on two problem areas: The grand aim of making progress in our understanding, or perhaps explanation, of how we can extend our knowledge by inferring, and the equally important aim of understanding practical inference. Progress on either front would in itself be a very significant result. I shall argue that these challenges are related, and that the Fregean approach helps us see that. Seeing them as related is, furthermore, something of a novelty in today's discussion. A subsidiary aim of this paper is to make some progress on how to think about mental acts like judging and inferring, not least with regard to issues which arise when we think of judging and inferring as mental acts, and also think of doing something intentionally as a special way of being related to a propositional content.

The paper will mainly limit itself to the act of inferring deductively. This limitation will not do any harm to my purposes. This kind of act (the act of inferring deductively) might be seen as a challenge for an approach to doing something intentionally that conceives of the latter as the conclusion of

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an inference (a practical inference). I shall explain what this challenge is and respond to it, and in so doing try to show how fruitful such an approach to doing something intentionally is: It can contribute to our understanding of inferring, the distinction between theoretical and practical inference, and perhaps also, more indirectly, to important questions in our conception of the epistemology of logic. When it comes to the latter, however, it would be necessary to extend my focus beyond what I can deal with properly in this article. I shall only touch on issues around validity and logical consequence.

## 1. Setting: Inference and inferring.

Here is an old question recently sharply posed by Dag Prawitz (Prawitz 2013): Why do some inferences confer evidence on their conclusions when applied to premises for which one already has evidence? What is it that gives inferences this epistemic power? This is a fundamental problem, Prawitz claims, and in the literature it has received no obvious solution. One basic problem is that appealing to the relation of logical consequence holding between the premises and the conclusion seems unable to do the job: this relation of logical consequence can hold between premises and conclusion without the subject making the inference displaying the right or even any epistemic sensitivity towards this very fact. Frequently, the answering of this question has been the motivating force behind the development of various types of epistemic account of the meaning of the logical constants (as developed both by Dummett and Prawitz respectively in somewhat different ways), and it has also inspired what we might call inferentialist approaches to meaning (Paul Boghossian (2003) might serve as an example). These positions achieve their aims by building the relevant epistemic sensitivities into the meaning of the logical constants. But not without criticism (see, for instance, T. Williamson 2003 and 2007) and there are, generally speaking, reasons not to accept outright epistemic or inferentialist accounts of both meaning and truth. That being the case, the problem of epistemic transfer in inference presents an interesting challenge.

Frege saw logic as the study of inference, and thought of inference as an act. In contrast, today's standard view sees logic as the study of logical consequence understood as the study of the relationship between propositional contents. Here is how Frege saw inference according to Dag Prawitz:

> An inference in the course of an argument or proof is not an assertion or judgment to the effect that a certain conclusion *B* "fol-

> lows" from a number of premisses $A1, A2, \ldots, A_n$ but is first of all a transition from some assertions (or judgments) to another one. In other words, it contains the $n + 1$ assertions $A1, A2, \ldots, A_n$, and $B$, and in addition, the claim that the assertion $B$ is supported by the assertions $A1, A2, \ldots, A_n$, a claim commonly indicated by words like "then", "hence", or "therefore". ...
>
> This is how Frege saw an inference, as a transition between assertions or judgments. To make an assertion is to use a declarative sentence $A$ with assertive force, which we may indicate by writing $\vdash A$, using the Fregean assertion sign. We may also say with Frege that a sentence $A$ expresses a thought or proposition $p$, while $\vdash A$, the assertion of $A$, is an act in which $p$ is judged to be true. (Prawitz 2013)

What seems very clear is the focus on inference as an act. The premises, the judgings, are also acts, as is the conclusion. Nicholas Smith (Smith 2009) has stressed that for Frege, inference is really a relation between actions. Putting things like that emphasises very strongly the act aspect in Frege. It would, however, be a mistake to think of Frege's inferential transitions as processes in time occurring between entities in time with different temporal extensions and locations. (Ian Rumfitt (2011) defends the view that inferences are not transitions. I cannot here go into his interesting views).

There is also something in the passage by Prawitz quoted above that in my view needs clarification or, probably, reassessment, namely the point that the inference in addition to being a transition "*contains the claim that the assertion B is supported by the assertions* $A1, A2, \ldots, A_n$*, a claim commonly indicated by words like "then", "hence", or "therefore"*" (my italics). This, I think, is a somewhat questionable statement. (Of course, Prawitz is here thinking of inferences of the sort that he calls reflective inferences. [See below for a discussion of this concept.] Still, there remain problems here.)

My view (and, I think, any developed Fregean view), is that an inference might be seen as an act exhibiting a commitment to a correctness claim, but should not be seen *as containing such the claim*. We should take the "because" to alert us to the commitment made, but not as indicating that a claim is made. This point is a delicate one, and I shall return to it below. It relates to, but does not coincide with, Wittgenstein's point that in order to follow a rule we need no rule for how to follow the rule, we only need the rule – and to grasp that following the rule is 'this'. It relates by the same token to points Boghossian makes when he speaks of 'blind reasoning'. The point concerns the relation-

ship between an act of following the rule and reflective knowledge or belief about how to follow the rule that we might have. In the end it concerns the heart of the present debate about knowing how (Stanley 2011).

This point aside, we see that an inference here is seen as a transition from judgment(s) to a judgment; the latter being the conclusion. Both premises and the conclusion are judgments, but the inference itself is precisely not a judgment (for instance to the effect that the conclusion follows from the premises), but the transition from the premises to the conclusion, a transition that in some sense aims to answer to correctness norms. Judgments are, on this picture, constituents of inferences; inferences are not judgments. (There might of course also be judgments about inferences, and about their correctness.)

