Erkenntnis (2006)
DOI 10.1007/s10670-006-9002-5

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SHUTTING DRETSKE'S DOOR

ABSTRACT. Dretske proposes a theory of knowledge in terms of a theory of information, but wishes to deny that empirical knowledge settles the large question of scepticism. This leads him to deny the closure of knowledge under known entailment. In a recent paper Jäger argues that Dretske's theory of information *entails* closure for knowledge, 'at least for the kind of propositions here at issue' (Jäger 2004:194). If Jäger is right, Dretske is seriously embarrassed and must give something up. In this paper I show that there are two flaws in Jäger's argument. The principle of informational closure considered by Jäger is incompatible with Dretske's theory of information, and Jäger's argument that Dretske is committed to a certain kind of substitution instance of that principle of informational closure is invalid. I propose adequacy conditions on signalled information and use them to motivate a formulation of a general closure principle for signalled information. I show that Dretske's account of information satisfies the adequacy conditions, but in a way which commits him to an instance of the general closure principle. I argue that Dretske is consequently committed to closure for some cases of knowledge for which he wishes to deny closure. Finally, I sketch how, on the basis of the closure principle to which Dretske is committed, Jäger's broader argument may yet go through.

Dretske proposes a theory of knowledge in terms of a theory of information, but wishes to deny that empirical knowledge settles the large question of scepticism. This leads him to deny the closure of knowledge under known entailment. In a recent paper Jäger argues that Dretske's theory of information *entails* closure for knowledge, 'at least for the kind of propositions here at issue' (Jäger 2004:194). If Jäger is right, Dretske is seriously embarrassed and must give something up.

In this paper, I shall show that there are two flaws in Jäger's argument. The principle of informational closure considered by Jäger is incompatible with Dretske's theory of information, and Jäger's argument that Dretske is committed to a certain kind of substitution instance of that principle of informational closure is invalid.

I shall then propose adequacy conditions on signalled information and use them to motivate a formulation of a general closure

principle for signalled information. I shall show that Dretske's account of information satisfies the adequacy conditions, but in a way which commits him to an instance of the general closure principle. I shall argue that Dretske is consequently committed to closure for some cases of knowledge for which he wishes to deny closure. Finally, I shall sketch how, on the basis of the closure principle to which Dretske is committed, Jäger's broader argument may yet go through.

1. FIRST FLAW

Jäger's argument goes by way of the claim that Dretske's theory of information is closed under known entailment. Jäger's intention is to show that Dretske is committed to closure for knowledge because Dretske is committed to the following closure principle for information:

(PIC) If r carries, relative to the subject ... the information that p, and [he] knows that p entails q, then r carries, relative to [him], the information that q. (Jäger 2004:192)

Dretske defines a signal's informational content like this: given your background knowledge, k,

a signal, r, carries the information that x is F = The conditional probability of x's being F, given r (and k), is 1 (but given k alone, less than 1). (Dretske 1983:106)[1]

Consequently, if we interpret PIC in terms of Dretske's theory of information we get

PIC Dretske If $P(p|r \wedge k) = 1$ and $P(p|k) < 1$ and you know that p entails q, then $P(q|r \wedge k) = 1$ and $P(q|k) < 1$

But this is false as the following counterexample demonstrates.

Let 'p' be 'E' and 'q' be '$E \vee F$', and let '$E \vee F$' be a conjunct of k. Clearly p entails q and we assume the subject knows it. Let $P(p|r \wedge k) = 1$ and $P(p|k) < 1$. When the antecedent of *PIC Dretske* is thus satisfied, its consequent is false because the second conjunct is false. $P(q|k) = 1$ because q, being a conjunct of k, is entailed by k. So *PIC Dretske* is necessarily false. Clearly, such counterexamples can be constructed whenever a proposition you know to be entailed by a proposition you are informed of is also entailed by your background knowledge.

Since Dretske's theory of information is not incoherent, and yet interpreting PIC in his terms results in a necessary falsehood, Dretske cannot be committed to PIC and his theory is incompatible with PIC.

So Dretske's information is not closed in accordance with PIC and Jäger's argument cannot go through on that basis.

