

## DEDUCTIVE CLOSURE AND EPISTEMIC CONTEXT

YVES BOUCHARD

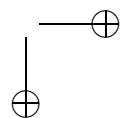
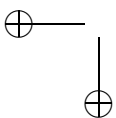
### *Abstract*

I argue in favor of the principle of deductive closure. I provide a characterization of the notion of epistemic context in terms of presuppositions in order to show how one can preserve deductive closure by limiting its applicability to a given epistemic context. This analysis provides also a redefinition of relevant alternatives from an epistemological point of view, that avoids any appeal to a counterfactual interpretation of relevance. In that perspective, relevance is conceived as a presuppositional quality. In regard to the debate with the skeptic, it is shown that her argument relies upon a context shift that compromises deductive closure because it alters the presuppositions at play. Finally, deductive closure is not only vindicated but is acknowledged as a contextual marker in the sense that a failure of deductive closure indicates a context shift.

### *Epistemic closure*

The general principle of epistemic closure stipulates that epistemic properties are transmissible through logical means. The principle of *deductive closure* (DC) or *epistemic closure under known entailment*, a particular instance of epistemic closure, has received a good deal of attention since the last thirty years or so. DC states that: if one *knows that p*, and she *knows that p entails q*, then she *knows that q*. It is generally accepted that DC constitutes an important piece of the skeptical argument, but the acceptance of an unqualified version of DC is still a matter of debate. For the defenders of the DC principle the challenge consists in defining the conditions under which it applies. In this paper, I shall try to specify these conditions.

Since Dretske's (1970) seminal paper on epistemic operators, several strategies have been explored to evaluate the DC principle, most notably the strategy based upon the analysis of the necessary conditions of knowledge (Nozick, 1981; Warfield, 2004; Brueckner, 2004; Murphy, 2006), and the strategy based upon the relevant alternatives (RA) view (Dretske, 1970; Stine,



1976; Cohen, 1988; Heller, 1999). Several solutions provided by RA theorists have been spelled out in externalist terms, essentially by means of a counterfactual analysis. Dretske (1970; 2006) and Nozick (1981, p. 204 ff.) have notoriously argued against DC from two different perspectives, but they nonetheless share a counterfactual interpretation of relevant alternatives. As for me, I will rather follow Williams (1996) regarding what he takes to be a *non sequitur* between the Dretske-Nozick strategy and non-closure. I want to preserve both DC and the notion of relevant alternatives, which is, as Goldman underlines it, a major issue:

The qualifier 'relevant' plays an important role in my view. If knowledge required the elimination of all logically possible alternatives, there would be no knowledge (at least of contingent truths). If only *relevant* alternatives need to be precluded, however, the scope of knowledge could be substantial. This depends, of course, on which alternatives are relevant. (1976, p. 775)

Dretske defines a relevant alternative in the following way: "A relevant alternative is an alternative that might have been realized in the existing circumstances if the actual state of affairs had not materialized." (1970, p. 1021) Dretske's definition demands that a knowledge claim be evaluated in function of counterfactual situations. But the possible worlds semantics needed for an interpretation of counterfactual situations is not without difficulties. For instance, selecting an epistemic criterion for ordering the set of possible worlds in order to measure proximity and to fix the boundaries of relevance is not an uncontroversial task. Ontological relevance is an obscure notion and world proximity alone does not seem to help much here. What I would like to submit is a definition of RA that is strictly epistemological (and logical) rather than ontological, and that will enable me to preserve DC. It is worth noting at this point that the gist of my suggestion lies in moving the starting point from an externalist perspective to a more internalist one.

In a paper that presents the several epistemological motivations behind the RA strategy, P. Rysiew concludes that "dressing disagreements about closure or contextualism up in the language of disputes about the RA approach itself is, and has been, counter-productive." (2006, p. 276) I endorse Rysiew's claim that the RA view is neutral towards a justificational analysis of knowledge. But, on the other hand, I will defend the idea that the answer to the question 'What exactly makes any alternative a relevant one?' gives us important clues regarding the debate over DC (and contextualism). The notion that I will use as a middle term between RA and DC is the one of *epistemic context*. So, what I want to do is to link tightly RA to the notion of context in order to restrict the domain of application of DC (following in part Dretske).

