# In Search of an Integrated Logic of Conviction and Intention

by Hans-Ulrich Hoche,
University of Bochum, Germany

**Abstract**

According to a two-level criterion for combination tests in the field of ordinary language (C-CT), moral ‚ought'-sentences may be taken to imply 'I intend'-sentences partly semantically and partly pragmatically. If so, a trenchant linguistic analysis of the concept of moral obligation cannot do without a non-classical logic which allows to model these important kinds of ordinary-language implications by means of purely syntactical derivations. For this purpose, an integrated logic of conviction and intention has been tentatively devised by way of a doxastically, buletically and pragmatically extended calculus of natural deduction. This system of buletic logic cannot even be launched without one or two derivation rules of deductive closedness. However, these very closedness rules appear to be responsible for buletic paradoxes which are analogous to paradoxes long since known from other, less exotic branches of logic but at first sight look much more virulent. After having scrutinized two potential strategies for coping with the paradoxes of buletic logic, finally we can convince ourselves that these paradoxes, as well as their familiar non-buletic counterparts, are but *apparent* paradoxes, provided we consistently lean on C-CT and do not let *pragmatical* considerations intrude into *purely logical* ones.

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## 1. Introduction:
### Metaethics and the need of an integrated logic of conviction and intention

**1.1.** In order to strengthen and further develop the metaethical approach of 'Universal Prescriptivism' suggested by Richard M. Hare,[1] in some former writings I tried (a) to get rid of the shortcomings of his definition of informal entailment (i.e., entailment as a relation between non-formalized or ordinary-language sentences);[2] (b) to replace his purely informal imperative-logical basis with a semi-formalized system which, though perhaps with a grain of salt, may be characterized as the groundwork

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[1] See esp. Hare 1952; 1963; 1981.
[2] See esp. Hoche 2003.

of a 'buletic logic' (i.e., a logic of intending, or rather an integrated logic of conviction and intention); (c) to expose, by means of the instruments thus obtained, the inner logical structure of moral 'ought'-sentences; and (d) to prove, on the basis of the latter analysis, that a universalized version of the well-known moral principle of the Golden Rule – a version which was in use at least in ancient Greece – is an analytical truth.[3]

**1.2.** In the present paper, I shall confine myself to reviewing a number of difficulties pertaining to (b). But since I cannot expect the reader to be sufficiently acquainted with my position concerning (a), I shall have to begin by restating, as briefly as possible, my reasons for being discontented with Hare's definition of entailment within the field of ordinary, or natural, language, and by restating the criterion which I propose to substitute for Hare's definition.

### 2. An improvement on Hare's definition of informal entailment by means of introducing a more detailed criterion for combination tests (C-CT)

**2.1.** Hare believes that, for the purposes of metaethics (and, I take it, for all other purposes of ordinary language philosophy), the concept of entailment 'may be defined accurately enough' as follows: 'A sentence P entails a sentence Q if and only if the fact that a person assents to P but dissents from Q is a sufficient criterion for saying that he has misunderstood one or other of the sentences'.[4]

**2.2.** But this will hardly do. For suppose I assent (say, in answering questions by making my choices in a psycho-therapeutical questionnaire) to the statement

> (1)     My wife deceives me.

but dissent from the statement

> (2)     I (strongly) believe [am convinced] that my wife deceives me.[5]

In a situation in which I do so I may justly be thought to have misunderstood at least one of these statements. So, according to Hare's definition, statement (2) ought to be *entailed* by statement (1). However, if this were the case, the combination of (1) with the negation of (2), scil., the statement

> (3)     My wife deceives me, and [but] I don't believe that my wife deceives me.,

would have to be self-contradictory, which it is clearly not; for 'it may quite well be true',[6] as may be gathered from the fact that the modalized statement

> (4)     It is possible that my wife deceives me but that I don't believe so
>          [that I don't believe that my wife deceives me].

obviously *is* true. Besides, (3) is a clear-cut case of 'Moore's paradox', which by no means ought to be mistaken for a self-contradiction. So Hare's definition seems to capture, not just logical implication or entailment, but other implications besides.

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[3] See esp. Hoche 1992a; 1992b; 1995a; 1995b; 2001.

[4] Hare 1952: 2.4, p. 25. Cf. ibid., 11.3, p. 172: 'to say that one judgement entails another is simply to say that you cannot assent to the first and dissent from the second unless you have misunderstood one or the other'. – I take it that the refinements Hare discusses in the context of the first passage just referred to are not relevant to our present purposes.

[5] In my exemplary sentences, and likewise in my formulation of C-CT in sect. 2.3, I shall strictly distinguish between the uses of round and square brackets: What is put in *round brackets* could as well be omitted but may be useful in that it hints to nuances of meaning or renders a reading unambiguous; what is put in *square brackets*, however, is to be understood as an *alternative* to the preceding expression(s).

[6] Moore 1944: p. 175.

**2.3.** On the basis of such considerations, a more detailed criterion for distinguishing between no less than four specific kinds of linguistic implication may be proposed.[7] Because of the typical form of the linguistic tests to be used in making these distinctions, let me call it the 'criterion for combination tests' ('C-CT'):

C-CT: Given two interpreted sentences[8] of a natural language, 'φ' and 'χ',[9] let us say that '*φ*' *implies* '*χ*' *linguistically* if and only if it would be linguistically absurd, or a sufficient reason for being suspected to have grossly misunderstood one or other of these sentences, to assent to 'φ' but in the same breath to refuse to assent to 'χ'.

If we spot a linguistic absurdity of this generic type, let us take a second step and test the modalized combination 'It is (counterfactually or objectively) possible that φ and [but] that not χ.', which is to be operationalized in the sense of 'I can conceive, in the mode of counterfactual imagination,[10] a situation [a counterfactually possible world] with respect to which I am prepared to say here and now that φ and [but] (that) not χ.'. As far as this modalization or 'possibilization' is concerned, there are exactly three possibilities: it can be *false*, *true*, or *nonsensical* (in the way of being *ungrammatical,* i.e., violating at least one rule of the 'surface grammar' or the 'depth grammar'[11] of the natural language in question).

[1] If this possibilization is *false* let us say that the unmodalized combination 'φ and [but] not χ.' is semantically or logically inconsistent, and that '*φ*' *implies* '*χ*' *semantically (logically)*, or *entails* it.

[2] If the possibilization is *true* let us say that the unmodalized combination 'φ and [but] not χ.' is pragmatically inconsistent, or a case of 'Moore's paradox', and that '*φ*' *implies* '*χ*' *pragmatically*, or in a 'Moorean' way.

[3] If the possibilization is neither true nor false but *ungrammatical* let us say, in default of a more suitable technical term, that the unmodalized combination 'φ and [but] not χ.' is catapragmatically inconsistent and that '*φ*' *implies* '*χ*' *catapragmatically*.

Finally, if [a] both 'φ' and 'non-φ' imply 'χ' *semantically* according to [1], and if [b] 'χ' is *'purely contingent'* in the sense of being either a contingent (i.e., neither logically true nor logically false) atomic sentence or else a molecular sentence having only contingent constituents,[12] then let us say that the two related unmodalized combinations 'φ and [but] not

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[7] Hoche 2003: 2.2. For slightly deviating predecessors see Hoche 2001: II.1 and 1995a: 1.3. Similar criteria, in which, however, the case of presupposition was still omitted, have been proposed in Hoche 1981; 1990: 8.2–8.5; 1992a: 1.5–1.12; 1995b: sect. II; Hoche & Strube 1985: A.IV.3–4; Dudda 1999: 2.3.

[8] If the sentences are of indicative form, instead of speaking of an 'interpreted sentence' we may simply speak of a 'proposition' as long as by this extraordinarily ambiguous technical term we understand a 'sentence as used [not: uttered] by a particular speaker on a particular occasion' (Hare 1952: 2.4, p. 25; cf. Strawson 1950: sect. II). In what follows, I shall frequently also omit the attribute 'interpreted' and simply speak of 'sentences'.

[9] It is to be understood, first, that both of these sentences are interpreted *in accordance with each other*, or used on *one and the same* occasion; second, that each of them, taken by itself, is perfectly all right, i.e., neither nonsensical (meaningless) nor self-contradictory (inconsistent); third, that we are thoroughly familiar with these sentences, which is to say, among other things, that we completely master the general terms, and precisely know the references of the individual expressions, they contain. Moreover, at least in doubtful cases it seems to me to be advisable that each of us confine himself to scrutinizing sentences of his respective 'idiolect' (cf. Hoche & Strube 1985: A. IV.1.f). Of course, such a 'personal language' must not be mistaken for a 'private language', for the impossibility of which Wittgenstein 1953, to my mind, has indicated good reasons.

