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Inferential Soundness

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In this paper I register a complaint against what I call the standard view of inferential soundness. The complaint invokes the idea of an inference claim, with which I begin.

An argument claims that its premise(s) support its conclusions. I call a claim to this effect an inference claim. Thus an argument makes an inference claim. (I shall allow myself this harmless anthropomorphism; strictly speaking it is arguers who make inference claims, not arguments.)

Of course an argument does not assert in so many words that its premise(s) support its conclusion. But it makes a claim to this effect if it employs a logical indicator. For example:

> (A) John looks tired. So he must have been partying.

By means of the logical indicators 'so' and 'must' this argument claims that its premise (John looks tired) supports its conclusion (John was partying). The logical indicators make this claim elliptically. The claim expresses part of what they mean.

The inference claim made by (A) is explicit because the logical indicators are explicit. But an argument without an explicit logical indicator still makes an inference claim. The claim is implicit. For even such an argument claims—implicitly—that its premise(s) support its conclusion. Otherwise it would not be an argument.

Inference claims differ in strength. For example the inference claim made by (A) is stronger than the inference claim made by

> (B) John looks tired. So he was probably partying.

Argument (A) claims that its premise shows that its conclusion *must* be true, while argument (B) makes the weaker claim that its premise shows that its conclusion is *probably* true. (Here I am of course assuming that 'probably' in (B) is a logical indicator connecting the premise to the conclusion. But suppose that 'probably' is treated as part of the conclusion. Then (B)'s inference claim is the same as (A)'s: it is to the effect that the argument's premise shows that the conclusion (John was probably partying) must be true.[1] Thus if 'probably' is treated as a logical indicator connecting the premise to the conclusion, then (2)'s inference claim is weaker, and its conclusion stronger, than if 'probably' is considered part of the conclusion.)

The strength of an explicit inference claim may be indicated by the logical indicator(s) used to make the claim. Consider the following groups of expressions, which are, or may be used as, logical indicators:

(a) implies that, entails that, shows conclusively that;

(b) highly probable, highly likely, it follows with practical certainty that;

(c) probably, likely, tends to show that;

(d) may, might, possibly, implies that (in the colloquial sense of "suggests that" or something similar).

The expressions in Group (a) are deductive indicators. The use of one of these indicators (in an argument) indicates a deductive argument, by which I mean an argument that claims to be valid (a valid argument being one whose conclusion must be true if its premise(s) are true). This is the strongest inference claim an argument can make. The expressions in Groups (b)-(d), when used as logical indicators, are nondeductive indicators. The use of such an in-

dicator (in an argument) indicates a non-deductive argument—an argument that does not claim to be valid but makes a weaker claim. Thus an inference claim made by means of any of the expressions in Group (b) is weaker than one made by any of the expressions in Group (a). But it is stronger than one that might be made by means of an expression in Group (c); and an inference claim made by means of any of the expressions in Group (c) is, in turn, stronger than one that might be made by means of an expression in Group (d).

An argument which uses a Group-(a) indicator (or any other deductive indicator) thereby claims that its premise(s) provide *conclusive* support for its conclusion. An argument which uses as a logical indicator a Group-(b) expression or an expression equivalent in force thereby claims that its premise(s) provide *strong* support for its conclusion, while an argument which uses a Group-(c) or equivalent expression (or a Group-(d) or equivalent expression) thereby claims that its premise(s) provide *moderate* (or *weak*) support for its conclusion.

Now it is widely held that one of the requirements an argument must meet if it is to be a (logically) good argument is that its inference should be sound (or correct). As this requirement is standardly interpreted, an argument has a sound inference if and only if its premise(s) and conclusion are soundly connected. This is what I call the standard view of inferential soundness.

It is agreed that an argument's premise(s) and conclusion are soundly connected if

(i) the premise(s) necessitate the conclusion.

It is also agreed that this is not a necessary condition. But what further condition(s) is (are) sufficient is a matter of dispute.