Therefore, in the end, what I am promoting is a qualified version of the DC principle. This should not appear to the reader more awkward than defending the idea that the principle of elimination of double negation is restricted to classical logic (and stronger systems).

### *Epistemic context*

From a conversational point of view, a context is what is *taken for granted*. From an epistemological point of view, I will define an epistemic context as a set of basic (or contextual) beliefs.<sup>1</sup> That set includes beliefs about our environment but also beliefs about our own epistemic attitudes, epistemic standards, and so on. For instance, I may entertain beliefs like: my sensory experience is generally reliable, or, in normal conditions, if I see an object *o* with property *P* then I know that  $P(o)$ . These beliefs are nothing but *pragmatic presuppositions*, as Stalnaker has correctly pointed out:

The distinction between presupposition and assertion should be drawn, not in terms of the content of the propositions expressed, but in terms of the situations in which the statement is made — the attitudes and intentions of the speaker and his audience. Presuppositions, on this account [pragmatic account], are something like the background beliefs of the speaker — propositions whose truth he takes for granted, or seems to take for granted, in making his statement. (1999, p. 48)<sup>2</sup>

The set of contextual beliefs exhibits two noticeable features: (1) the contextual beliefs are simply taken as true (and, of course, they *may* be true); (2) the contextual beliefs lie outside the *justification space*, which is occupied by the different knowledge items. In order to convert a contextual belief *p* into knowledge, *p* has to meet the epistemic standards in use. The first consequence of this analysis is that an epistemic agent *cannot know a presupposition*. Dretske has already underlined that point: "These presuppositions, although their truth is entailed by the truth of the statement, are not part of what is *operated on* when we operate on the statement with one of our epistemic operators." (1970, p. 1014) Wittgenstein (1969) also insisted

<sup>1</sup> These beliefs are not basic *per se*. Their basicity is due to the epistemic function they realize.

<sup>2</sup> See also Lewis (1979).

particularly on that aspect by means of his analysis of the difference between certainty and knowledge (*contra* Moore).

Now, in virtue of this characterization of an epistemic context, I can define a relevant alternative as *an alternative that does not affect the epistemic context in use*. An alternative may affect an epistemic context in many ways. For instance, it may require an additional presupposition, or several presuppositions, which can be compatible or not with the other presuppositions, or it may require that a particular presupposition becomes justified. But as soon as such a change has taken place, a new epistemic context has been set. Context shifts resulting from the addition of presuppositions to the context may generate deductive closure failures,<sup>3</sup> since the total amount of presuppositional information has increased. So, in order to ensure the validity of the DC principle, a constraint must be imposed on the epistemic context. The following condition will do the work: *if the presuppositions of the alternative at stake do not affect the epistemic context, then DC holds.*<sup>4</sup> Contrastively, a failure of DC indicates a context shift. And given by definition that relevant alternatives do not alter the epistemic context, then DC holds for relevant alternatives. That shows clearly the strong relation between DC and presuppositions. What is determinative is what one does take for granted in the *actual* epistemic context, not what would happen in a *counterfactual* situation (a possible world close or not to the one she is in).

This definition of an epistemic context will prove useful in defining conditions under which operations on epistemic contexts may be performed. Such considerations go beyond the scope of this paper, but, as an example, a *permissible contextual expansion* can be defined this way:

A permissible contextual expansion with respect to an epistemic context  $c$  is the addition of a *compatible* presupposition  $r$  to  $c$ , such that if  $c = \{p, q\}$  then  $c \cup r \not\models \neg p \vee \neg q$  and the agent must satisfy  $\text{Believe}(p \wedge q \wedge r)$ .<sup>5</sup>

<sup>3</sup> Cohen has already noticed that point: "The apparent closure failures are illusions that result from inattention to contextual shifts." (1988, p. 111)

<sup>4</sup> For a similar view, see Williams (1996).