[10] Cf. Hoche 1990: ch. 9 ('Moeglichkeit und Vorstellbarkeit' ['Possibility and conceivability']), esp. 9.3, 9.5.

[11] Cf. Wittgenstein 1953: § 664.

[12] The details of condition [b] I owe to Knoop 2001.

χ.' and 'non-φ and [but] not χ.' are *void of reference*, or *mere pseudo-propositions or would-be propositions*, and that both '*φ*' *and* '*non-φ*' imply '*χ*' *presuppositively*, or *presuppose it.*[13]

**2.4.** The opening paragraph of C-CT differs only slightly from Hare's definition of entailment. As a matter of fact, I think that virtually both coincide with each other. It is true, of course, that it is not the same thing whether we *dissent* from a given indicative sentence (because we believe that the opposite is true) or simply *refuse to assent* to it (because we have no idea whether it is true or false); and it is also true that we have to distinguish between *dissenting* from an imperative sentence (because we intend not to do what we have been told) and simply *not being prepared to assent* to it (because we want to leave it open what we shall do, or think it inappropriate that we have been asked to do such and such a thing).[14] However, Hare's wording seems to me to be stronger than it ought to be, and probably also stronger than he himself intends it to be. For suppose, for instance, that someone assents to the statement that Tim is a bachelor (in the non-academic and non-zoological sense of the word). Then a partial lack of linguistic competence on his side can be seen from the fact alone that at the same time he *refuses to assent* to the statement that Tim is unmarried; i.e., in this case we need not postpone our passing judgement on his linguistic faculties until he goes farther and positively *dissents* from the latter statement.

**2.5.** As far as the sub-criteria [1] and [2] are concerned, the reader can easily see, first, that the sub-criterion [1] for *semantic implication*, or 'entailment' as a relation between interpreted sentences of a natural language, virtually coincides with the definition usually given in modal logics for the concept of entailment, or logical implication, in the field of formalized language: '$\varphi \models \chi =: \neg \Diamond (\varphi \,\&\, \neg \chi)$'; and second, that the sub-criterion [2] for *pragmatic implication* has been tailored in accordance with Moore's remark, quoted in section 2.2, above, that the paradoxes called after him 'may quite well be true'.

### 3. Semantic and pragmatic implications of 'I intend'-sentences according to C-CT

**3.1.** What is less easily seen is how the concepts of catapragmatic implication and of presupposition fit in. This, however, is quite irrelevant for the purposes of the present paper: Obviously, the problem of presupposition has little or nothing to do with metaethical or related logical considerations; and as far as the concept of catapragmatic implication is concerned, it is highly relevant to Hare's imperative-logical approach but not at all relevant to my divergent version of universal prescriptivism, in which 'I intend'-sentences are supposed to play the part that imperatives play in Hare' version. For according to C-CT, moral 'ought'-sentences imply *imperatives catapragmatically*[15] but *'I intend'-sentences* either *semantically* or *pragmatically*, as the case may be. In the present paper, I shall completely abstain from trying to give any reasons for this claim;[16] for in what follows, I shall focus my attention as strictly as possible on 'I intend'-sentences.

**3.2.** That 'I intend'-sentences are semantically or pragmatically implied in many other sentences besides 'ought'-sentences can be easily seen by inspecting a couple of simple examples, such as the following pair of sentences, interpreted in accordance with each other,

> (5)     I intend [want] to arrest all the suspects,
>         and I strongly believe [am convinced] that Mr. Baker is one of the suspects.

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[13] From this definition it becomes obvious that I take presupposition to be a sub-case of semantical implication or 'entailment'. Although this position seems to have been refuted long since (see, e.g., Gazdar 1979: p. 90 f.), I endeavoured to show that it is none the less tenable, and that an impression to the contrary is likely to be due to the strong tendency of many logicians to make light of the difference between propositions and mere pseudo-propositions. See also Knoop 2003a.

[14] In other words: I take it that *dissenting* from 'φ' amounts to assenting to 'non-φ' whereas *not assenting* to 'φ' need not include assenting to 'non-φ'; for it is always possible that, because of lack of evidence or lack of determination, we can neither assent to 'φ' nor assent to 'non-φ'.

[15] See Hoche 2003: 6.3.

[16] Of course I have done so elsewhere; see esp. Hoche 2001: V.2, IX.2.

(6)     I intend [want] to arrest Mr. Baker.

If I assent to (5) but at the same time refuse to assent to (6), I may be justly taken to have profoundly misunderstood one or other of these sentences. In point of fact, if you can make sure by whatever related linguistic tests that I sufficiently master the use of all the non-buletic and non-doxastic linguistic parts of the sentences in question, you would be perfectly justified to say that I simply do not understand the verb 'to intend' and/or the verb 'to believe'. So, according to criterion C-CT, (5) implies (6) linguistically. To determine the specific sort of linguistic implication, in the next step we have to answer the question of whether the possibilization

(7)     It is possible that I intend to arrest all the suspects
        and that I strongly believe that Mr. Baker is one of the suspects,
        but that (none the less) I don't intend to arrest Mr. Baker.

is false, true, or ungrammatical. Relying on my personal imaginative and idiolectic competence,[17] I cannot help saying that (7) is *false*; for it is not the case that I can conceive, in the mode of counterfactual imagination, a situation with respect to which I am prepared to say here and now that I intend to arrest all the suspects and that I strongly believe that Mr. Baker is one of the suspects, but that none the less I don't intend to arrest Mr. Baker. So, according to C-CT, (5) implies (6) *semantically*.

**3.3.** Let us now replace sentence (5) with the slightly changed sentence

(8)     I intend to arrest all the suspects, and Mr. Baker is one of the suspects.

Obviously, if I assent to (8) but refuse to assent to, or even dissent from, (6) – for instance, by asserting both (8) and the negation of (6) in the same breath –, my piece of linguistic behaviour will be taken to be no less absurd than in the case of (5) and (6). So, according to C-CT, not only (5) but also (8) implies (6) linguistically. But in this case, the modalized sentence

(9)     I can conceive, in the mode of counterfactual imagination, a situation with
        respect to which I am prepared to say here and now that I intend to
        arrest all the suspects and that Mr. Baker is one of the suspects,
        but that (none the less) I do not intend to arrest Mr. Baker.

is obviously *true*; for in the counterfactual situation thus imagined I need not believe that Mr. Baker is one of the suspects. So (8) implies (6) only *pragmatically*, and the unmodalized combination

(10)    I intend to arrest all the suspects, and Mr. Baker is one of the suspects,
        but I don't intend to arrest Mr.Baker.

is not semantically inconsistent, or self-contradictory, but only *pragmatically inconsistent*, or a case of *Moore's paradox*.

**3.4.** Certainly it would be highly desirable if we could find a way of devising some kind of a logical system reflecting the findings of sections 3.2 and 3.3 purely formally and, at least with a grain of salt, syntactically. As I am going to show in the rest of this paper, this will prove to be rather difficult but not downright unfeasible. In any case I believe that the attainment of such a formalized tool would be useful and of philosophical import to such an extent that it ought not to be accepted to give up this idea before having exhausted all possiblities of its realization.

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[17] I take this complex personal competence to be one of the most basic prerequisites for running combination tests according to C-CT, and for doing conceptual analysis at all; see Hoche & Strube 1985: A.IV.1.f; Hoche 1990: 141 f.

**3.5.**  Whatever the prospects are, the first step of trying to reach our aim must be the introduction of concise formal abbreviations and regimentations of the informal wordings of the sentences involved. Here is a simple way of achieving this:

> (5)  I want [intend] to arrest all the suspects,
> and I strongly believe [am convinced] that Mr. Baker is one of the suspects.

> (5')  (We) **:** (x) **.** Sx → Aex **:** & (Be) Sb;[18]

> (8)  I intend to arrest all the suspects, and Mr. Baker is one of the suspects.

> (8')  (We) **:** (x) **.** Sx → Aex **:** & Sb;

> (6)  I want [intend] to arrest Mr. Baker.

> (6')  (We) Aeb.