Frege, or the Fregean, thus sees judgments (represented by the corresponding judgment stroke) as a primitive or special kind of mental act, and also sees the transition in inferences as a primitive or special kind mental act governed by the (normative) laws of thought. For both kinds of mental act there is a question about the relationship to acts characterized as doing something intentionally. That question in turn raises the issue of how we are to think about doing something intentionally, and how our conception of that relates to our conceptions of inference and judgment. I turn now to the subject of doing something intentionally.

## 2. Doing something intentionally.

According to Anscombe (1957), doing something intentionally is at the heart of intentional action, and makes up the starting point for understanding what it is to do something with an intention, or to intend something. It is indeed natural to think of the Anscombian approach to doing something intentionally as a way of being related to a propositional content. She definitely thinks that doing something intentionally can be thought of as a conclusion (of practical inference). This view is also Aristotle's, and Davidson was also willing to entertain it.[1]

[1] Here is Davidson: "In the case of intentional action, at least when the action is of brief duration, nothing seems to stand in the way of an Aristotelian identification of the action with a judgement of a certain kind — an all-out, unconditional judgement that the action is desirable (or has some other positive characteristic). The identification of the action with the conclusion of a piece of practical reasoning is not essential to the view I am endorsing, but the fact that it can be made explains why, in our original account of intentional action, what was needed to relate it to pure intending remained hidden. — In the case of pure intending, I now suggest that the intention simply is an all-out judgement" (Davidson 1980 p. 99).

Now, if our conception of inference is Fregean, a transition between propositional contents to which we relate in the required ways, then we can very simply extend this account of inference into the practical realm as well: if an intentional action is a conclusion of an inference, and also a way of relating to a propositional content, then practical inferences would be inferences with such conclusions, i.e. inferences with conclusions that exhibit this practical way of being related to a propositional content. Frege himself limited his account of inference to inferences in demonstrative science, i.e. theoretical inferences, but it is a very small step, and a step already taken by Aristotle, to think that there are indeed two basic ways of relating to propositional contents in general and thus to the propositional content of a conclusion, namely a practical way and a theoretical way.[2] This practical way of relating to p is exhibited in doing p intentionally. I shall later give more substance to this view.

This move definitely raises the issue, which must be faced, of whether judging and inferring within the context of a Fregean approach to inference should be thought of *as things we do intentionally*. It is a challenging question, and I cannot settle all or even many aspects of it here. This is, however, what I think we should say: inferences are clearly intentional phenomena: they are personal level phenomena (and not sub-personal phenomena), they are clearly things we (i.e. inferrers) do for reasons, but they are not things we typically need to be aware of doing when we do them (as Anscombe argued was the case for all the things we do intentionally). Inferences are unlike intentional actions (things we do intentionally) in their relation to what we might be tempted to think of as the will, as they do not seem to be subject to the same sort of control we normally exercise over things we do intentionally. They are typically responses to many things we do intentionally, like reasoning, deliberating, considering, gathering evidence etc. But, and here is the catch, while we can decide what to do, we cannot decide what to believe of what to infer.[3]

[2] A very natural way of interpreting Anscombe's shopping example is that it shows these two different ways of relating to the same propositional content (the shopping list). The identification of this distinction with a distinction between belief and desire is a big mistake. It probably started with Searle's work on directions of fit.

[3] Of course there are people who argue that forming a belief or making an inference is just as much a utility-maximising choice as any other. I cannot deal with such views here. A prominent example is George Ainslie (Ainslie 1992), but the view is clearly wrong. There is, at this point, a new and interesting exchange between Pascal Engel (2013) and Ernest Sosa (2013) about whether forming a belief can be an action or not. Engel provides arguments against the view that forming a belief is a (possibly intentional) action, an appeals, among other things, to the different kinds of reasons that are relevant in the two cases. I see the crux of the matter addressed in the main text above, and as being about the range of what we can do intentionally. Answering this question

Judging and inferring are not extended in time (as intentional actions are). Many of the aspects pointed out above – like the lack of the standard type of control and also the lack of awareness of being engaged in doing the thing – relate to this point of no temporal extension. (Note that we are aware of deliberating, engaging in reasoning, checking proofs, etc., and that such activities have temporal extensions. We need not, however, be aware of making an inference exactly when we make it, even in cases in which we quickly become aware of having made it.) Judgings and inferrings are typically (i.e. generically) rational responses to the many things we do intentionally when we gather evidence and consider its merit, and deliberate and reason about what we ought to believe or ought to do. (This generic fact about judging and inferring should not, of course, stand in the way of recognizing that we sometimes respond irrationally to evidence, sometimes fall short of judging and inferring the way we should in the light of the evidence we have and the deliberations we have conducted.)

These points together seem to establish that judging and inferring are not necessarily or typically things we do intentionally, even if they are things we do, and they are personal-level intentional phenomena that display reason-sensitivity of as high a degree as any other thing we do. The necessary awareness criterion, argued by Anscombe for intentional action, i.e. our being non-observationally aware of doing what we do intentionally when we engage in doing it, is important for seeing things this way. If we needed to be aware of all the inferences we make in making them, that would be an enormous cognitive burden, and the same goes for judging that things are so and so. The point about control by the will, and that control in these cases of judging and inferring is very different from the normal type of control we have over what we do when doing something intentionally, is related and equally important. Both lack of awareness and lack of control relate to the lack of temporal extension.[4]

negatively does not prevent a notion of teleology to apply to belief and belief formation, at least not when we see belief's point in relation to all these other things we do intentionally. I probably see things differently from Sosa, and, maybe, more the way Engel sees them, but I also recognize the need to go much deeper into this matter. The point about reasons concerns what it is proper to look into, how to conduct an inquiry, and thus about the proper employment of our capacities in forming beliefs.