Here, for example, are two rival candidates:

(ii) the premise(s), if true, make the conclusion probable;

(ii*) the premise(s), if true, make the conclusion probable "in the absence of other evidence".[2]

To (i) and (ii)-or-(ii*) some philosophers would add the following condition or one like it:

(iii) "The premise(s), if true, would provide, in the absence of other considerations, separately relevant and jointly supportive reason(s) for accepting the conclusion".[3]

An adherent of the standard view of inferential soundness will endorse *some* set of criteria for determining whether an argument's premise(s) and conclusion are soundly connected and will hold that an argument has a sound inference if and only if it satisfies at least one of the criteria in the set. Thus he or she will hold that the set's criteria for determining whether an argument's premise(s) and conclusion are soundly connected are *ipso facto* criteria for determining whether an argument's inference is sound.

Suppose that we endorse the standard view of inferential soundness and that our set of criteria for determining whether an argument's premise(s) and conclusion are soundly connected (and hence for determining whether an argument's inference is sound) includes (i), (ii*), (iii), and no other criterion. Suppose next that we have an argument whose premises and conclusion are not soundly connected under any of these criteria but which does not claim that they are. I have in mind, for example, an argument whose premises and conclusion are connected by the logical indicator 'so it may be that' (which means that it does not claim to satisfy criteria (i) or (ii*)) and which does not claim to satisfy criterion (iii) either, perhaps because it is not the sort of argument—a 'balance-of-considerations' argument—to which (iii) applies. What the argument claims is that its premises provide weak support for its conclusion. Suppose this claim is true: the premises *do* provide weak support for the conclusion. Then the

argument's inference claim is correct. But we shall judge that its inference is unsound. For its premises and conclusion are not soundly connected by any of our three criteria, and we regard these as the criteria of inferential soundness. Since we shall judge that the argument has an unsound inference we shall conclude that it is not a good argument if we hold that a good argument has a sound inference. But taken on its own terms, as it were, the argument as so far describd appears perfectly satisfactory. It is careful not to claim that its conclusion is more strongly supported by its premises than it actually is; rather the degree of support that the premises confer upon the conclusion is precisely the degree that the argument claims they confer. How then can the argument be justly accused of committing a mistake in reasoning? Surely it cannot. Yet it is accused of committing such a mistake if it is accused of having an unsound inference—as it must be if its inference is assessed in terms of our set of criteria.

If we are inclined to agree that the argument does not really commit a mistake in reasoning we might contemplate adding to the set the criterion that an argument's premise(s) and conclusion are soundly connected if the premise(s) provide weak support for the conclusion. But this will not do. For if an argument's premise(s) provide (only) weak support for its conclusion, they are *not* soundly connected to the conclusion. An argument's premise(s) are not soundly connected to its conclusion unless they provide for the conclusion support sufficient to justify acceptance of the conclusion, at least in the absence of further evidence or other considerations. And premises do not provide such support for a conclusion if they support it only weakly.

This argument suggests a condition for the acceptability of a criterion for determining whether an argument's premise(s) and conclusion are soundly connected: such a criterion is acceptable only if it is not the case that under the criterion premises are soundly connected to a conclusion for which they provide only weak support.[4] But if this is so then it is not because our criteria of inferential soundness are unreasonably strict that we are compelled to accuse our argument of having an unsound inference. Rather it is because we accept the standard view of inferential soundness and therefore regard our criteria as criteria for determining whether an argument's inference is sound just because they are criteria for determining whether an argument's premise(s) and conclusion are soundly connected. No matter what our criteria were for determining whether an argument's premise(s) and conclusion are soundly connected, if they satisfied the acceptability condition just stated we would have to accuse the argument of having an unsound inference as long as we accepted the standard view of inferential soundness.

If we wanted to resist making this accusation, what moves might we consider? I think there are several. One, to which I shall give special attention, is to abandon the standard view of inferential soundness, and therewith our criteria of inferential soundness, for a criterion which connects the idea of inferential soundness to the idea of an inference claim, as the following does:

> An argument's inference is sound if and only if the argument's inference claim is true.

Unlike the standard view of inferential soundness, this criterion (which I shall call the inference-claim criterion) does not maintain that an argument's inference is sound if and only if the argument's premise(s) and conclusion are soundly connected. Nevertheless it permits the view that an argument's premise(s) and conclusion may be (or fail to be) soundly connected. What it does not permit, but requires us to reject, is the view that criteria for determining whether an argument's premise(s) and conclusion are soundly connected are *ipso facto* criteria for determining whether an argument's inference is sound.