Then what we are looking for is a formal and, if possible, purely syntactical system which allows, among other things, a kind of 'logical derivation' of (6') from (5') and something like a 'pragmatical derivation' of (6') from (8'). As may be expected from the very beginning, this won't be attainable without a number of regimentations and idealizations, which I am going to introduce and discuss in due course.


## 4. A classical calculus of natural deduction

**4.1.** As a sound and solid groundwork for everything that will follow I am going to choose the calculus of natural deduction devised by Benson Mates for ordinary first order quantified logic.[19] On behalf of the reader's convenience I cannot help restating, though as briefly as possible, the basic idea and the basic derivation rules of this calculus. However, its formation rules and many other preliminaries may, in my opinion, safely be omitted in the present paper.

**4.2.**  By a 'derivation' in his natural deduction system, Mates understands 'a finite sequence of consecutively numbered lines, each consisting of a sentence together with a set of numbers (called the *premise-numbers* of the line), the sequence being constructed according to the following rules (in these statements φ and ψ are arbitrary formulas, α is a variable, and β is an individual constant):

> P  (Introduction of premises) Any sentence may be entered on a line, with the line number taken as the only premise number.

> T  (Tautological inference) Any sentence may be entered on a line if it is a tautological consequence of a set of sentences that appear on earlier lines; as premise-numbers of the new line take all premise-numbers of those earlier lines.

> C  (Conditionalization) The sentence (φ→ ψ) may be entered on a line if ψ appears on an

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[18] In a more widely accepted notation, we would have to render this as '(We) [(x) (Sx → Aex)] & (Be) Sb'. – Throughout this paper, my use of the basic logical connectives and quantifiers will agree with what is usual and hence need not be explained. – The letter 'e' is to stand for Latin 'ego', i.e., 'I'; so the operators '(We)' and '(Be)' may be simply read as 'I want [intend] that' and 'I believe [am convinced; am certain] that', respectively; but see also sect. 5.2, below. – In using one, two, or more *dots* instead of round, square, or still other forms of *brackets* (or else using a number of round brackets consecutively, which is now customary but, in my eyes, likely to strain the eye), I shall loosely follow Lewis & Langford 1932: Appendix I; in so doing, I shall retain their convention that the scope of a group of *n* dots is to be understood as being closed by the next group of *n* or more dots or else as extending to the end of the formula. – In order to avoid an excessive use of dots I shall follow the customary conventions for saving brackets.
[19] Mates 1965: ch. 7.

earlier line; as premise-numbers of the new line take all those of the earlier line, with the exception (if desired) of any that is the line number of a line on which φ appears.

US     (Universal specification) The sentence φα/β may be entered on a line if (α)φ appears on an earlier line; as premise-numbers of the new line take those of the earlier line.

UG     (Universal generalization) The sentence (α)φ may be entered on a line if φα/β appears on an earlier line and β occurs neither in φ nor in any premise of that earlier line; as premise-numbers of the new line take those of the earlier line.

E     (Existential quantification) The sentence (∃α)φ may be entered on a line if ¬(α)¬φ appears on an earlier line, or vice versa; as premise-numbers of the new line take those of the earlier line.

A derivation in which a sentence φ appears on the last line and all premises of that line belong to a set of sentences Γ is called *a derivation (or proof) of φ from* Γ.'[20]


## 5. Some doxastic, buletic, and pragmatic extensions of the classical calculus

**5.1.** Some years ago I suggested to add, to the preceding six rules of ordinary quantified logic (which, by virtue of rule T, implicitly also contain all the derivation rules of the propositional calculus),[21] a number of non-classical derivation rules of partly 'doxastic', partly 'buletic', and partly 'pragmatic' character.[22]

**5.2.** In order to put down these novel rules as succinctly as possible, let me make use of the following schematical abbreviations: 'φ ⊢ ψ' is to mean as much as '"ψ" can be derived from "φ" by means of the classical rules of the predicate (including the propositional) calculus (e.g., the rules listed in section 4.2, above)'. The schematical expression 'φ ⇒ ψ' is to stand for '"ψ" may be entered on a line if "φ" appears on an earlier line; as premise-numbers of the new line take those of the earlier line'. 'φ ⇔ ψ' is to serve as an abbbreviation for 'φ ⇒ ψ  and ψ ⇒ φ'. The capital letter 'B' is to abbreviate 'believe(s)'[23] in the strict sense of doxastic *certainty*, i.e., of a *strong* belief or conviction.[24] The capital letter 'W' is to stand for 'want(s)' or 'intend(s)' in the sense of being determined to do, or to make somebody do, something.[25] The personal constant 'i' is to stand for an arbitrary subject ('individual') which is capable, among other things, of believing and wanting, and the special personal constant 'e' – as an abbreviation for 'ego', 'I' – will be used as standing for respectively myself, i.e., the speaker of the sentence in which it occurs.[26] So the doxastic operator '(Bi)' is short for '(the individual person) i strongly believes [is fully convinced, or is certain] in an enlightened way that', and the buletic operator '(Wi)' is short for 'i wants [intends] in an enlightened way to [that]'.

**5.3.** Here follows my tentative list of doxastic and buletic derivation rules, which I shall arrange under five headings. – No doubt this list is *redundant*. For what can be done by means of the buletic rule of deductive closedness, RW1, can as well be done by using the doxastic rule of deductive closedness,

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[20] Ibid.: sect. 7.1, pp. 112–113. To each of the rules T and UG, Mates adds the following explanatory foot-note: '[...] to say that a sentence φ appears on a line is to say that the line consists of φ and a set of numbers; to say that a sentence φ is a premise of a given line is to say that φ appears on a line numbered by a premise-number of the given line.'. – In rule E, I changed the original form of the sentential negator.

[21] For an explicit version see ibid.: sect. 6.6.

[22] See Hoche 2001: IV.3.

[23] Cf. Hintikka 1962: 1.5.

[24] Cf. Blau 1969: 7 (and sect. 1.1); Lenzen 1980: ch. 2, passim.

[25] As will be explained in sect. 8.4, below, in what follows only a *non-spontaneous*, *considered*, and, as the case may be, *'maieutically enlightened'* mode of believing and intending is to be taken into consideration.

[26] The question of whether this – token-reflexive, or indexical – personal pronoun may in fact be also admitted in formal languages has been discussed, e.g., in Blau 1969: 3.7.1, and Barnett 1974; cf. Hoche 1992a: 148 fn. 210.

RB1, in combination with the detachment rule RW4; and the detachment rules RB2 and RW2 can be obtained from the conjunction rules RB5 and RW7, respectively, on condition that we accept the deductive closedness rules. None the less, the rules in question are useful as short cut rules. − What I am going to discuss in this paper is the much more important question of whether the list is *correct*. This may be doubted; for in some special cases it permits the derivation of sentences which are usually taken *not* to be semantically implied by their premises according to C-CT None the less I hope I will be able to eventually show that the paradoxes which seem to be engendered by this fact are but *apparent* ones (see section 12, below).

Deductive closedness rules:

> RB1    If  $\varphi \vdash \psi$  then  (Bi) $\varphi$  $\Rightarrow$ (Bi) $\psi$;
> RW1    If  $\varphi \vdash \psi$  then  (Wi) $\varphi$  $\Rightarrow$ (Wi) $\psi$.

Detachment rules (variants of *modus ponens*):

> RB2    (Bi) $. \varphi \to \psi .$ & (Bi) $\varphi$  $\Rightarrow$ (Bi) $\psi$;
> RW2    (Wi) $. \varphi \to \psi .$ & (Wi) $\varphi$  $\Rightarrow$ (Wi) $\psi$;
> RW3    (Wi) $. \varphi \to \psi .$ & (Bi) $\varphi$  $\Rightarrow$ (Wi) $\psi$;
> RW4    (Bi) $. \varphi \to \psi .$ & (Wi) $\varphi$  $\Rightarrow$ (Wi) $\psi$.

Operator rules:

> RB3    (Bi) $\varphi$        $\Leftrightarrow$ (Bi) $.$ (Bi) $\varphi$;
> RW5    (Wi) $\varphi$        $\Leftrightarrow$ (Bi) $.$ (Wi) $\varphi$;
> RB4    $\neg$ (Bi) $\varphi$   $\Leftrightarrow$ (Bi) $. \neg$ (Bi) $\varphi$;
> RW6    $\neg$ (Wi) $\varphi$   $\Leftrightarrow$ (Bi) $. \neg$ (Wi) $\varphi$.