<sup>5</sup> The agents actually do not need to have an explicit belief towards this conjunction, but they must be disposed to give their assent to such a conjunction. The definition of permissible contextual expansion prevents inconsistency within the set of presuppositions only, not within the justification space. Also, some parts of the belief revision theory of Gärdenfors (1988) might be used to define operations on contexts as long as they are so modified as to apply to presuppositions and not simple beliefs.

This is very close to Lewis' rule of accommodation for presupposition, except that what is left undefined by Lewis' rule (its limits of application) is here at least logically defined.<sup>6</sup> Furthermore, the notion of epistemic context allows for different characterizations of contexts. For instance, in the case where a tacit epistemic standard (a qualification method) is at issue, the context can be envisaged as an *epistemological context*, otherwise it is simply a *normal epistemic context*, i.e. a context in which knowledge simply operates.

*Context shift*

Before continuing to consider the DC principle in the light of my proposal, there is an aspect of the principle that is in need of clarification because there is a threat of equivocation that lurks in the debate. An important obstacle to a proper evaluation of the problem is the *apparent homogeneity* of the K-operator. In the general formulation of the DC principle, one has to pay close attention to the characterization of the three K-operators involved:  $K_1\phi, K_2(\phi \supset \psi), K_3\psi$ . The reasons why an agent  $s$  knows that  $\phi$  and knows that  $\phi \supset \psi$  might be empirical and different from each other, but the reason why  $s$  knows that  $\psi$  has to be logical;  $s$  has to believe in the validity of the modus ponens to get  $K_3\psi$ . Consequently,  $s$  knows that  $\phi$  and  $s$  knows that  $\psi$  do not convey exactly the same meaning. There is a significant difference for  $s$  with regard to her epistemic commitment to  $\phi$  (or  $\phi \supset \psi$ ) and to  $\psi$ .<sup>7</sup> That means if  $s$  is challenged about her knowledge of  $\psi$ ,  $s$  would rely upon logical reasons (classical logic, for instance) and if in some circumstances modus ponens cannot be applied, then neutralizing the logical reasons would have no effect on the non-logical reasons for the knowledge of  $\phi$  and the knowledge of  $\phi \supset \psi$  — as far as the logical and non-logical reasons are independent. Despite this shift in the epistemic standards used to qualify the knowledge of  $\phi$  (or  $\phi \supset \psi$ ) and the knowledge of  $\psi$ , it is not

<sup>6</sup>Lewis' rule of accommodation for presupposition stipulates that: "If at time  $t$  something is said that requires presupposition P to be acceptable, and if P is not presupposed just before  $t$ , then — *ceteris paribus* and within certain limits — presupposition P comes into existence at  $t$ ." (1979, p. 340) As regards Lewis' *sotto voce* proviso (1996, p. 554), which seems to show also some similitudes, it remains quite different since it is encapsulated into a definition of knowledge instead of being considered from a strictly logical point of view.

<sup>7</sup>This is more obvious in the case of Gettier's type II problems, where the principle at stake is epistemic closure for disjunction :  $K\phi \supset K(\phi \vee \psi)$ . This shift in justification is generally not allowed in non-strictly logical contexts.

necessary to get into a detailed investigation on the kind of theory of justification that is preferable.<sup>8</sup> In normal epistemic contexts, the truth of all the epistemic standards at play is presupposed. Hence, a solution to the DC problem should be generally valid for any epistemic standard.

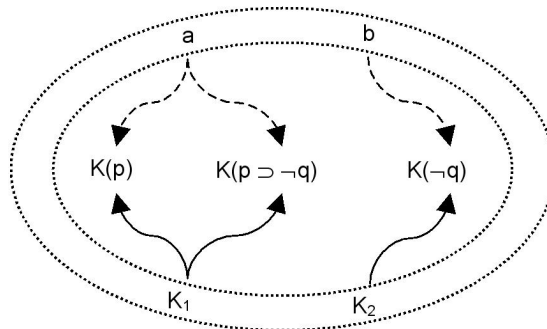
Now, let's consider Dretske's (1970, p. 1015 ff.) paradigmatic case of a visit at the zoo:

$K(p)$ : I know that this animal is a zebra.