It is agreed, we said, that an argument's premise(s) and conclusion are soundly connected if the premise(s) necessitate the conclusion. Under the inference-claim criterion it is not sufficient for an argument's inference to be sound that its premise(s) necessitate its conclusion. But it is *necessary* that they do so if the argument is deductive. For if the argument is deductive, it *claims* that its premise(s) necessitate its conclusion, and its inference is not sound under the inference-claim criterion unless this claim is true.

If an argument is deductive, it claims to provide a particular degree of support—viz. conclusive support—for its conclusion. But not every argument claims to provide a particular degree of support for its conclusion, and this poses a difficulty for the inference-claim criterion. There are two cases I shall consider.

First, an argument may employ what I shall call a neutral logical indicator—a logical indicator whose use by an argument does not by itself indicate that the argument is claiming to provide a particular degree of support (weak, moderate, strong or conclusive) for its conclusion, though it does of course indicate that the argument is making the more general claim that its premise(s) support its conclusion. The following terms, when used as logical indicators, are neutral indicators, 'therefore', 'so', 'thus', 'hence', 'then', 'for', 'since', 'because'. An argument may of course employ a logical indicator which combines one of these terms with a non-neutral term so that the indicator itself is not neutral: 'therefore probably' is a case in point. But suppose that an argument's logical indicator *is* neutral: in the absence of other evidence, on what basis, if any, can we attribute to the argument an inference claim more specific than the general claim that its premise(s) support its conclusion? And if we cannot attribute to the argument an inference claim more specific than this, then any argument with a neutral logical indicator will have a sound inference under the inference-claim criterion if its premise(s) support its conclusion, even if the support that the premise(s) provide is only very weak. But then, it will be said, the criterion is intolerably lax: for it allows an argument whose premise(s) provide only very weak support for its conclusion to have a sound inference even if the argument does not explicitly claim that the premise(s) support the conclusion only very weakly and thus even if, for all we know, the arguer would claim (falsely) that the argument provides moderate (or strong or conclusive) support for the conclusion.

The same problem may arise if an argument has no (explicit) logical indicator at all, which is my second case. Of course in such a case (as in the case of an argument with a neutral logical indicator) it may still be possible to tell what degree of support the argument claims to provide for its conclusion: contextual data may tell us or the argument may have a readily discernible logical form that tells us (e.g. it may be a conditional argument that affirms the antecedent, hence an argument which we may assume claims to be valid because its validity is obvious). But in the absence of such evidence, how can we attribute to the argument an inference claim more specific than the claim that its premise(s) support its conclusion?

To cover these cases, an adherent of the inference-claim criterion might propose the following rule:

> (1) If an argument employs a neutral logical indicator or no logical indicator, then, barring a balance of evidence to the contrary, assume that it claims to provide the degree of support for its conclusion that it actually does provide if and only if this is greater than nil; if it is nil, then attribute to the argument only the claim that its premise(s) support its conclusion.

(A balance of evidence to the contrary exists if there is evidence to the contrary and if there is not equally strong or stronger

evidence that the argument claims to provide the degree of support for its conclusion that it actually does provide.)

If for example an argument is valid, (1) instructs us to assume that the argument claims that its premise(s) necessitate its conclusion, unless there is a balance of (contextual) evidence that the arguer wishes to make a weaker claim. If on the other hand an argument is not valid but there is a balance of contextual evidence that the arguer wishes to claim it is, then (1) instructs us to regard *this* as the argument's inference claim.

Suppose that in the case of an argument with no logical indicator or a neutral logical indicator we decide that there is no way of telling what degree of support the argument claims for its conclusion except by following the procedure (1) entitles us to follow in such a case, namely deciding what degree of support the argument actually does provide for its conclusion. Suppose further that it is apparent upon inspection that the argument's premise(s) do support its conclusion (to some as-yet-undetermined degree). Then (1) together with the inference-claim criterion allow us to decide straightaway that the argument's inference is sound. We can make this decision in such a case *without* determining what degree of support the argument provides for its conclusion. This is obviously an unwelcome result. The trouble is that (1) is excessively charitable. Consider the following argument:

(C) These two rabbits have short tails.
So all rabbits have short tails.