Conjunction rules:

> RB5    (Bi) $\varphi$ & (Bi) $\psi$    $\Leftrightarrow$ (Bi) $. \varphi$ & $\psi$;
> RW7    (Wi) $\varphi$ & (Wi) $\psi$   $\Leftrightarrow$ (Wi) $. \varphi$ & $\psi$.

Negation rules:

> RB6    (Bi) $\neg \varphi$  $\Rightarrow$ $\neg$ (Bi) $\varphi$;
> RW8    (Wi) $\neg \varphi$  $\Rightarrow$ $\neg$ (Wi) $\varphi$.

**5.4.**  If these novel derivation rules are acceptable, the calculus making use of them will allow us to derive *true* propositions from *true* propositions, just as in the classical logical calculi. But we may also think of a natural deduction system which is designed to derive, not true propositions from true ones, but *assertible* propositions from *assertible* ones. Such a *calculus of warranted assertibility*, as we may aptly call it, can be achieved by simply adding, to the rules already listed, the 'pragmatic rule'

> RP    $\varphi \Rightarrow$ (Be) $\varphi$.[27]

The rationale of this additional rule is, of course, that whenever I am *justified in asserting* an interpreted sentence '$\varphi$', I am also *justified in asserting* the accordingly interpreted sentence 'I

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[27] It should be noted, however, that for a *logically true* sentence T the rule 'T $\Rightarrow$ (Be) T' – and even the more general rule 'T $\Rightarrow$ (Bi) T' – hold good also in purely *logical* (i.e., truth preserving ) calculi. But of course they are merely special cases of  RB1 ('If $\varphi \vdash \psi$ then (Bi) $\varphi \Rightarrow$ (Bi) $\psi$'): For any arbitrary sentence '$\varphi$', we have '$\varphi \vdash$ T', hence, according to RB1, also '(Bi) $\varphi \Rightarrow$ (Bi) T': If somebody is convinced of *anything at all* – which we cannot help claiming for every person who is to qualify as a subject of believing and intending – then he is convinced of T as well.

strongly believe [I have the strong conviction; I am certain] that φ'. This is the essential core of 'Moore's paradox' in its original, best-known form and can be systematically verified by means of a combination test, i.e., by applying our criterion C-CT to suitable forms of sentences.[28]

## 6. Where the  extended system works

**6.1.** We can easily convince ourselves that our extended formal system serves at least the purpose for which it has been designed: It permits us to derive

> (6')    (We) Aeb

from

> (5')    (We) **:** (x) **.** Sx → Aex **:** & (Be) Sb

*semantically* and from

> (8')    (We) **:** (x) **.** Sx → Aex **:** & Sb

*pragmatically*:

| | | | |
|---|---|---|---|
| {1} | [1] | (We) **:** (x) **.** Sx → Aex **:** & (Be) Sb | P |
| {1} | [2] | (We) **:** (x) **.** Sx → Aex | [1]T |
| {1} | [3] | (Be) Sb | [1]T |
| {4} | [4] | (x) **.** Sx → Aex | P |
| {4} | [5] | Sb → Aeb | [4]US |
| {0} | [6] | (x) **.** Sx → Aex **.** → **.** Sb → Aeb | [4],[5]C |
| {0} | [7] | (Be) **:** (x) **.** Sx → Aex **.** → **.** Sb → Aeb | [6]RB1 |
| {1} | [8] | (We) **.** Sb → Aeb | [2],[7]RW4 |
| {1} | [9] | (We) Aeb | [3],[8]RW3 |
| | | | |
| {1} | [1] | (We) **:** (x) **.** Sx → Aex **:** & Sb | P |
| {1} | [2] | (We) **:** (x) **.** Sx → Aex | [1]T |
| {1} | [3] | Sb | [1]T |
| {1} | [4] | (Be) Sb | RP |
| {5} | [5] | (x) **.** Sx → Aex | P |
| {5} | [6] | Sb → Aeb | [5]US |
| {0} | [7] | (x) **.** Sx → Aex **.** → **.** Sb → Aeb | [5],[6]C |
| {0} | [8] | (Be) **:** (x) **.** Sx → Aex **.** → **.** Sb → Aeb | [6]RB1 |
| {1} | [9] | (We) **.** Sb → Aeb | [2],[8]RW4 |
| {1} | [10] | (We) Aeb | [4],[9]RW3 |

**6.2.** Now suppose that our combined imaginative and idiolectic competence speaks in favour of analyzing the ordinary-language sentence form

> (11)    (According to my personal normative standards) I (morally) ought to do $a_o$.

as concisely as possible[29] in the following way (which in my personal view it certainly does):[30]

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[28] See sects. 2.2–2.3, above.

[29] It is obvious that here, as in all other cases which are not extraordinarily simple, there is more than just *one* possible degree of depth (or 'shallowness': see Quine 1960: § 33, p. 160) of conceptual analysis.

[30] For a circumstantial justification of this analysis, see Hoche 1992a: chs. 2–3; 2001: sects. VIII–X.

(11')  (We) **:** (z,a) **.** (Bz) $R_o$za → z do a **:** & (Be) $R_o$ea$_o$.

Then, in virtue of our tentatively extended formal system, we are also in a position to derive, from a formalized 'ought'-sentence of form (11'), a formalized sentence of form

(12')  (We) e do a$_o$,

which I am going to use as the symbolic counterpart of the ordinary-language sentence form

(12)  I intend to do (action) a.:

| {1} | [1] | (We) **:** (z,a) **.** (Bz) $R_o$za → z do a **:** & (Be) $R_o$ea$_o$ | P |
|---|---|---|---|
| {1} | [2] | (We) **:** (z,a) **.** (Bz) $R_o$za → z do a | [1]T |
| {1} | [3] | (Be) $R_o$ea$_o$ | [1]T |
| {4} | [4] | (z,a) **.** (Bz) $R_o$za → z do a | P |
| {4} | [5] | (Be) $R_o$ea$_o$ → e do a$_o$ | [4]US |
| {0} | [6] | (z,a) **.** (Bz) $R_o$za → z do a **.** → **.** (Be) $R_o$ea$_o$ → e do a$_o$ | [4],[5]C |
| {0} | [7] | (Be) **:** (z,a) **.** (Bz) $R_o$za → z do a **.** → **.** (Be) $R_o$ea$_o$ → e do a$_o$ | [6]RB1 |
| {1} | [8] | (We) **.** (Be) $R_o$ea$_o$ → e do a$_o$ | [2],[7]RW4 |
| {1} | [9] | (Be) **.** (Be) $R_o$ea$_o$ | [3]RB3 |
| {1} | [10] | (We) e do a$_o$ | [8],[9]RW3 |

This semantic derivation mirrors the fact that, according to C-CT, a moral 'ought'-sentence in the first grammatical person implies the corresponding 'I intend'-sentence semantically, which I regard as the criterion for the 'prescriptivity' of a moral 'I ought'-sentence.[31]

## 7. Where the extended system seems to yield paradoxes

**7.1.**  It may seem, however, that the derivations which our system permits are not always backed up by corresponding implications according to C-CT. Take, e.g., the sentences

(13)  Mother wants little John to eat up his porridge.

(14)  Mother wants little John to drink a bottle of rum if he doesn't eat up his porridge.

At first sight, by assenting to (13) I certainly do not seem to commit myself to assenting to (14), too. If so, according to C-CT (14) is implied by (13) neither linguistically in the generic sense nor, *a fortiori*, semantically. And yet our tentatively extended system admits a semantical derivation of the formal analysans of (14) from the formal analysans of (13):[32]

| {1} | [1] | (Wm) Pj | P |
|---|---|---|---|
| {2} | [2] | Pj | P |
| {2} | [3] | ¬ Pj → Rj | [2]T |
| {0} | [4] | Pj → **.** ¬ Pj → Rj | [2],[3]C |
| {0} | [5] | (Bm) **:** Pj → **.** ¬ Pj → Rj | [4]RB1 |
| {1} | [6] | (Wm) **.** ¬ Pj → Rj | [1],[5]RW4 |

**7.2.**  There are other strange looking derivations, too. Consider, e.g., the following case, which is a quantified variant of the example in section 7.1:[33]

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[31] As I said in sect. 3.1, above, in my version of Universal Prescriptivism the either semantic or pragmatic implication of 'I intend'-sentences takes the place of Hare's 'entailment' (which ought rather to mean: catapragmatic implication) of the corresponding imperative.