[4] It might be argued that the way to understand Hume's stance on skepticism, is to understand that we do not with our higher cognitive and reflective capacities control the making of all the judgments we actually make. When a friend knocks on the door and offers a game of backgammon, our reflective skeptical reasoning loses its hold on us. This could not be so if reflective control extended to judgment and inference. Nature has done us an enormous service

## 3. Virtue epistemology and inferring.

The intimate connections between things we do intentionally in terms of considering evidence, reasoning and deliberating, and things like judging and inferring, are sufficient to uphold the possibility of using the type of virtue-theoretic considerations Ernest Sosa (see Sosa 2012) has insisted on in connection with belief-formation (which in this essay is another way of speaking of judging). I find Sosa's approach very useful for thinking generally about epistemic normativity, and very fruitful when it comes to these basic epistemic acts. The standing as acts is very important.

Bluntly put, Sosa's idea is that we should identify three levels of knowledge in ordinary cases of successful belief formation. The basic level we can think of as animal knowledge. Successful belief formation of this sort is *apt*, Sosa says, and that means that it shows real competence in arriving at a true belief in judging. Sosa thinks of possessing this competence as typically exhibiting good reliability in arriving at true belief, but not as reducible to reliability. Here we could also, perhaps, think of competence as providing safety, as Williamson does, and safety as not reducible to reliability. In any case, the next level of belief formation is when belief formation is meta-apt. In that case, the agent or the judger takes into account that the first level competence is intact in the circumstances, that the conditions are appropriate for exercising it, and also assesses the likelihood that the epistemic action from the competence will succeed in the circumstances. Here we have apt reflective intentional activity about first-level belief formation. The third level is that of fully apt, which is when the action on the first-order level is apt *because* it is meta-apt. In that case the agent manifests his/her meta-competence in when and how to exercise their first-order competence when exercising their first-level competence, the competence that is aptly deployed in delivering true belief or judgment. This last third level then exhibits *knowing full well*.

How do these levels identified by Sosa come out when seen in the context of something like Prawitz's concept of a reflective inference? Here is Prawitz on the concept:

> Reflective inferences must be understood as aiming at getting support for the conclusion. This may be articulated in different ways. We may say that the primary aim is to get a good *reason* for the as-

in not letting us (in one sense of us, the reflectively informed will) control all this activity. The distinction in question also relates to Kahneman's distinction between system one and system two.

> sertion that occurs as conclusion. Since the term reason also stands for cause or motive, another and better way to express the same point is to say that the aim is to get adequate *grounds* for assertions or sufficient *evidence* for the truth of asserted sentences. Since assertions are evaluated among other things with respect to the grounds or evidence the speakers have for making them, we may also say that the aim of reflective inferences is to make assertions *justified* or *warranted*. (Prawitz 2013, page 6)

It follows that the point of reflective inference is to arrive at the conclusion with warrant, and that this warrant seems to be provided by the grounds for it, and those are presumably seen at a meta-level where one reflects on the correctness of the inference in question. In that case, the concept of reflective inference will tend to have the same extension as Sosa's knowing full well case, where the first-level aptness is seen as resulting from the meta-aptness. Note that on Sosa's view, knowledge on the first-order level, and the aptness found there, need not result from meta-aptness (i.e. the case of animal knowledge). Such (animal) knowledge should therefore not be accounted for by meta-aptness or reflective knowledge about the correctness of the inference. No such thing needs to be ascribed to a knowing inferrer. I shall employ Sosa's way of thinking about epistemic normativity, noting the connections to Prawitz's as I have just done.

It also seems quite obvious that the three-levelled structure identified by Sosa can be applied just as easily to inferring as to judging. (Sosa himself focuses on judging.) A conclusion is aptly reached when that reaching exhibits or manifests logical competence, a competence to correctly reach such conclusions in a relevant range of inferences. The inference is meta-apt when the inferring person exhibits meta-competence about when to infer and when not to infer, i.e. in the ability to stop inferring in the cases where the competence one has will not succeed. (Again there are connections to Kahneman.) Lastly, we have the cases where the inference is apt because it is meta-apt, where the meta-competence is actively employed and thus plays a real role in the production of an inference that is also apt. The meta-aptness consists both in active reflective knowledge about what good inferences are, accurate knowledge about one's own first-order competence, and active use of this knowledge in influencing the first-order activity.

It is important to distinguish an act such as asserting the correctness of the inference from the act of actually making the inference. It is very easy to think of an inference not as comprising a transition between judgments/assertions,

a transition subject to correctness or incorrectness in its execution, but as the judgment that the connection of logical consequence is in place between the premises and the conclusion. But if we think like that, we lose sight of something fundamentally important regarding the activity of inferring. We might also become subject to a version of the Lewis Carroll regress point; we would never get to the concluding, only to asserting the correctness of the inference, then to asserting the way we established that correctness, and the correctness claim regarding that way of establishing the establishing of the correctness etc. Making an inference thus cannot be making a claim to be asserted, even a correct claim about an implication, but must be to make the transition from premises to conclusion. Making a claim about the correctness of the inference is definitely not part of making the inference aptly, the animal knowledge inference. And there seems to be no good reason to let inferring *contain* the making of such a claim in the reflective case, even if one is prepared to make such a claim, and that knowledge is, so to speak, active. Also, for reflective inference and knowing full well, a sound commitment to correctness seems to be enough for the making of the inference.