The premise of this argument provides (extremely) weak support for the conclusion. According to (1) we should assume that the argument makes this very claim itself—that it claims to provide (extremely) weak support for its conclusion. But for all we know the arguer may have been so wrongheaded as to think that the premise strongly supports the conclusion. Certainly the argument's logical indicator does not rule out this possibility. To assume that the argument really only claims to provide (extremely) weak support for its conclusion may, for all we know, be to reconstruct the argument (so that it has a true inference claim) rather than to identify the (perhaps absurd) inference claim that the arguer actually had in mind. And why should we be so charitable as to do this?

(1) will not do. But consider:

> (2) If an argument employs a neutral logical indicator or no logical indicator, then, barring a balance of evidence to the contrary, assume that it claims that its premise(s) and conclusion are soundly connected.

Given an argument with a neutral logical indicator or no logical indicator, if there is a balance of contextual evidence that the argument claims to provide only weak support for its conclusion, then under (2) we should regard this as the argument's inference claim. If on the other hand there is no evidence that the argument does not mean to claim that its premise(s) and conclusion are soundly connected, then under (2) we should assume that it means to claim that they are, even if the premise(s) provide only weak support for the conclusion (in which case the argument's inference claim is false and so, under the inference-claim criterion, the argument's inference is unsound).

Suppose we decide under (2) that a particular argument with a neutral logical indicator or no logical indicator claims that its premise(s) and conclusion are soundly connected, because there is not a balance of evidence to the contrary. To decide whether the argument's inference is sound under the inference-claim criterion we would need criteria for determining whether an argument's premise(s) and conclusion are soundly connected and we would have to decide which of these criteria to apply to the argument at hand. In these respects our position would be no different from what it is if we hold the standard view of inferen-

tial soundness. Moreover we might employ precisely those criteria for determining whether an argument's premises and conclusion are soundly connected that we already employ if we hold that view. In deciding which of the criteria to apply to the argument at hand, we would presumably ask which of them it is most reasonable to assume the argument claims to satisfy (or which of them it is most reasonable to believe the arguer would claim it satisfies). And here we could allow ourselves to be guided by the same considerations that already guide us if we hold the standard view of inferential soundness. (For example, we could allow ourselves to be guided by our argument-classification scheme. Thus if we classified the argument as analogical we would be free (so far as (2) and the inference-claim criterion are concerned) to suppose that the argument claims (or that the arguer would claim) that the premise(s) and conclusion are soundly connected by the criterion (or criteria) we deem appropriate for determining whether the premise(s) and conclusion of an analogical argument are soundly connected.)

But is (2) a reasonable rule? Is it reasonable to assume, barring a balance of evidence to the contrary, that an argument with a neutral logical indicator or no logical indicator claims that its premise(s) and conclusion are soundly connected? I think it is, because I think that whether we realize it or not (and we may not if we are uninstructed in logic) *to argue is to make this claim*, unless the arguer indicates otherwise. If one argues one thereby claims that one's premise(s) and conclusion are soundly connected by *some* criterion (that meets the acceptability condition we stated earlier)—unless one indicates otherwise. (But it is precisely because it is possible to indicate otherwise that we are questioning the standard view of inferential soundness.)

If this generalization about what it is to argue shows that (2) is reasonable, then we may generalize (2) as:

> (3) Barring a balance of evidence to the contrary, assume that an argument claims that its premise(s) and conclusion are soundly connected.

Evidence to the contrary exists if (for example) an argument claims by its choice of logical indicator that its premise(s) provide only weak support for its conclusion. Does evidence to the contrary also exist if an argument claims by its choice of logical indicator that its premise(s) provide *moderate* support for its conclusion? An adherent of (3) might take the view that this depends upon whether premises that *do* provide moderate support for a conclusion are soundly connected to the conclusion. If they are (the adherent of (3) might hold) then evidence to the contrary does not exist; rather the argument should be understood as claiming that its premise(s) and conclusion are soundly connected.