[32] I owe this kind of example to Takahashi 2000.

[33] I owe this kind of example to Knoop 2002.

| {1} | [1] | (Wi) **:** (x) **.** Lx $\rightarrow$ Px | P |
|---|---|---|---|
| {2} | [2] | (x) **.** Lx $\rightarrow$ Px | P |
| {2} | [3] | La $\rightarrow$ Pa | [2]US |
| {4} | [4] | La | P |
| {2,4} | [5] | Pa | [3],[4]T |
| {2,4} | [6] | Pa v Ba | [5]T |
| {2} | [7] | La $\rightarrow$ Pa v Ba | [4],[6]C |
| {2} | [8] | (x) **.** Lx $\rightarrow$ Px v Bx | [7]UG |
| {0} | [9] | (x) **.** Lx $\rightarrow$ Px **.** $\rightarrow$ **:** (x) **.** Lx $\rightarrow$ Px v Bx | [2],[8]C |
| {0} | [10] | (Bi) **:.** (x) **.** Lx $\rightarrow$ Px **.** $\rightarrow$ **:** (x) **.** Lx $\rightarrow$ Px v Bx | [9]RB1 |
| {1} | [11] | (Wi) **:** (x) **.** Lx $\rightarrow$ Px v Bx | [1],[10]RW4 |

We can interpret this as deriving, e.g., the sentence

>  (15)    Ian wants all the letters to be posted or burned.

from the sentence

>  (16)    Ian wants all the letters to be posted.

However, at first blush (16) doesn't seem to imply (15) linguistically, let alone semantically; for most probably we feel quite sure that we can assent to (16) without having to assent to (15), too.[34]


### 8. How to prove the correctness of the derivation rules of the extended system

**8.1.**   So there is at least an initial suspicion that not all of the derivation rules tentatively listed in section 5.3, above, and just applied in the doubtful derivations in section 7 are correct. – Let us first raise the question of how to prove *at all* the correctness of the derivation rules of our extended system. I take it that the classical method used in the propositional calculus, in ordinary predicate logic, and in alethic modal calculi does not work for the following two reasons: First, in our integrated system we have needs to do with *two independent* non-classical operators, the doxastic operator '(Bi)' and the buletic operator '(Wi)', which cannot be reduced to each other by means of applying external and/or internal negation, and thus are *equally basic*. Second, at least as far as the 'pragmatic rule' RP is involved, the central concept of our extended system is not truth but something like *'warranted assertibility'*.[35]

**8.2.** So I, for one, cannot now conceive of any other way of justifying the non-classical derivation rules of our extended system besides carrying through, on the basis of our criterion C-CT, appropriate combination tests with relevant forms of ordinary-language sentences. A mathematically-minded logician may find this repulsive; philosophers, however, especially those devoted to the logical or conceptual analysis of expressions of everyday language, simply cannot content themselves with the unobjectionable and, as it were, chemically pure kinds of mathematical logics developed so far. Of course, the resulting systems of a 'merely philosophical logic' may differ from the usual mathematical logics so widely as to require a different name, e.g., the name of a 'quasi-logic'. But I am confident that a 'quasi-logic' does not automatically deserve to be discredited as a mere 'pseudo-logic'. The only alternative we seem to me to have is giving up, once for all, the hope of applying a 'formalized rationality' to essential parts of philosophy such as, in the present case, analytical metaethics.

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[34] This is a quantified and buletic counterpart of a propositional and imperative-logical paradox discussed, among others, by Hare 1967.

[35] See, e.g., Dummett 1978: 362–365, 370 f.; cf. 17–19, 176, 178, 184 f.

**8.3.** Elsewhere I have tried to justify the more important of my buletic derivation rules,[36] and I do not intend to do this at great length once again. Suffice it to have a look at one of the most frequently used buletic detachment rules,

$$\text{RW4} \quad (\text{Bi}) \,.\, \varphi \to \psi \,.\, \& \, (\text{Wi}) \, \varphi \;\Rightarrow (\text{Wi}) \, \psi.$$

What we have to show is that, according to C-CT, an ordinary-language sentence of the form

$$(17\text{'}) \quad (\text{Bi}) \,.\, \varphi \to \psi \,.\, \& \, (\text{Wi}) \, \varphi,$$

say,

(17)   Inspector Ingram believes that the instigators will escape if he arrests the suspect, and he intends to arrest the suspect.,

semantically implies an ordinary-language sentence of the form

$$(18\text{'}) \quad (\text{Wi}) \, \psi,$$

say,

(18)   Inspector Ingram intends the instigators to escape.

There seems to me to be no question that this is the case. For if someone assents to (17) and at the same time refuses to assent to (18), I think we could not help grading his linguistic behaviour as highly absurd; and given we can make sure that his command of the non-buletic and non-doxastic parts of the wordings is all right, we would be inclined to say that it makes no sense to ascribe to him the ordinary understanding and mastership of the verbs 'to believe [to be convinced; to be certain]' and/or 'to intend [to want]'. So (17) implies (18) linguistically in the generic sense. Furthermore, according to my personal imaginative and idiolectic competence, the modalized combination

(19)   I can conceive of a situation with respect to which I am prepared to say here and now that Inspector Ingram believes that the instigators will escape if he arrests the suspect, and that he intends to arrest the suspect., but that none the less he doesn't intend the instigators to escape.

is certainly *false*. So, according to C-CT, the linguistic implication of (18) by (17) is of the *semantic* kind. Le me finally state that this result obviously does not depend on the specific example chosen and thus may be taken to be valid for the *forms* of sentences tested, i.e., for (17') and (18').

**8.4.** Against this outcome of our combination test one may be inclined to object that human beings often speak and think (e.g., believe and intend) in a somewhat irrational manner. Of course this is true enough. But as long as we provide for this kind of spontaneous irrationality, something like a logic of believing and willing cannot even be *launched*; for everybody's everyday absent-mindedness would suffice to call in question even the simplest linguistic implications. So it is to be understood that an integrated doxastic and buletic logic, if it is to work at all, has to be based on the concepts of *non-spontaneous*, *considered*, and possibly *maieutically enlightened* believing and intending. It is true that we cannot find out what someone else believes and intends if not on the basis of what he says and does in a given situation; but for the purposes of our extended logic, his verbal and non-verbal behaviour is of any relevance only on condition that we give him the chance of pondering and correcting his spontaneous and rash reactions. But how to judge someone who stubbornly abides by his strange linguistic behaviour even after we have pointed out to him the implications of what he has said? I think in such a case we would say that he uses the verbs of believing and intending in a way widely different from the generally accepted one, and hence that he is not entitled to be regarded as an

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[36] See Hoche 1992a: 2.9 (esp. pp. 159–165), 4.1 (esp. pp. 257 f.); 1999: 2.2–2.6.

authority in questions concerning believing and intending – in a word: that in the present context he simply 'doesn't count'.

## 9. Some problems concerning the rules of deductive closedness

**9.1.** That an integrated logic of conviction and intention has to focus exclusively on the *non-spontaneous*, *considered*, and possibly *maieutically enlightened* modes of believing and intending, and thus may totally disregard those well-known everyday variants of these mental states which fall short of this ideal standard of rationality, is of especial import in the case of our two rules of deductive closedness, to wit,

RB1    If  $\varphi \vdash \psi$  then  (Bi) $\varphi \Rightarrow$ (Bi) $\psi$;
RW1    If  $\varphi \vdash \psi$  then  (Wi) $\varphi \Rightarrow$ (Wi) $\psi$.

For of course nobody believes the totality of the endlessly branching logical consequences of those convictions which he presently happens to have in an empirical and manifest manner unless we speak of believing in the *non-spontaneous*, *considered*, and possibly *maieutically enlightened* mode. Similarly, nobody wants, in a non-ideal mode, all the consequences of what he factually wants at any given moment of his life. If this were otherwise, our theories and our actions would be of a rationality unheard-of; *inter alia*, there would be no need of logical and mathematical proofs, and nobody would ever manoeuvre himself into a position compelling him to regret unwise decisions.