$K(p \supset \neg q)$ : I know that if this animal is a zebra, then this animal is not a cleverly disguised mule.

$K(\neg q)$ : I know that this animal is not a cleverly disguised mule.

Let's represent the situation this way:



$\{a, b, K_1, K_2\}$  is the set of contextual beliefs, call it the *presuppositional belt*, in which  $\{K_1, K_2\}$  are epistemic standards, the solid arrows give the meaning (the indexical content) of the K-operator, and the dotted arrows mean 'is presupposed by'. A direct corollary that follows from accepting the inclusion of the epistemic standards into the presuppositional belt, is the indexicality of the knowledge predicate. While the *character* (the invariant part) of the predicate might be understood as a success term (i.e., following Williams (2001)), if one knows something, it's because one has satisfied some epistemic standards, its *content* (the variable part) is specified by the epistemic standards at play in the current epistemic context.<sup>9</sup>  $\{K_1p, K_1(p \supset \neg q), K_2\neg q\}$  are the knowledge items in the justificational space. Note that the difference in the epistemic standards used to qualify

<sup>8</sup> For such an investigation in terms of a theory of justification, see among others Audi (1991), Feldman (1995) and Hales (1995).

<sup>9</sup> DeRose (1992) offers a slightly different analysis.

$p$  and  $\neg q$  is made explicit. Knowledge of  $p$  satisfies the epistemic standard  $K_1$ , whereas knowledge of  $\neg q$  satisfies the epistemic standard  $K_2$  (in this case, classical logic). Taking advantage of my previous definitions, I can say that if  $q$  (being a cleverly disguised mule) is a relevant alternative, then the presuppositional belt remains unaffected. On the other hand, if  $q$  is not a relevant alternative, then to make it relevant would require to alter the epistemic context by expanding the presuppositional belt with the required and compatible presuppositions, and these contextual alterations, more or less pervasive, would be echoed in the entire belief network. In Dretske's example,  $q$  presupposes a number of things that are not part of the given context, and some of the required presuppositions by  $q$  are clearly incompatible with the actual context. For instance,  $q$  presupposes that someone has cleverly disguised the mules and that someone had the intention to deceive the zoo visitors for some reason, call this presupposition  $b$ . This presupposition is incompatible with the one, call it  $a$ , according to which the visitor believes she is visiting the zoo 'under normal circumstances', viz. if the zoo authorities have marked the pen with 'zebras' then the animals in the pen *are* zebras. So, in order to accommodate the context for  $q$ , presupposition  $a$  has to be denied (or simply rejected). If the agents agree to do so (tacitly or explicitly), and by the same token agree to raise the epistemic standards, then  $K_1$  becomes inappropriate as an epistemic standard, a stronger one is needed, one that will permit the discrimination between  $p$  (being a zebra) and  $q$  (being a cleverly disguised mule).<sup>10</sup> As a result,  $K_1(p)$  would be henceforth false (it is false that the visitor knows it is a zebra),  $K_2(\neg q)$  could not be justified logically, and the whole case would not be a case for epistemic closure anymore.<sup>11</sup>

This is not only a matter of accent on the role of presuppositions, but most importantly a matter of what comes first. For instance, Stine, who wants to preserve deductive closure while accepting the RA view, suggests the following analysis:

To say that John knows that  $p$  does normally presuppose that not- $p$  is a relevant alternative. This is, however, a pragmatic, not a semantic presupposition. That is, it is the speaker, not the sentence (or proposition) itself, who does the presupposing. Thus, the presupposition falls in the category of those which Grice labels 'cancellable'. (1976, p. 255)

<sup>10</sup> See Goldman's (1976), minus the counterfactual analysis, and Lewis' (1979), minus the automatic character of the raise of standards.

<sup>11</sup> Williams (1996) has brought this last point into clear focus.