It will not always be clear, however, whether there does exist evidence (or a balance of evidence) that an argument does not claim that its premise(s) and conclusion are soundly connected. An argument's logical indicator may point in one direction, contextual data in another. Or an argument may employ a vague logical indicator—for example, one which does not make it clear whether the argument is claiming to provide weak support or moderate support for its conclusion. If we were to accept (3) and the inference-claim criterion, we might decide on charitable grounds to be lenient in such cases and, if there is reason to think that an argument intends to make an inference claim other than the claim that its premise(s) and conclusion are soundly connected, attribute this different claim to the argument if the claim is true, so that the argument's inference will be sound under the inference-claim criterion. Alternatively we might decide to assume that an argument is claiming that its premise(s) and conclusion are soundly connected unless it *is* clear that it is not—on the ground that if an arguer does not mean to make this claim

he or she has the obligation (in our view) to indicate this clearly.

An adherent of the inference-claim criterion would require a rule or set of rules for deciding what inference claim to attribute to an argument which does not indicate that it is making an inference claim more specific than the claim that its premise(s) support its conclusion. I believe that (3)—which I shall hereafter call the inference-claim rule—is adequate for this purpose.

I wish to consider next David Hitchcock's point that "for psychological reasons, a person may claim a stronger or weaker link than actually exists" between premise(s) and conclusion.[5]

Imagine an argument whose premises necessitate its conclusion but which claims (non-ironically) only that they make the conclusion very probable. If we accept the standard view of inferential soundness, we will not hesitate to say that the argument has a sound inference (precisely because the premises necessitate the conclusion), regardless of the fact that the argument claims differently. If however we accept the inference-claim criterion as our criterion of inferential soundness, we must say that the inference is unsound on the ground that the argument's inference claim is false: the claim underestimates the argument's strength. And this will strike an adherent of the standard view of inferential soundness as a decisive objection to the inference-claim criterion. For to say that an argument has an unsound inference and is therefore a bad argument just because the arguer has underestimated the argument's strength is—on the standard view—absurd.[6] On the other hand, if you underestimate the strength of an argument that you make (by, for example, claiming that your premises make your conclusion very probable when in fact they necessitate it), then you make a mistake—indeed a logical mistake, a mistake in reasoning. It is not obvious to me that your mistake should not be thought to render your inference unsound, just as a proponent of the inference-claim criterion would maintain. But a compromise position is conceivable. For in claiming that your premises make your conclusion very probable, you mean that they make it *no less than* and *no more than* very probable. And this claim is half right (as well as half wrong), your premises *do* make your conclusion no less than very probable (still assuming that they necessitate it). So we might say that your inference is *semi*-sound (or semi-*un*sound). But the inference-claim criterion does not allow us to say that an inference is semi-sound. So if we wanted to accept that criterion but not reject as completely unsound the inferences of arguments that underestimate their strength, we would have to add to the criterion a clause that provided for such cases, giving us (for example):

> (4) An argument's inference is sound if and only if the argument's inference claim is true. The inference is semi-sound if and only if the argument's inference claim underestimates the support that the premise(s) provide for the conclusion.

(I shall call this the *enriched* inference-claim criterion.)

What about an argument that *over*estimates its strength? For example, an argument which claims that its premises make its conclusion very probable when in fact they make it barely more likely to be true than not? If we accept the standard view of inferential soundness we will say that the mistake the argument makes in overestimating its strength has no bearing upon whether its inference is sound. But if we accept the inference-claim criterion or the enriched inference-claim criterion we will say that the mistake makes the argument's inference unsound.

To recapitulate. If we accept the standard view of inferential soundness, we shall have to say that an argument which provides (only) weak support for its conclusion has an unsound inference. But if an argument

claims to provide only weak support for its conclusion, it is not just to accuse it of having an unsound inference. To make this accusation is to fail to evaluate the argument's reasoning on its own terms. If we wanted to avoid accusing the argument of having an unsound inference, we might abandon the standard view of inferential soundness in favour of one of the inference-claim criteria canvassed here (together with the inference-claim rule). But this would not be the only move available to us. I shall conclude by briefly considering three others.