2. SECOND FLAW

Jäger says 'Let *e* stand...for some empirical proposition... and let not-*h* represent an appropriate [negation of a] skeptical hypothesis'. He then attempts to show that 'instantiation of the above closure principle (PIC) is *true*':

(PIC*) If $P(e|r \,\&\, k) = 1$ & $P(e|k) < 1$, and [the subject knows $e \models$ not-h], then $P(\text{not-}h|r\&k) = 1$ & $P(\text{not-}h|k) < 1$. (Jäger 2004:192)

First of all, PIC* is a substitution instance of *PIC Dretske* (above), which we now know to be false. The second flaw in Jäger's argument is that he has not shown PIC* to be true. A necessary condition on showing PIC* to be true is to show that $P(\text{not-}h|k) < 1$ follows from the antecedent or is necessarily true, and Jäger has done neither.

Jäger does not attempt to derive $P(\text{not-}h|k) < 1$ from the antecedent: in fact it cannot be shown to follow from the antecedent alone just because $P(\text{not-}h|k) = 1$ is (generally) compatible with the antecedent. Jäger offers independent reasons for the truth of $P(\text{not-}h|k) < 1$:

"Skepticism", we even hear him saying "is true" (Dretske 2004, p. 174). ...by this, I take it, he does not mean to say that skeptical hypotheses are actually true, but rather that the skeptic is right in claiming that we are not entitled to be certain that they are false....The assumption, in other words, is that (given what we know about the world) the probability of skeptical hypotheses being true is not zero.... So from Dretske's epistemology we get ... $P(\text{not-}h|k) < 1$' (Jäger 2004:193)

Suppose Jäger reads Dretske aright when he reads Dretske as intending to be committed to $P(\text{not-}h|k) < 1$ for some k. Nevertheless, that does not suffice. $P(\text{not-}h|k) < 1$ must be shown to be necessarily true, or at least, Dretske must be shown to be committed to its necessary truth. Jäger has not argued to that effect. Furthermore, $P(\text{not-}h|k) < 1$ being *necessarily* true means PIC* is necessarily *false*. $P(\text{not-}h|k) < 1$ being necessarily true means that for any H, $P(\text{not-}h|H) < 1$, which implies that $P(\text{not-}h|r \,\&k) < 1$, contradicting the consequent of PIC*.

3. PROSPECTS FOR JÄGER'S ARGUMENT

The first flaw is a matter of putting forward a principle of informational closure, PIC, which is incompatible with Dretske's theory of

information. The second flaw arises because, having made that mistake, Jäger is led into trying to show Dretske committed to a substitution instance of PIC, namely, PIC*, which is a principle of the wrong form. As we have just seen, PIC* requires Dretske to be committed to the necessary truth of $P(\text{not-}h|k) < 1$. Even if Dretske would concede that he is so committed, we have seen that that won't help because under that assumption PIC* is contradictory.

Because of the two flaws, Jäger has not shown that 'at least for the kind of propositions here at issue, Dretske's information relation *is* closed under (known) entailment' (Jäger 2004:194). At this point, then, Jäger's problem for Dretske stands refuted (since it uses Dretske's commitment to PIC as a premiss).

Jäger's problem may yet be revived if there is a principle of informational closure to which Dretske is committed and which is sufficient for Jäger's argument. I shall now formulate such a principle, show Dretske to be committed to a substitution instance of it, and then consider how Jäger's problem for Dretske stands.

4. A GENERAL PRINCIPLE OF INFORMATIONAL CLOSURE

Where being informed of a proposition is a matter of receiving a signal that informs us, there are two conditions on an adequate characterisation of being so informed. First, that characterisation must respect the restriction on the propositions about which we *could* be informed by a signal. For example, a signal could not inform us of a logical truth, nor can we be informed by a signal of something we already know. Let's summarise this condition by saying that propositions of which we could be informed must be, in a certain sense, *available for signalling*. Second, both that and how the *signal* does the informing must be characterised, which we summarise by saying that it is the *signal that informs*. Putting these together we have an adequacy condition for a definition of signalled information:

Signalled Information: A signal gives you information that P iff that P is available for signalling and it is the signal that informs you that P.