**9.2.** So a popular and near at hand way of finding fault with our two rules of deductive closedness ought to be blocked. But none the less these two rules might be thought to lie at the root of the real or seeming difficulties I have exposed in section 7, above. To make this obvious, let me first call your attention to a corollary of RB1, viz., that everyone who counts as a subject of believing in the non-spontaneous, considered, and possible maieutically enlightened mode believes all logical truths: For every ideal believer, i, if  $\vdash \psi$  then (Bi) $\psi$. This follows from RB1 by virtue of the definition of a logical truth as being a truth that can be derived, in a classical logical calculus, from the empty set of premises, or, what amounts to the same thing, from any premise whatsoever. So if someone believes something at all – which goes without saying for him who may count as a subject of believing – he may be taken to believe, in the relevant mode, any logical truth whatsoever. If we use 'T' as a schematic letter for any logical truth, we can put down our corollary also in the following simple form: For every ideal believer, (Bi) T. Now let us weaken this form by means of two of our tentative derivation rules (in an abbreviated procedure):

| | | | |
|---|---|---|---|
| {0} | [1] | (Bi) T | RB1 |
| {0} | [2] | (Bi) $\neg \neg$ T | [1]RB1 |
| {0} | [3] | $\neg$ (Bi) $\neg$ T | [2]RB6 |

This short derivation shows that if a sentence of the form '(Bi) T' is true, which we have to accept on the basis of RB1, then also a sentence of the form ' $\neg$ (Bi) $\neg$ T' is true, and from this it follows, furthermore, that the corresponding negation '(Bi) $\neg$ T' or – what is to mean the same – '(Bi) $\bot$' is false, or that no ideal or rational believer ever believes a logical falsehood to be true.

**9.3.** Similarly we are naturally inclined to think that, by parity of reasoning, we may also derive, from the buletic rule of deductive closedness, RW1, the corollary '(Wi) T' and from this ' $\neg$ (Wi) $\neg$ T', and hence to conclude that '(Wi) $\neg$ T' must be false:

| | | | |
|---|---|---|---|
| {0} | [1] | (Wi) T | RW1 |
| {0} | [2] | (Wi) $\neg \neg$ T | [1]RW1 |
| {0} | [3] | $\neg$ (Wi) $\neg$ T | [2]RW8 |

But is this acceptable? Can we really parallel our statements of section 9.2 and claim that for every ideal 'intender', i, if ⊢ ψ then (Wi) ψ, or (Wi) T, and hence that for every ideal 'intender', i, '(Wi) ⊥' must be false? Possibly not; but let us scrutinize this question.

### 10. A doubtful attempt to overcome the paradoxes of buletic logic: The pros and cons of a formation rule to the effect that a buletic operator must not govern a non-action sentence

**10.1.**  Bearing in mind that by wanting or intending we mean something very different from merely wishing or desiring (or 'willing' in this sense),[37] we should be aware of the fact that, whereas we can believe (and also wish) *anything* (provided it is not logically false), strictly speaking we can want or intend only *actions* and *results (consequences, effects) of actions*. Therefore it may seem that the buletic operator '(Wi)' ought to be prefixed only to sentences which are either straightforward action-sentences or can at least be construed as action-sentences.[38] Now of course we need a criterion for being an action; but as I have suggested already a long time ago,[39] there presents itself a 'speech-act criterion' which is completely independent of any specific sorts of actions (notably bodily actions) and according to which we may count to be an action whatever we can ask someone to do, or promise to do ourselves, or for which we can thank someone, or blame someone, or excuse ourselves, and so on.[40] We can easily convince ourselves that, according to this speech-act criterion of action, neither a logically true sentence nor a logically false sentence can be regarded as an action-sentence; for we cannot ask someone to do, or promise to do ourselves, what is 'true in all possible worlds' or else what is 'true in no possible world'. So in devising an integrated logic of conviction and intention, we should probe the question of introducing a *formation rule* to the effect that the buletic operator '(Wi)' must not be prefixed to a non-action sentence, especially not to a logically determined sentence.[41] In case this suggestion turns out to be workable we would have to regard all the forms written down in section 9.3 as being 'buletically ill-formed'. Since *formation rules* certainly have to take precedence of *transformation rules*, in this case our transformation rules, notably the rules of deductive closure, would meet with certain restrictions.

**10.2.**  Supposing for the moment that the suggestion just put forward in section 10.1 proves to be practicable, let us ask ourselves whether, on this basis, we could avoid the strange looking derivations presented in section 7. First, let us have a closer look at the derivation in section 7.1, which we may put down schematically like this:

| | | | |
|---|---|---|---|
| {1} | [1] | (Wi) φ | P |
| {2} | [2] | φ | P |
| {2} | [3] | ¬ φ → ψ | [2]T |
| {0} | [4] | φ → . ¬ φ → ψ | [2],[3]C |
| {0} | [5] | (Bi) : φ → . ¬ φ → ψ | [4]RB1 |
| {1} | [6] | (Wi) . ¬ φ → ψ | [1],[5]RW4 |

---

[37] By the way, this is the reason why it is not at all advisable to speak of a 'logic of willing' instead of a buletic logic, or a logic of intention. Furthermore, to drive home this important point to the reader once again, we should not forget that a logic of intention can only be realized as an integrated logic of conviction and intention; for intending is parasitic upon believing and hence cannot be made the isolated object of something even *resembling* a logical system. In my view, this has been unintentionally demonstrated by the poor results of Wohlhueter 1974, who tried to devise a 'pure' logic of wanting without regarding its essential connection with believing.

[38] For instance, the sentence 'I want the door to be closed.' may be construed as 'I want that someone closes the door, or sees to it that the door is kept closed.'.

[39] Hoche 1973: 112–114; cf. 1992a: 116 fn. 170.

[40] See also Searle 1983: 81, who makes the possibility of forming an imperative mood the criterion of being a verb of action.

[41] In fact, 1992a: 154 fn. 215, 157 fn. 220, and 2001: IV.3, I recommended to introduce such a formation rule into the formal ('axiomatic') construction of an integrated logic of conviction and intention; however, it has never been my ambition to realize such an ambitious project myself, which I should like to leave to experts in the fields of formal logics and metalogics.

In line [3] we make use of a variant of what is sometimes called Duns Scotus' Law. There, the implicated partial sentence '$\psi$' is completely *arbitrary*; any other sentence can be substituted for it, *inter alia* its negation, '$\neg\psi$'. Furthermore, we can retain line [3] and insert an additional line in which '$\psi$' is replaced with '$\neg\psi$'. So we can construct the following derivation:

| | | | |
|---|---|---|---|
| {1} | [1] | (Wi) $\varphi$ | P |
| {2} | [2] | $\varphi$ | P |
| {2} | [3] | $\neg\varphi \rightarrow \psi$ | [2]T |
| {2} | [4] | $\neg\varphi \rightarrow \neg\psi$ | [2]T |
| {2} | [5] | $\neg\varphi \rightarrow \psi\,.\,\&\,.\,\neg\varphi \rightarrow \neg\psi$ | [3],[4]T |
| {2} | [6] | $\neg\varphi \rightarrow\,.\,\psi\,\&\,\neg\psi$ | [5]T |
| {0} | [7] | $\varphi \rightarrow\,:\,\neg\varphi \rightarrow\,.\,\psi\,\&\,\neg\psi$ | [2],[6]C |
| {0} | [8] | (Bi) $:\varphi \rightarrow\,:\,\neg\varphi \rightarrow\,.\,\psi\,\&\,\neg\psi$ | [7]RB1 |
| {1} | [9] | (Wi) $:\neg\varphi \rightarrow\,.\,\psi\,\&\,\neg\psi$ | [1],[8]RW4 |