(a) We might discard the very idea of inferential soundness and, following Stephen Thomas, replace it by the notion of degrees of support.[7] On this approach, to evaluate an argument's inference is to decide what degree of support (nil, weak, moderate, strong, conclusive) the argument's premise(s) provide for its conclusion. But consider an argument whose premises provide weak support for it. This claim—the argument's inference claim—is false. Hence the arguer's reasoning is flawed: he or she has misjudged the strength of the grounds given for the conclusion. But the mistake is not captured by an assessment of the argument's inference that takes the 'degrees of support' approach. This is because to take this approach is in this case not to evaluate the argument's reasoning on its own terms. Thus there is no necessary connection between taking this approach and evaluating an argument's reasoning on its own terms. (To take the 'degrees of support' approach is to evaluate an argument's reasoning on its own terms only if the degree of support that the argument claims to provide for its conclusion is the degree it actually does provide.) Hence the approach is open to the same sort of objection I raised against the standard view of inferential soundness.

(b) The argument we imagined for the purpose of making that objection employed the logical indicator 'so it may be that' to connect its premises to its conclusion. But suppose we detach the phrase 'it may be that' from the logical indicator and transfer it to the conclusion so that the logical indicator is now 'so' and the conclusion reads 'it may be that...'. The argument's premises may now be soundly connected to the conclusion, in which case if we accept the standard view of inferential soundness we will judge that the argument has a sound inference. Moreover in making this judgment we will not be failing to evaluate the argument's reasoning on its own terms. For under the inference-claim rule the reinterpreted argument claims that its premises and conclusion are soundly connected.

Now a phrase that on one interpretation is used as a logical indicator and that, so interpreted, has a neutral component and a non-neutral component can be analyzed instead as a phrase that is used as a neutral logical indicator plus a phrase that is a conclusion-component. (For example, the phrase 'so it may be that' may be interpreted as a logical indicator with the neutral component 'so' and the non-neutral component 'it may be that' or as the neutral logical indicator 'so' plus the conclusion-component 'it may be that'.) Suppose we were to stipulate that such a phrase should always be so analyzed—as a neutral logical indicator plus a conclusion-component. Would the standard view of inferential soundness then be immune to the objection raised against it here? Not entirely, I think. For imagine an argument with a neutral logical indicator whose premises and conclusion are not soundly connected. On the standard view of inferential soundness the argument has an unsound inference. But there might be (a balance of) clear contextual evidence that in the arguer's view the premises provide only weak support for the conclusion. If on the strength of that evidence we took this to be the agument's inference claim, and if the claim were true, we would be disinclined to say that the argument, taken on its own terms, had made a mistake in reasoning. And so we would still be inclined to object to the standard view

of inferential soundness.

(c) We might then be moved to adopt the following position: whether an argument's inference is sound depends upon whether its premise(s) and conclusion are soundly connected unless it is clear that the argument does not claim they are, in which case its inference is sound if and only if its inference claim is true. This position is not significantly different, however, from the conjunction of the inference-claim criterion and the inference-claim rule. And if we add to it the clause that an argument which does not claim that its premise(s) and conclusion are soundly connected is semi-sound if and only if it underestimates its strength, the resulting position is not significantly different from the conjunction of the *enriched* inference-claim criterion and the inference-claim rule. But it is significantly different from the standard view of inferential soundness. For its does not imply that in order to decide whether an argument has a sound inference it is always sufficient just to decide whether its premise(s) and conclusion are soundly connected.

Notes

[1] Here I make two assumptions. (1) Standardized (with tacit premises supplied) the argument is this:

a. If a person looks tired and conditions C obtain, then he or she was probably partying.
b. John is a person.
2. John was probably partying.
1. John looks tired.
c. Conditions C obtain.

(2) Because this argument is obviously valid (by *modus ponens*) it means to *claim* to be valid.

[2] David Hitchcock, *Critical Thinking: A Guide to Evaluating Information*, Methuen, Toronto, 1983, p. 107. (Cited below as *Critical Thinking*.)

[3] *Ibid.*

[4] Criterion (iii) is not worded in such a way as to ensure that it meets this condition. But it would be if 'sufficient' were substituted for 'supportive' (assuming that premises which provide only weak support for a conclusion do not provide support sufficient to justify accepting it).

[5] *Critical Thinking*, p. 109.

[6] Cf. *Critical Thinking*, p. 109.

[7] Stephen N. Thomas, *Practical Reasoning in Natural Language*, Second Edition, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1981, Chapter 2.

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