A closure principle for information must respect *Signalled Information*. It is reasonably clear that this is achieved by the following formulation:

Principle of Informational Closure: If a signal, S, gives you information that E, you know that E entails G, and G is available for signalling, then S gives you information that G.

Prima facie, satisfying *Signalled Information* does not entail commitment to *Principle of Informational Closure*.

I shall now show that Dretske is committed to a closure principle of this general form. The detail will make it clear how deep the difficulty may lie for Dretske. Were his commitment to closure to depend solely on items that were in some sense purely internal to his theory he might avoid the difficulty by modifying those internal elements. But, as we shall see, his commitment arises from the way he satisfies *Signalled Information*, and since satisfying *Signalled Information* is a requirement on any theory of information, evading closure would require substantive change in his theory.

5. CLOSURE FOR DRETSKE'S INFORMATION

In Dretske's definition of a signal informing one of a proposition (see above), the two individually necessary and jointly sufficient conditions are probabilities conditional on one's background knowledge: the probability of the proposition absent the signal is less than one, and the probability given the signal is one. This satisfies the adequacy conditions of *Signalled Information*. First, it characterises availability for signalling in terms of a proposition having a probability absent the signal of less than one. Second, it characterises that and how it is the signal that does the informing: the signal makes the difference and the difference it makes is that its occurrence raises the probability of the proposition to one. As a consequence of satisfying *Signalled Information* in this way, it is fairly easy to show that Dretske is committed to the following substitution instance of the *Principle of Informational Closure*:

Closure for Dretske Information: If a signal, r, gives you Dretske information that p, you know that p entails q and q is available for signalling, then r gives you Dretske information that q.

Proof: Let k be your background knowledge. Given how Dretske's definition of information satisfies *Signalled Information*, *Closure for Dretske's Information* has the same meaning as the following conditional: If $P(p|r \wedge k) = 1$, $P(p|k) < 1$ and $P(q|k) < 1$, and you know that p entails q, then $P(q|r \wedge k) = 1$ and $P(q|k) < 1$. This conditional is true because: The first conjunct of the consequent follows from the antecedent by the lemma below and (obviously) the second conjunct follows because it is contained in the antecedent.

LEMMA. If $P(X|Y) = n$ and $X \models Z$ then $P(Z|Y) \geq n$. Proof $X \models Z$ iff $X \subseteq Z$.

Hence Dretske's theory of information commits him to *Closure for Dretske Information*,[2] and this commitment is in contradiction to his assertion that

> [the] kind of evidential relation ... required for knowledge [is] ...a "conclusive reason" or "information"... and this relation is itself not closed under known implication. We can have, in the relevant sense of "conclusive," conclusive reasons to believe *P* is true – we can, that is, get information that *P* is true – without having conclusive reasons to believe, without having information, that *Q* is true even if we know that *p* implies *Q*. (Dretske 2004:176–7)

At the very least, the evidential relation he says is required for knowledge is closed with respect to propositions available for signalling.

6. DRETSKE, CLOSURE OF INFORMATION AND CLOSURE OF KNOWLEDGE

What consequences does this have for Dretske's position with respect to closure of knowledge? Admittedly, *Closure for Dretske Information* does not give you *total* closure of knowledge, just because the requirement for propositions to be available for signalling will exclude some known entailments from being signalled when their entailing propositions are signalled.[3] Nevertheless, for any propositions which are available for signalling, Dretske's account of knowledge is closed under known implication, and this applies to some well known cases for which Dretske wants closure to be false. To take one of his most famous examples (Dretske 1970), since being a painted mule is available for signalling, if I know something to be a zebra by seeing it, I know it not to be a painted mule. Or take a recent example he uses in discussing contextualism:

> Clyde... can visually distinguish oranges from tangerines but he cannot distinguish them from wax imitations. (Dretske 2004:181)

Dretske says that this example generates unpalatable results for radical contextualists who accept closure, but not for himself because 'Once I give up closure....that I know they are oranges is consistent with not knowing they aren't wax' (Dretske 1983:182). But the oranges not being wax is available for signalling and consequently, since he knows they are oranges by sight, and he knows the implication that if they are oranges they are not wax, that they are not wax is information signalled to him (by *Closure for Dretske Information*) and hence known by him. Dretske may want to give up closure, but in these kinds of empirical cases he cannot.