In view of this derivation we may think of arguing as follows: It is true that in the concluding line, [9], the buletic operator '(Wi)' does not precede, or govern, a *logically determined sentence*. However, it is prefixed to a (contingent) *non-action sentence*; for by means of the sentence put down in [9] we state the nonsense that the 'believer-intender' i wants the logical falsity (impossibility) '$\psi\,\&\,\neg\psi$' to be done on condition that '$\neg\varphi$' is true, and this certainly offends against the spirit of the buletic formation rule pondered in section 10.1. So the sentence in line [9] is buletically ill-formed and has to be rejected. Therefore, we have to reject either line [1]or else line [8] or else the detachment rule RW4 (see the notes at the extreme right of line [9]). But certainly an approved derivation rule should not be given up without a truly compelling reason; so neither RW4 nor line [1] should be rejected, for rejecting the latter amounts to hurting our derivation rule P. So what ought to be disposed of in this case is line [8]. Working our way back, we may apply similar considerations until we refuse to accept line [5]. If we continue sticking to useful derivation rules, in this case the rule that we can always proceed from two given sentences to their conjunction, then we have to give up either line [3] or line [4]. But since these two lines have been arrived at in exactly the same way, to wit, according to Duns Scotus' Law, we have to reject either both or none of them. This I take to be an application of what is sometimes called the principle of 'parity of reasoning'.[42] So here we seem to have the weakest link in our problematic derivation chain, and this may seem to speak in favour of restricting the transformation rule T in somewhat the spirit of relevance logic and excluding, *inter alia*, such applications of rule T as Duns Scotus or the closely related adjunctive weakening, i.e., the passage from a sentence '$\varphi$' to a sentence '$\varphi\,v\,\psi$' in which '$\psi$' is quite arbitrary. Note, however, that this does not amount to suggesting the exclusion of such arbitrary and hence 'irrelevant' partial sentences *throughout* a derivation;[43] rather, I am only thinking about the prospects of banning the insertion of completely arbitrary partial sentences, as it occurs in Duns Scotus and adjunctive weakening, in such *fragments* of a derivation in which either RW1 or the combination of RB1 with RW4 is at work.

**10.3.** However, I do not intend to take pains with devising a workable formulation of the possible restrictions of T just considered. For there seems to be a grave objection against my suggestion to preclude, by way of introducing a syntactic formation rule, the prefixing of buletic operators to non-action sentences and more specifically to logically determined ones. This objection is based upon the undecidability of the predicate calculus: Since there is no effective procedure of proving for all sentences '$\varphi$' and '$\psi$' of this calculus whether the latter one can be derived from the former one, and hence of proving whether any given sentence is logically determined or else contingent, the buletic formation rules would be made dependent on the intrinsic lacunae of the predicate calculus: We could

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[42] I take this principle, which seems to date back to scholastic philosophy, to be extremely fertile. For instance, in Hoche 1995d: 1.3, I made use of it in the course of an argument in favour of a solution to the mind-body problem which is neither monistic nor dualistic but 'complementaristic' in much the sense of Niels Bohr.

[43] Possibly, the latter suggestion, i. e., using some form of relevance logic throughout, may be thought to be a more promising basis for the development of an integrated logic of conviction and intention. I do not think so, however; for my findings in sect. 12, below, seem to me to imply that relevance logic is basically unjustified.

never know for sure to which sentences we may, and to which sentences we may not, prefix a buletic operator. This would certainly make up a serious disadvantage, if not a downright impediment, for the formal ('axiomatic') construction of the integrated calculus of believing and intending which we are trying to launch.

**10.4.** So, for the sake of the possibility of a flawless formalization of the novel logic which we are looking for, it appears to be preferable to reject the informal considerations made in section 10.1, however plausible they certainly look at first sight, and to abide by the corollaries drawn from the closedness rule RW1 in section 9.3, which exactly parallel the corollaries drawn from the closedness rule RB1 in section 9.2.

### 11. A second attempt:
### The paradoxes of buletic logic can be shown to be no more virulent than are the corresponding paradoxes of doxastic logic and of the classical propositional calculus

**11.1.** Next, let us ask ourselves whether the derivations exposed in section 7, above, are *in fact*, and not *only seemingly*, more paradoxical than are the analogous derivations in the classical propositional calculus, which the majority of logicians are prepared to tolerate. So let us look anew at the problematic derivation of section 7.1 in the following simplified form, used already in section 10.2:

| | | | |
|---|---|---|---|
| {1} | [1] | (Wi) $\varphi$ | P |
| {2} | [2] | $\varphi$ | P |
| {2} | [3] | $\neg \varphi \rightarrow \psi$ | [2]T |
| {0} | [4] | $\varphi \rightarrow . \neg \varphi \rightarrow \psi$ | [2],[3]C |
| {0} | [5] | (Bi) $: \varphi \rightarrow . \neg \varphi \rightarrow \psi$ | [4]RB1 |
| {1} | [6] | (Wi) $. \neg \varphi \rightarrow \psi$ | [1],[5]RW4 |

At first sight this derivation may appear to be considerably more paradoxical than its 'propositional kernel', viz.,

| | | | |
|---|---|---|---|
| {1} | [1] | $\varphi$ | P |
| {1} | [2] | $\neg \varphi \rightarrow \psi$ | [1]T |

**11.2.** None the less I think that this tiny derivation is likely to look paradoxical, too. For if we apply a combination test according to C-CT to a pair of ordinary-language sentences of the two forms involved, say, to the sentences

(20)    John will stay at home.

(21)    If John won't stay at home he will be visiting Jane.,

at least initially and spontaneously we may feel that if and when we assent to (20) we need by no means assent to (21) as well. Provided that this first impression can be corroborated, we cannot help conceding that (20) implies (21) not even linguistically at large, let alone semantically, and that therefore the two-line-derivation just exposed in section 11.1 is paradoxical. Anyhow, the paradoxical air of this derivation will be considerably mitigated if we keep in mind that (21) is nothing but a weakening or watering down of (20), which keeps its full strength or 'assertive force', so that the negation

(¬20)   John won't stay at home.,

which would permit us, by way of modus ponens, to detach

(22)    John will be visiting Jane.,

is not at our disposal. In other words: Because it is not possible that John *will* stay at home and at the same time *won't* stay at home, the condition on which, according to (21), he will be visiting Jane cannot be realized, and so the conditional statement (21) is of no consequence whatsoever.

**11.3.** At first sight this may seem to be different in the buletic counterpart of the purely propositional derivation; for if we derive, from a sentence such as

(23)     Jane wants John to stay at home.,

any such sentence such as

(24)     Jane wants John to visit her if he doesn't stay at home.,

it is surely natural to take the latter sentence as meaning that Jane, though in fact originally and primarily intending John to stay at home, nonetheless wants John to visit her in case he does not, and possibly cannot, do what she intends him to do in the first place; and doubtless this subsidiary intention of hers – this second-best alternative – would be quite different from the one expressed by, say,

(25)     Jane wants John to visit Dorothy if he doesn't stay at home.

In other words: Although Jane intends John to stay at home it may well occur that John does not, and possibly cannot, comply with Jane's intention, and thus a detachment seems to be feasable: From (23) and

(26)     John doesn't stay at home.,

which is doubtless compatible with (23), it seems that we may detach either

(27)     Jane wants John to visit her.

or anything else, which may be widely different, such as

(28)     Jane wants John to visit Dorothy.

**11.4.** In this respect, the following purely doxastic derivation at first sight seems to resemble more closely the derivation in the classical propositional calculus than the buletic derivation just considered:

| | | | |
|---|---|---|---|
| {1} | [1] | (Bi) $\varphi$ | P |
| {2} | [2] | $\varphi$ | P |
| {2} | [3] | $\neg \varphi \to \psi$ | [2]T |
| {0} | [4] | $\varphi \to . \neg \varphi \to \psi$ | [2],[3]C |
| {0} | [5] | (Bi) $: \varphi \to . \neg \varphi \to \psi$ | [4]RB1 |
| {1} | [6] | (Bi) $. \neg \varphi \to \psi$ | [1],[5]RG2 |

For if i believes '$\varphi$' to be the case (line [1]), he or she does not believe that '$\neg \varphi$' is the case,[44] and so a detachment of '(Bi) $\psi$' from '(Bi) $. \neg \varphi \to \psi$' by means of our rule RB2 is not possible. For example, though we can derive, from a sentence such as

(29)     Jane believes John to stay at home.,

any such sentence as

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[44] This can be seen by means of a procedure similar to the one used in sect. 9.2, above.

(30)     Jane believes John to visit her if he doesn't stay at home.

we cannot detach from the latter sentence the sentence

(31)     Jane believes John to visit her.

for the simple reason that Jane, because of the retained truth of (29), does not believe that John doesn't stay at home.