Modern logic approaches inference in different ways, but not in this Fregean way where acts of judgment are parts, and inferring is an act. As said above, inference is typically approached as an abstract relation of logical consequence between a set of premises and a conclusion. Both premises and conclusion are then thought of as abstract propositional objects. We might think of the issue here as something like a producing/product ambiguity. One view (the standard view) focuses on the product rather than the producing, while the Fregean focuses on the latter. In any case, the view of inference as a mental act is then lost from the standard view, and the possibility of applying the Sosa apparatus is also lost. And, when this is so, epistemic transfer in inference becomes quite puzzling, something we really need to explain. One great advantage of the Fregean approach to inference, which sees inference as a mental act, is therefore to preserve the applicability of the Sosa virtue-epistemological apparatus, and the possibility of using that apparatus for explanatory purposes, as in the explanation of epistemic transfer. This is part of my motivation for staying fully Fregean.

## 4. Interlude: Some representations of Fregean inferences.

I shall introduce some very simple examples of the Fregean picture in order to communicate more clearly the way I am thinking. I shall use the judgment

stroke and explain the work it is doing in the inference, and index the stroke as to whether it is a normal theoretical judgment we are speaking about, or whether we are speaking about the practical way of being related to a propositional content. In the first case I index with a '*J*' for judgment, in the latter I use a '*P*' for practical. The first is a case of simple modus ponens.

1a. $\vdash_J$ (I am driving to Stockholm)
2a. $\vdash_J$ (If I am driving to Stockholm, I turn left here)
———————
3a. $\vdash_J$ (I turn left here)

What is extra here, compared with the standard way of thinking about inference, is the presence of the indexed judgment stroke. This added level brings with it the possibility that each premise is apt, meta-apt or fully apt, and the same distinction can be applied to the inferring, it can be apt, meta-apt and also fully apt. The first level, that of being apt, carries with it straight knowledge in the case of judging, and the natural way of thinking about the inferring is that when an act of inferring is apt, then if the premises are held aptly, then the conclusion is also aptly held when it is the result of apt employment of some inferential capacity or competence. It is also natural to think that even if the employment of inferential capacity also is meta-apt or fully apt, the conclusion cannot be more than aptly held if the premises are only aptly held but not fully known. On the other hand, it is also natural to think that if the premises are fully apt, then the conclusion can be fully apt, but only as long as the employment of the inferential capacity also is fully apt.

We can therefore see the possibility of thinking about inferences on at least two levels, a ground level which is apt when the premises are aptly held and the inferential capacity is aptly employed, and the case where the meta-capacity is also active and one knows full well in Sosa's sense. We could also introduce the intermediate level if there were a point of doing so. I shall not do so for now.

This example above is deliberatively chosen because we can also use it in a case of practical reasoning. The only difference is in the way we relate to the propositional contents or thoughts, not in the thoughts or the way they relate semantically. Here is the example

1b. $\vdash_P$ (I am driving to Stockholm)
2b. $\vdash_J$ (If I am driving to Stockholm, I turn left here)
———————

3b. $\vdash_P$ (I turn left here)

Most of the things said about apt and meta-apt in the cases of the theoretical inference above carry over to this inference as well. The main difference is that we here have a practical way of relating to one premise, and also to the conclusion. I shall maintain that we need a practical way of relating to a premise in order to get a practical way into the conclusion, and I argue in some detail for this in Gjelsvik 2013 ('Understanding Enkratic Reasoning')[5]. The richness of the Fregean approach becomes even more striking when one considers a practical inference on the model of the theoretical.

Let me make some remarks about aptness in the practical case. First, the practical case as exhibited here is very close to Anscombe's late account of practical inference (in 'Practical Inference', first written for the von Wright volume of Library of Living Philosophers). In fact, or so I shall claim, the '$\vdash_P$' symbol stands exactly for what Anscombe already in "Intention" called *practical knowledge*, something she claimed philosophy had forgotten all about, i.e. a (legitimate and factive) way of being practically related to a content. When you are thus related to a proposition, you are engaged in doing intentionally the propositional content to which you relate. (This is phrased awkwardly, but that should not deter us.) In our example there are two such propositional contents, 'I am driving to Stockholm', and 'I turn left here'. In both cases — the practical premise and the practical conclusion — we take the whole premise to represent an intentional action. I say more about this practical stroke in other connections. I also agree with Anscombe that being so related to a propositional content, i.e. 'I am driving to Stockholm', implies awareness of me being engaged in driving to Stockholm. This awareness is a way of knowing that I am driving to Stockholm. Doing something intentionally carries non-observational knowledge of what you are engaged in doing with it. This knowledge is propositional.

There are further issues here concerning the point that an intentional action exemplifies knowledge how to do the thing in question. Such knowledge must be employed with success for the intentional action to be there. We get further layers when we consider whether the action is apt, whether it is also meta-apt, and apt because it is meta-apt. I shall not here take a stand on how to think about knowing how to x, and I want at this point to remain neutral on the contested and controversial questions about the relationship between knowledge how to something and knowledge that.[6]

[5] Jay Wallace made a good case for this in Wallace 2001.

[6] Jason Stanley (2011) is an important new contribution I shall not engage with here.