The problem with such an account is that *relevance itself* is presupposed and therefore taken as a kind of primitive notion. On my view, the notion of presupposition comes first and can serve as a *definiens* for the notion of relevant alternative. From that perspective, relevance is a property of a relation between an alternative and an epistemic context (not an absolute property), and the principle of deductive closure is valid insofar the pragmatic context remains the same, in other words, insofar the presuppositions remain compatible. For Stine, it is rather the set of relevant alternatives itself that has to remain fixed: "my account holds the set of relevant alternatives constant from beginning to end of the deductive closure argument. This is as it should be; to do otherwise would be to commit some logical sin akin to equivocation." (1976, p. 256) Moreover, Stine's view may allow an agent to refuse explicitly to presuppose an alternative (imagine a crucial one, for example), since relevant alternatives are alternatives taken for granted. But, in order for an agent to refuse a relevant alternative in my sense, it would not suffice to simply rule out one particular alternative by *fiat* or collective agreement.<sup>12</sup> The agent would have to refuse the whole logic that justifies it, as well as what it presupposes. This is one reason why deductive closure is so important as an instrument in our scientific endeavors: it can force us, as long as we agree on one logic, to explore hidden possibilities within the limits of a given and consistent epistemic context.

Despite its internalist commitment, my proposal remains in line with some contentions of Goldman and Heller, who both defend a counterfactual interpretation of the RA view. My account only makes explicit something that is kept more or less implicit in their views. For instance, Goldman acknowledges the role of the context in the determination of some alternatives:

It is not only the circumstances of the putative knower's situation, however, that influence the choice of alternatives. The speaker's own linguistic and psychological contexts are also important. If the speaker is in a class where Descartes' evil demon has just been discussed, or Russell's five-minute-old-world hypothesis, he may think of an alternative he would not otherwise think of and will perhaps treat them seriously. (1976, p. 776)

Heller is more explicit regarding the relation between the context and the set of possible worlds. According to him, the pragmatic context plays two roles: (1) "the context in which the utterance is made determines which respects

<sup>12</sup>The mere mentioning of alternatives is also insufficient for raising the standards, and thus altering the context, as Lewis defends. The context must allow for the presuppositions required by the alternatives.



of similarity are to be assigned the most weight when ordering worlds", and (2) it determines "how similar enough a world has to be to the actual world to be similar enough to be relevant." (1999, p. 203)

I believe this shows, in last analysis, that what is primarily determinative in the selection of relevant alternatives is not the counterfactual situations at stake, but rather structural elements of the epistemic context at play. In qualifying alternatives, one does not need a semantic theory that will account for a difference between 'normal' and 'bizarre' worlds in terms of a proximity relation for a set of possible worlds, one only needs to track *context shifts*.<sup>13</sup> In the suggested perspective, a relevant alternative is context preserving, and that means it is a function of epistemic presuppositions.

### *Relevance as a presuppositional quality*

One can capture several proposals of definition of RA in terms of three conceptual groups centered on possible world proximity, discriminability, and sensitivity. According to this classification, an alternative  $\alpha$  is relevant if:

1.  $\alpha$  as a possible world is close the actual world (Dretske, 1970; Cohen, 1987; DeRose, 1995; Heller, 1999);
2.  $\alpha$  is discriminable (Goldman, 1976; McGinn, 1984);
3. Belief( $\alpha$ ) is truth-tracking (Nozick, 1981; DeRose, 1995; Sosa, 2000).

Of course, these groups can intersect partially, as in the case of DeRose, and they can involve common notions such as counterfactuality. Groups 1 and 3 require some ontology, a commitment I avoided, and group 2 requires a theory about perceptual experience. *Prima facie* the above analysis escapes all of these groups since relevance is characterized only in virtue of its relation to an epistemic context. But, within these groups, some more or less explicit links with the notion of presupposition have been made. The one I will focus on comes from McGinn, who defends a discrimination account of knowledge and argues against deductive closure. McGinn writes:

Now it seems to me that this point about relevance is a virtual datum about discrimination and knowledge: it is simply what the concept intuitively involves, and I cannot see how one could hope to

<sup>13</sup> While discussing contextualist positions, Hendricks writes: "There is not any obvious way to ensure that such a contextual change is not taking place." (2006, p. 72) Even though my proposal is not an 'obvious way' to track context changes, it remains nonetheless a reliable indicator.