7. DRETSKE, CLOSURE AND SCEPTICISM

What consequence does Dretske's commitment to *Closure for Dretske Information* have for his attitude to scepticism. Dretske says that the plausibility of his 'meaningful answer to skepticism' depends on the 'plausibility of giving up closure' (Dretske 1983:184–5 and see also Dretske 2005:23). In 'Skepticism, information, and closure: Dretske's theory of knowledge' (2004), Jäger is arguing that Dretske's theory of information is incompatible with Dretske's attitude towards scepticism. The flaws I have identified in Jäger's paper can be corrected by the fact of Dretske's commitment to *Closure for Dretske Information*. Jäger's arguments which make use of the premiss that Dretske is committed to closure of information will go through on the basis of *Closure for Dretske Information* provided the relevant propositions are available for signalling. For Jäger's discussion of Dretske's scepticism, we should take those remarks Jäger directs at PIC* as being concerned with the following substitution instance of *Closure for Dretske Information*:

$$\begin{aligned} CDI* \ & \text{If } P(e|r\&k) = 1,\ P(e|k) < 1,\ P(\text{not-}h|k) < 1 \\ & \text{and the subject knows } e \models \text{not-}h, \\ & \text{then } P(\text{not-}h|r\&k) = 1 \text{ and } P(\text{not-}h|k) < 1. \end{aligned}$$

The considerations which Jäger offers during his attempt to show PIC* true are (if correct) sufficient to show that Dretske is committed to the possibility of the satisfaction of the antecedent of *CDI**. For granted a case in which a signal *r* could give you Dretske information that *e* and in which you know that *e* entails *not-h*, Jäger's considerations are directed towards showing that in such a case *not-h* is available for signalling.[4] Since *Closure for Dretske Information* is true, so is *CDI**, and hence by modus ponens Dretske must allow the possibility that a signal *r* could give you information that scepticism is false.

For example, suppose that what you know contains some knowledge gained by information.[5] Having that information entails that a signal gave it to you. Moreover, you know that that knowledge entails not-*h*. Finally, suppose that not-*h* was at that time available for signalling. Perhaps your background knowledge contained only logical and mathematical truths, or perhaps it contained only knowledge of your experiences. Or if that does not suffice, then consider the import of Dretske's remark:

> The definition of a signal's informational content has been relativized to k [background knowledge]...This is a minor concession to the way we thing and talk about information. The k is dischargeable by recursive applications of the definition. (1983:108)

If background knowledge is dischargeable then we can be sure that the state from which all background knowledge has been discharged is one in which not-h is available for signalling. Then by *Closure for Dretske's Information*, the signal gave you information that not-h. Therefore if you know the entailment and have one piece of empirical knowledge, you know scepticism is false.

Hence, Dretske cannot hold onto both his theory of knowledge in terms of information and his denial that empirical knowledge settles the large question of scepticism. Furthermore, since *CDI** is weaker than PIC* (because its antecedent is stronger), basing Jäger's argument on *Closure for Dretske Information* rather than PIC requires a weaker commitment on Dretske's part. Consequently, not only does this proposed repair show that Jäger's larger point stands, it also gives Jäger a stronger result than he would have had, had PIC* been true.

ACKNOWLEDGEMENTS

I am grateful to Peter Baumann, Fred Dretske and Christoph Jäger for their helpful discussions and comments. Work on this paper was supported by the John Templeton Foundation.

NOTES

[1] Cf. Dretske 1981:65.

[2] We can now see the feature that underlies the falsity of *PIC Dretske*. A consequence of Dretske's definition of signal information is that no signal can ever inform one of propositions of which one is already informed, or already knows, or are entailed by whatever one is informed of or knows. Such propositions are *unavailable* for signalling, and any such unavailable proposition will furnish a counterexample to *PIC Dretske*.

[3] For a proposition to be signalled is for someone to receive an occurrent signal that informs them of the proposition.

[4] Because they are directed towards showing that in such a case Dretske cannot rule out that $P(\text{not-}h|k) < 1$.

[5] For brevity of exposition I am not spelling out the conditions concerned with being informationally caused or sustained.

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Manuscript submitted 3 October 2005
Final version received 16 February 2006