Intellectualists, philosophers who advocate the reduction of knowledge how to do something to knowledge that, operate with practical ways of being related to constituents of propositions or thoughts. That is, however, not the same as the practical way of being related to a whole proposition about which I am speaking. As I said, I will not be going into issues about knowledge how to do something, just stress the need to operate with a practical way of being related to whole propositions when thinking about doing something intentionally. This point shows some of the complexities in the relationship between Anscombe's use of practical knowledge and the discussion about Ryle's distinction between knowing how to do something and knowing that. (As discussed in Stanley 2011.)

Let me close with some further examples of a theoretical and a parallel practical inference, before going on to show how enkratic inference can be dealt with on the present approach. The first example is interesting because it shows how to extend the practical way of relating to a proposition to the case of intentions. There are no conditional actions, but there are conditional intentions. The central case, the case of doing something intentionally, thus needs to be extended to intentions and conditional intentions. A great deal of practical reasoning, as Michael Bratman has shown, concerns plans within plans, and relations between intentions. Without discussing all of that, I shall just provide the example with intentions.

4a. $\vdash_J$ (If I ought to take a break, then I shall take a break)

5a. $\vdash_J$ (I ought to take a break now)

———————————

6a. $\vdash_J$ (I shall take a break now)

The practical analogue to this must be reasoning between two intentions, which is shown by the way 'shall' enters the actual content. We still represent the reasoning in the same way as that of action:

4b. $\vdash_P$ (If I ought to take a break, then I shall take a break)

5b. $\vdash_J$ (I ought to take a break now)

———————————

6b. $\vdash_P$ (I shall take a break now)

The enkratic case is Broome's case in which you move by inference from the recognition that you ought to take a break to an intention to take a break (see

Broome 2013.) '$B$' stands for belief by this rendering of Broome's approach, and has a parallel, but not a full parallel in the judgement stroke on my approach. The '$I$' stands for intention on Broome's approach, and has a parallel but not a full parallel in the practical stroke on my approach. I use the letters in this way for comparative purposes; I don't think it causes any problems. (I use the strokes to indicate legitimate ways of being related to propositions.)

This is the practical inference according to Broome:

2. $B$(I ought to take a break)

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3. $I$(I shall take a break)

(To be precise: On Broome's view this reasoning is enthymematic: I also need to believe that it is up to me whether I take a break or not. The full and correct representation of the inference is something like this:

2. $B$(I ought to take a break)

2*. $B$(It is up to me whether or not I take a break.)

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3. $I$(I shall take a break))

On the view I am pursuing, this is not correct reasoning, and Broome is wrong. There is a logical step from the modal verb 'ought' to the modal verb 'shall' which is not correct inference – satisfying the one modal predicate does not entail satisfying the other.

This is the correct practical inference on my view:

1. $\vdash_P$ (If I ought to take a break then I shall take a break)
2. $\vdash_J$ (I ought to take a break)
3. $\vdash_P$ (I shall take a break)

Without the first premise being true of you, you will not reach the conclusion. Note, it is not enough for you to judge the first premise to be true, you have to have adopted the practical way of relating to the first premise to be able to infer this conclusion. If you only judge the propositional content of first premise to be true, but do not relate to it practically, then you might exhibit akrasia or weak will in this case. This shows that weak will is not typically a failure of reasoning (as it would be on Broome's account), but also why

we need a practical way of relating to a premise in order to get a practical conclusion.

This demonstrates the ability of the present neo-Fregean approach to practical inference to handle some of the most contested issues in today's discussion of practical inference. And there is more here: dominant in the discussion has been the role of rationality requirements in practical inference, their form, whether they are wide in scope or narrow, and so forth.[7] I submit from the perspective of the present approach to inference that we have all the resources we need in the ways of relating to propositional content, and there is no point in going into the issue of rationality requirements. Or rather, all the work that can be done by rationality requirements will be done by the resources we already have at our disposition, by what goes into the legitimate ways of relating to propositional content, practical and theoretical.

Work is also done by the interaction between judging and inferring, and the recognition that inferential connections may force us to reconsider some of the judgings to which we are committed: if a conclusion of a valid inference must be rejected, we must reject at least one premise. That goes for both theoretical and practical inference. The great virtue of the present approach is the way we get a full parallel between practical and theoretical inference in this matter, and a full parallel in the way entailment relations matter. This was indeed Anscombe's Aristotelian aim.[8] If we were to extend the present approach to hypothetical thinking, then we might as an additional benefit be able to see the structure of reduction arguments as fully parallel and as arising out of some hypothetical premises leading to unacceptable conclusions. Of course, we engage in such reasoning all the time. Any full approach to inference needs to deal with that. I return to this kind of extension in the concluding overview, but just let me say that I want to remain neutral on *how* to extend to hypothetical judgments, and that from the present perspective we start from the categorical in both the theoretical and the practical case. The extension to the hypothetical may take quite different forms in the two cases.

This concludes the discussion of enkratic inference. Let me end by appending one further point. Keeping the practical case in view makes it easy to see how difficult it is to think of inferring as something we do intentionally.

[7] There is now a huge literature on this topic. Important early contributors are Broome and Kolodny.

[8] If we were to extend the present approach to hypothetical thinking since we might benefit further by being able to see the structure of reduction arguments as fully parallel and as arising out of some hypothetical premises leading to unacceptable conclusions. Of course, we engage in such reasoning all the time. Any full approach to inference needs to deal with that.

If we do, it will result in a vicious regress in the practical case: If we think of inferring as a way of being practically related to a propositional content, as we would be if the action was intentional, then that intentional action of inferring should also be able to be a conclusion of another practical inference, and so forth. We get an analogue to the Lewis Carroll problem. The problem is not solved as long as you think of the transition as something we do intentionally, and think of doing something intentionally along the present lines.