prove it from independent epistemological principles. When we ask whether someone knows a particular proposition  $p$ , we just do tacitly presuppose a range of propositions  $R$  somehow determined by  $p$  whose truth values must be discriminable by the would-be knower. [...] I have no precise criterion for this kind of relevance, but I think we do have an intuitive grasp upon how the requirement operates. (1984, p. 544)

The two aspects that I want to underline are: the presupposed range  $R$  of propositions is (1) *somehow* determined by a given proposition and (2) the truth-values of the propositions in  $R$  are *discriminable* by the agent. The main difficulty with such a characterization is that the notion of presupposition is tainted by psychological considerations, for cognitive capacities of discrimination with respect to a subject matter draw the line between relevance and irrelevance. In McGinn's view, what makes a proposition relevant has nothing to do with its presuppositional status *stricto sensu*. Relevance implies discriminability. This notion of discriminability is strongly perception-oriented. It seems to deliver the right conclusion with a brain-in-a-vat argument, where the two perceptual experiences at play exhibit no difference at all. But what about some argument of a lesser perceptual flavour? At the present time, nobody can discriminate between the truth-values (assuming respectfully that the reader is not an intuitionist!) of Goldbach's conjecture. Does that imply that it cannot be used as a relevant presupposition in some particular mathematical context? I do not think so. Besides, McGinn still has to explain how — otherwise than by just saying 'somehow' — a given proposition determine the range of presuppositions. McGinn's own lack of a 'precise criterion' responsible for the sort of relevance he has in mind is just a consequence of his discrimination account. Since discriminability is not an interpropositional property, but a property of a relation between a proposition and an agent's cognitive capabilities, it is no surprise that such a notion cannot shed any light on the notion of relevance, which is rather an epistemic property pertaining to a proposition conceived in relation to a propositional system.

On my view, the propositions in  $R$  are nothing else than sheer presuppositions, i.e. propositions whose truth-values are logically presupposed by the propositions at stake. It appears then that McGinn's discriminability requirement is plainly too strong because the truth of a presupposition need not be discriminable but simply taken for granted. A presupposed proposition might be actually truth-discriminable, but it is not this property that makes it relevant. This objection against a discrimination account can also be raised against a counterfactual account, according to which relevance is characterised in terms of counterfactual situations in possible worlds. Many views

oscillate between an unqualified counterfactual situation analysis (Dretske, 1970) and a qualified counterfactual situation analysis (DeRose, 1992; Sosa, 2000). In all these views, the counterfactuality needs to be assessed ontologically. For instance, in the qualified view, one usually requires a proximity parameter to identify relevant situations among all counterfactual situations. Possible worlds are compared in terms of factual similarity with the actual world. But this comparison is all based on actual/possible states of affairs and relevance in that view boils down to ontological relevance. It does not take into consideration the *logical relation* between the presuppositions at play in a given epistemic context and the presuppositions required by a skeptical situation in that context. As one can see, both the discrimination account and the counterfactual account of RA show the same defect: they rely upon a defining property of relevance that is not an interpropositional property. Either psychology or ontology plays a major role in these accounts, but none of them can really salvage the DC principle once it is exposed to the skeptical argument.

### *Conceptual gains*

In conclusion, if the above analysis is correct, then one gets three conceptual gains out of it. (1) DC is vindicated within the limits of relevant alternatives, which are understood in terms of epistemic presuppositions rather than in terms of counterfactual situations or discriminability. (2) DC can be used as an epistemic contextual marker. A failure of DC clearly indicates a context shift, i.e. an alteration of the presuppositional belt. (3) This general framework provides interesting clues on the kinematics of epistemic normativity. As it turns out, epistemic normativity normally operates in the background (i.e. an epistemic context), as the epistemic standards are presupposed by the agents and provides the agents with a justification space where all the epistemic practices are well regimented by specific epistemic standards — this is the place where epistemological contextualism receives additional support.

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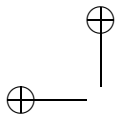
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E-mail: yves.bouchard@usherbrooke.ca

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