## 5. Returning to the theoretical case: Discussion of Prawitz's explanation.

Prawitz formulates the explanation we are seeking of the transfer of epistemic value as an explanation of how some inferences come to be legitimate, conceived in this case as inferences that confer evidence on a conclusion when there is evidence for the premises. Prawitz supplies this explanation at what he calls the level of generic inference. The notion of legitimate inference goes then like this:

> In sum, it is required of a proof that all its inferences are successful. To characterize a proof as a chain of inferences, as we usually do, we thus need this notion of successful inference. It is convenient to have a term for this, that is, for inferences that can be used legitimately in a proof, and I have called them legitimate inferences (Prawitz 2011). Accordingly, a generic inference is said to be legitimate, if a subject who makes the inference and has evidence for its premisses thereby gets evidence for the conclusion; or more precisely, it should follow that she has evidence for the conclusion from the assumptions that she performs the inference and has evidence for the premisses. We can now say that a deductive proof is a chain of legitimate inferences.

We see that the starting point here is that of successful inference in relation to producing a proof. On the Frege–Sosa approach, we might think of the notion of success such that a successful inference extends our knowledge. This is because we start from inferences where we judge/assert the premises, successful judgment is knowledge, and the rule of assertion can be seen as 'assert only what you know'. Proof in the case of an inference will then typically play a role in knowing full well that knowledge has been extended in making the inference.

There is a big difference between this way of simply speaking about knowledge and the extension of knowledge, and speaking of the conferring of evidence on the conclusion. These differences may have some of their background in whether one's thought is structured by the tripartite analysis of knowledge, or whether knowledge is not to be analysed into three parts. It also has a background in the extension of the role of asserting in Prawitz's approach. Prawitz extends asserting from judging something to be so, or assert correctly, to simply assuming a propositional content to be correct. In Prawitz's revised terminology, an assumed premise is also an assertion. With that move, he departs in a quite specific way from the basic Fregean picture of inference. That departure has its clear motivation, and that motivation needs to be addressed; for now, however, let it just be duly noted. The result is that while the old fashioned Fregean considers inferences that basically extend our empirical or mathematical knowledge, and I in this paper extend that old Fregean picture of inference to commonsense knowledge and also to practical knowledge (in Anscombe's sense), Prawitz generalizes in a different direction by thinking of assumptions as assertions, moving swiftly in fact from categorical judgments to hypothetical ones. Inference can then take place between assumptions, not only between legitimate judgments, and this may well suit logic. I am not extending in this way to assumptions and to hypothetical judgments. I hold that we should deal with those extensions as a special or derivative case to be properly considered in due course in both the practical and theoretical case: our basic business is inferential competence.

With this noted, here is some of what Prawitz says to explain the transfer of evidence in legitimate inferences:

> If we pay attention to the agent who performs an inference and the occasion at which it is performed, we are considering an *individual* inference act. By abstracting from the agent and the occasion, as we usually do in logic, we get a *generic* inference act.

He formulates the required explanation at the level of generic inference thus identified. *How* we abstract will, however, matter as well. The issue can be formulated as being about what we do when we abstract 'from the agent and the occasion'. Should we abstract in such a way that we can still keep all the Sosa distinctions properly in place or not? To a virtue epistemologist it is necessary to keep the various competences of the inferring agents properly in view when we abstract. I therefore answer my own question affirmatively, but cannot see that Prawitz abstracts in such way as would be required by such conditions

on the abstraction. That is, it seems to me, related to his abstracting not from inferences where we go from actual legitimate judgments to a conclusion, but from inferences where we start from assumptions (assertions/judgments) in the extended sense. I suggest we should abstain from moving to assumptions (assertions in the extended sense), and only generalize on well-functioning epistemic agents performing old-fashioned Fregean inferential acts successfully, inferential acts on actual judgments or actual premises.

To show that this might matter, let me introduce Prawitz's explanation of how an inference comes to be legitimate:

> We can spell out what it is show that a condition *C* on generic inferences is sufficient for legitimacy as the task of establishing for any generic inference *I* and subject *S* that from the three facts
> (1) the inference *I* satisfies the condition *C*,
> (2) the subject *S* has evidence for the premisses of *I*,
> (3) *S* performs *I*,
> it can be derived that (4) *S* gets evidence for the conclusion of *I*.
>
> To find such a derivation is the business of the philosopher who seeks an explanation. This may be described as taking place on a meta-level, where the subject's activities on the object-level is explained. The subject is not to do anything except performing the inference *I*; the point is that thereby, without doing anything else, she gets evidence for the conclusion.

Here we have a subject S who performs an inference, and not much more is said about the relevant dimensions in epistemic normativity that are exemplified by the subject S in performing that inferential act. This is where we seem to go different ways. From my perspective the great advantage of the Fregean way of thinking about inference is precisely the way we can theorize about competences and abilities of the person doing the inferring when approaching issues like that of transfer of knowledge. This applies both to the competences of the subject in question in making each premise legitimate, and the competences of the subject in making the legitimate inferential transition. I contend, therefore, that all abstractions we make when explaining legitimate inferences should respect and acknowledge the normative epistemic distinctions Sosa identifies. We should bring in the competences of the inferring subject, the aptness and meta-aptness displayed by the inferring person when doing the inferential transition, and use such resources in explaining the transfer of epistemic properties in inference. And note: the successful employment of

these competences seems to match the extension of the *explanandum*, i.e. when knowledge *is* extended in inferring, and the problem that the explanation provided explains epistemic transfer when there is no transfer disappears. There is, possibly, therefore, disagreement about how to conceive of the shape of explanation of what I think of as getting knowledge extended by inference.

There are also, of course, different ways of thinking about the explanation provided. Timothy Williamson (Williamson 2009) has recently attempted to explain the extension of knowledge by logical competence when we move from premises to conclusion. That explanandum is close to the explanandum I focus on, but not the same. This is because I want only to explain that we extend knowledge when employing logical competence in successful/legitimate inferences. Williamson wants to explain that such inferences *are* successful, even if the probability of the truth of the conclusion is lower than the truth of each premise separately. My explanandum presupposes my Fregean framework, and starts from legitimate premises, as identified above, and aims to explain *how* epistemic standing of the premises is being transferred to the conclusion *when* it is transferred (and I say by logical competence). I am not explaining *that it is* transferred. Williamson has a stronger aim than me: he wants to explain *that* epistemic properties *are* transferred by logical competence. There is, of course, an issue of transfer of legitimate ways of relating to a propositional content or a thought that I am not discussing, and an issue of the relationship between taking oneself to know and actually knowing. Some of these issues have been discussed under the heading of rationality requirements. These issues need addressing, but not here, and there will be different challenges in the practical and the theoretical ways of relating to contents.[9]

It also seems to me that what goes into Prawitz's condition C above will vary a lot on whether we are explaining transfer of knowing full well, or just transfer of (animal) knowledge. For instance, knowing that the conclusion follows from the premises by knowing how to see the last step of the inference as accounted for by introduction rules and reduction to canonical form, might

[9] My assumption is that all premises are legitimate. Of course in real life the probability that all premises in a deduction are legitimate will be lower than the probability that a particular premise is legitimate, and lower than the probability that the premise with the lowest probability of being legitimate is legitimate. Williamson's project is to show that safety does not work the way probability does, that the conclusion might still be safe, and that safety is what matters for knowledge. That is an extremely interesting project. But I am simply assuming that the premises are legitimate, and that we know each premise. I believe this example shows advantages of the Fregean approach in how to conceptualize the issues, but cannot go further into that.

plausibly be a way of knowing the conclusion full well, but it does not seem required for explaining anything on the part of the subject S if the transfer of knowledge when inferring is not meta-apt. In that case, the ascription of simple logical competence is enough to explain transfer of knowledge.

There is a further point concerning the notion of evidence, and the extent to which one's thinking is coloured or structured by the way one thinks of the relationship between knowledge and evidence. If one accepts a traditional tripartite account of knowledge, and sees knowledge as justified (or evidence-based) true belief, then things looks quite different from when one does not accept that analysis, and thinks of knowledge as too central a concept to be subjected to analysis, and, moreover, thinks that our evidence is simply what we know. On this way of thinking, the Fregean conception of inference is a natural ally, and we can think of successful inference simply as extending our knowledge. We will no longer, it seems to me, have to pose the question of the transfer of evidence in quite the same way as Prawitz.

Let me add one further consideration here. Prawitz goes on to provide an extremely elegant proof. He shows how we can introduce a language of grounds such that he can prove that a subject who performs a valid inference also then obtains evidence for the conclusion, in an externalist sense of evidence (in the sense of being related to a truth-maker). Here is Prawitz again:

> The proposed explication according to which a subject who makes a valid inference gets to know a truth-maker of the sentence asserted by the conclusion, *although she may not know that it is a truth-maker of the sentence*, seems therefore optimal with respect to what a subject can become aware of and get to know by just performing an inference. (my italics)

The difficulty — or rather the limitation — in this as I see it, is that we do not from this account seem able to explain how the correct inference makes the right room for the subject's making the judgment that the conclusion represents. Without any awareness of the fact that the truth-maker is a truth-maker for the conclusion, the subject might have evidence for the conclusion without having any awareness of having evidence for the conclusion. If the explanation were a somewhat simpler one (simpler on the present conception), namely that of explaining that the conclusion is known, then the explanation would only need to appeal to competence at extending our knowledge, and one could say quite simply that the (known) premises make up the evidence for the conclusion. If the explanation would have to account for a *separate*

transfer of evidence seen as necessary for knowledge, the task is different, and possibly much harder. What we wanted explained at first was, I think, the transfer of the epistemic value of the premises such that if we knew the premises we knew the conclusion. The issue now is about achieving that aim through a transfer of evidence from the premises to the conclusion. If we think of inference ultimately as the transfer of knowledge, and we here seem only to be able to transfer grounds for knowledge, (externalistically conceived grounds), without transfer of any awareness that the grounds are grounds, then we seem to fail in our ambition to explain that the inferrer knows the conclusion.

On the other hand, I think Prawitz's reasoning is completely correct at every step given his starting points. But what I am insisting on is that we start in a completely different place; the explanation we seek should focus, I suggest, on the competence exhibited by the inferring person in the individual inference acts, not on the properties of the generic inference as conceived by Prawitz.

This is a point where it might be useful to bring in the practical case once more. In practical inference there is also a transfer of something, but can it be evidence? That seems to be altogether wrong in the practical case. If we have to bring in the practical case, and we do it seems to me, then we're in trouble. It cannot be accommodated by Prawitz's way of thinking. Still, the practical case seems to exhibit exactly the same logical competence as the theoretical. Further, if we think of these skills or competences just as skills we use to extend our knowledge, there is space for the possibility that the knowledge extended can be either type of knowledge, theoretical or practical. Bringing in the practical therefore broadens our view of inference, something I consider a great advantage. It is an advantage of the Fregean view that it seems ideally suited for such a broadening.

This broadening move, someone might think, might not in the end be entirely defensible. Of course, that is up for further discussion. Thinking as I suggest does, however, change the ground on which we stand when we look at how the inferring agent employs their inferential skills and competences. It avoids, at least initially, any commitment to a specific type of meaning theory in explaining the epistemic transfer. On the suggested view, all successful inference extends knowledge, and the same competence/skill is employed in extending both practical and theoretical knowledge.

## 6. Concluding overview

By bringing in both the practical and the theoretical, we are able to identify a general way of looking at legitimate inferences that is of great theoretical interest, and which brings unity to the basic types of inference: they are both knowledge-extending when they are legitimate. They extend practical and theoretical knowledge respectively.

Such inferences can fail in two ways: we can fail in the inference being correct, and we can fail in the way we relate to a premise, as our relating to that premise might not be legitimate. Legitimacy therefore crops up twice on this Fregean view, and provides a unique way of thinking about inferences. In the last type of case, the case where our relating to a premise is not legitimate, the factivity of the premise will break down, and we, in the theoretical version, will entertain something false or something that is true by luck, and in the practical case something we take ourselves to be doing something we will fail to do. This is so even if the inference would have been legitimate had the premises been legitimate.

In the practical case, then, we fall back on intention in doing it, and we say that that is what I intended to do. In the theoretical case we fall back on belief. Just as belief is then seen as failed (theoretical) knowledge, intention (in this sense of intention, i.e. intention in doing something when we fail to do it) is seen as failed (practical) knowledge. There is luck in the theoretical case, where our belief happens to be true by some fluke. Not so in the case of doing something intentionally. The practical case is, however, different in another way. There is also prior intention, intention prior to the act when, for instance, a temporal gap obtains between the forming of an intention and acting, and there is the deviant case where you happen to do the thing because of the intention you have but you do not do it intentionally.

The practical case highlights the need to ponder whether we should think of inferring as an intentional action. I highlight the point because the conclusion is itself an intentional action in the central practical case. I submit that we should not think of inferring as an intentional action, and that going wrong here shows us one of the ways we might be led to posit a Lewis Carroll type conclusion. This point does not stand in the way of recognizing many intentional actions in the neighbourhood, like engaging in reasoning, deliberating, considering evidence, considering whether something follows etc.

The paper has not attempted to explain what logical competence is, nor to explain what logical correctness is, nor what it is to know logical truths, nor to know that some inference is valid and the conclusion a logical consequence of

the premises. It is not committed to a specific view about how to extend from categorical judgments to hypothetical ones, only to the view that we should think of the basic logical competence as displayed in categorical judgments and intentional actions. Of course, we can do the abstraction Prawitz does and think of the premises simply as assumptions, not as Fregean judgments in the theoretical case. In that scenario, we may be well placed for focusing on whether something *is* a logical consequence of something else, and we might reach a judgment about that. Reaching such judgments is something logic perceived as a discipline does. We reach that judgment by employing logical competence, and we can employ the result to extend and improve our logical competence. We do something similar in reductio arguments, where the focus is different from doing logic; it is to explore the tenability of some assumption.

There is, as pointed out by Dummett, no real justification of deduction, but a sort of explanation. Prawitz's proof that there will be truth-makers for the conclusion in the case of a correct inference from legitimate premises can be put to use in this explanation. I do not want to commit to truth-makers in any metaphysical sense, but bringing in truth-makers (rather than evidence) can be extended to cover both practical and theoretical inference. We only need to think of truth-makers in the right (metaphysically innocent) way.

This paper must remain largely neutral on how we think in more detail about logical knowledge and logical competence and the relationship between them. But the paper does impose some constraints on the theoretical work. It must provide a view on what validity is, a view of logical competence such that we can on the whole see people as inferring correctly and competently in an interesting range of cases. If Prawitz's proof or a Bolzano-Tarski approach can be seen as doing the first part of this, then we can think of the ways of breaking down complex logical steps into simple ones as exhibiting the possibility of there being logical competence among finite beings. Those things together will help explain how there could be such a thing as logical competence. In actual inference, then, for there to be transfer of epistemic value there has to be an employment of this sort of competence, a competence that is generally accounted for on the theoretical level. The important point is that there are different explanations at different levels. That makes the tasks achievable, and also makes them semi-independent, which in its turn changes the dialectical situation

It is hard to see how the work that is needed on this theoretical or meta-level can be further constrained than by making the connections between the explanatory levels possible. When that work is done, we are in a position to understand whether knowledge can be extended by inference in the range of

cases so depicted. Of course, logical competence can vary between individuals, from dogs to logicians, and some individuals are much better at extending their knowledge than others. Also, there is no need to be able to account for an extension of knowledge when the inference is too complex for the skills the inferrer in question possesses. The competence of an actual inferrer can be determined by identifying the kinds of inference the inferrer in question knows how to perform.

From this perspective, a division of labour obtains between explaining on the one side how an actual inferrer can extend knowledge by inference, and, on the other, how inference in general can extend knowledge. The explanations are quite different. The latter question is dealt with by work in logic and logical theory while the former is dealt with by looking at the competence of an individual inferrer. The one question focuses on inference generally conceived and in the abstract, the other on actual inferrings, and can employ virtue epistemology. As I see things, the Fregean conception of inference is exemplified in the latter, and it helps us separate the two, and by separating the explanatory tasks, progress on very difficult questions is made.

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