**11.5.** A closer look is apt to teach us, however, that the difference between the buletic case on the one hand and the doxastic case as well as the propositional case on the other hand is much less important than at first sight it seemed to be, and in fact that this difference disappears for the following reason. From the point of view of a purely intuitive action theory, which need not make allowances for the requirements of formal logic, we may take it for granted that if someone really wants (and not only wishes) something to be done he is not at the same time certain that it will be done, nor that it will not be done. Suppose, for example, Jane wants John to stay at home. Then she is neither certain that he will stay at home (for otherwise, in her eyes her wanting so would be futile because *superfluous*) nor certain that he won't stay at home (for otherwise, in her eyes her wanting so would be futile because *useless*). From the point of view of formal logic, however, which sometimes forces us to curb our intituive insights, things look somewhat different. For as we have seen in section 10.3, above, on behalf of the prospects of an axiomatic construction of buletic logic we have to admit of limiting cases in which we can be said to want, or intend, something to be the case which is no 'action-event'[45] and possibly even a logically true state of affairs. Now, according to our deductive closedness rule RB1, such a logical truth is always believed to be true by the rational believer-intender whom we have needs to presuppose if we are going to do buletic logic, and so the first part of our intuitive insight has to be left out of consideration. But its second part remains untouched and can even be proved by means of the rules of our extended system:[46]

| | | | |
|---|---|---|---:|
| {1} | [1] | (Wi) $\varphi$ | P |
| {2} | [2] | $\neg \varphi$ | P |
| {2} | [3] | $\neg \varphi$ | [2]T |
| {0} | [4] | $\neg \varphi \rightarrow \neg \varphi$ | [2],[3]C |
| {0} | [5] | (Wi) . $\neg \varphi \rightarrow \neg \varphi$ | [4]RW1 |
| {6} | [6] | (Bi) $\neg \varphi$ | P |
| {6} | [7] | (Wi) $\neg \varphi$ | [5],[6]RW3 |
| {6} | [8] | $\neg$ (Wi) $\varphi$ | [7]RW8 |
| {0} | [9] | (Bi) $\neg \varphi \rightarrow \neg$ (Wi) $\varphi$ | [6],[8]C |
| {0} | [10] | (Wi) $\varphi \rightarrow \neg$ (Bi) $\neg \varphi$ | [9]T |
| {1} | [11] | $\neg$ (Bi) $\neg \varphi$ | [1],[10]T |

Now we can easily convince ourselves that the rules of our extended system listed in section 5.3, above, do not permit the detachment of the unconditional buletic sentence '(Wi) $\psi$' from the conditional buletic sentence '(Wi) . $\neg \varphi \rightarrow \psi$' which we have arrived at in the concluding line, [6], of our derivation in sect. 11.1, above. For this detachment cannot be brought about unless by using either RW2 or RW3, i.e., by means of either '(Wi) $\neg \varphi$' or '(Bi) $\neg \varphi$'. However, '(Wi) $\neg \varphi$' would be inconsistent with '$\neg$ (Wi) $\neg \varphi$', which is derivable from '(Wi) $\varphi$' in line [1] of our derivation in sect. 11.1,[47] and '(Bi) $\neg \varphi$' would be inconsistent with '$\neg$ (Bi) $\neg \varphi$', which we saw right now to be likewise

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[45] In the present context, by an 'action-event' I understand the event of which the intended action consists in the 'third-person perspective' of someone else observing the intending and acting subject. So my present use of the word differs from the one to be found in some writings of Donald Davidson and others.

[46] I owe this derivation and the way it is made use of in the subsequent paragraph to Knoop 2003b. – The fact that this derivation is possible may be taken to be an indicator for the efficiency of my tentative system.

[47] This can be seen by means of a procedure similar to the one used in sect. 9.3, above.

derivable from '(Wi) φ'.[48] So the detachment of '(Wi) ψ' has to be judged to be no less impossible than the detachment of '(Bi) ψ' in the doxastic derivation in section 11.4, or the detachment of 'ψ' in the short propositional derivation in section 11.1. For this reason we need not think any longer our tentative list of buletic as well as doxastic rules to be incorrect. In the worst case it is at least no more incorrect than are the doxastic calculi of the garden variety, and in fact no more incorrect than is the classical propositional calculus.

**11.6.** However, in order to remove a doubt possibly still lingering in the background, let us scrutinize an apparent incompatibility between two lines of argument used above. In section 11.3 I stated, plausibly enough, that in spite of Jane's intending John to stay at home it is very well possible that John does not comply with Jane's intention; but in section 11.5, I stated that if someone really wants (and not only wishes) something to be done he is not at the same time certain that it will be done, nor that it will not be done, and more specifically that, if Jane wants John to stay at home, she is neither certain that he will stay at home (for otherwise from her point of view her wanting so would be *superfluous*) nor certain that he won't stay at home (for otherwise from her point of view her wanting so would be *useless*). At first sight, this may look like a flagrant contradiction. But a closer look will show us that both statements can be reconciled with each other. For there is a difference, sufficiently indicated by our wordings, in the moments of time and/or in the subjective points of view. Let us study the problem by means of another example. Suppose I want a certain letter to be posted, i.e., either to post it myself or to have it posted by someone else. In the latter case, I cannot be genuinely said to *want*, or *intend*, somebody to post the letter unless I take appropriate measures to make him do what I want him to do; for otherwise I would at best *wish*, or *hope*, that he post the letter. So if it is truly appropriate to speak of my *wanting*, and not merely wishing, that somebody else post my letter I have to *act* in some verbal or non-verbal way,[49] and this would be futile if I were subjectively certain that the person in question would in *any* case, or else in *no* case, do what I wish or like him to do. Similarly in the former case: If I were subjectively certain that I can't help doing or undergoing something, or else that I cannot possibly do it, it would again be futile to take those preparatory measures without which I could not be said to seriously intend to do a given action.[50] So if – and when, or while – I intend (someone) to do something, and intend so in a rational, non-spontaneous, or considered mode (which is the only mode of intending which is relevant to a logic of intention), I do not exclude that the event of which the intended action consists will take place, nor that it won't take place, or, in other words, then I think it possible that the 'action-event' will take place and likewise possible that the 'action-event' will not take place.[51] A corollary of this is that when and while I strictly intend (someone) to do a particular action I do not believe (am not certain, or convinced) that the corresponding 'action-event' will not take place. That this is even a logical truth can be seen from the last but one line, [10], of our derivation in section 11.5, above. But *not* believing that something will *not* take place is not the same thing as believing that it *will* take place (anyhow), which from an intuitive, action-theoretic point of view would be likewise incompatible with intending (someone) to do it but for strictly logical reasons has to be left out of consideration.[52] So *while* intending (someone) to do something I cannot be certain that it will *not* be done; but at a *later* moment of time it can of course be the case that I am certain, or that I downright see or have seen (i.e., that I *know*), that it has *not* been, or is *not* being, done – but then I cannot be said any longer to *intend* it to be done. Similarly, a person not identical to the believer-intender can be certain, or even know, that the action intended *will not* be done, e.g., because he knows that the action *cannot* be done for certain reasons so far unknown to the believer-intender.

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[48] In virtually the same way, a plausible looking objection against my detachment rule RW3 can be deprived of its sting; see Nortmann 1994: IV, p. 547, and VI, p. 550, and Hoche 1995c.

[49] See Hoche 1973: § 31.

[50] This may be best seen in cases in which someone (now) intends to do something in the (farther) future. For instance, the average modern man can hardly be said to truly intend (now) to go holiday (next week) unless in time he asks for leave, buys a ticket, and cancels appointments which are incompatible with his planned absence.

[51] Here, 'possible' means 'subjectively possible' as opposed, *inter alia*, to 'objectively (or counterfactually) possible' and 'absolutely possible'; see Hoche 1990: ch. 9, esp. 9.1–2.

[52] See sect. 11.5, above.

## 12. A final attempt:
### The paradoxes which gave rise to doubting the deductive closedness and hence the feasibility of buletic logic can be shown to be merely apparent ones

**12.1.** In section 11, I confined myself to calling in question only the *virulence* of the paradoxes under discussion, notably of the simple buletic paradox: From '(Wi) φ' we can derive not only '(Wi) **.** ¬ φ → ψ' but also '¬ (Wi) ¬ φ' and '¬ (Bi) ¬ φ', and so the detachment of any arbitrary '(Wi) ψ', which would be intolerable, is precluded; and this is to say that the paradox at least *need not bother us*. But if we content ourselves with this solution, an unpleasant after-taste is likely to remain: The formal derivation seems to be all right, whereas, according to C-CT, the informal combination test does not seem to speak in favour of a semantical implication. Let me stress once more that this objection can be raised in the non-buletic cases as well. So we should take a fresh look at the latter ones, especially at the purely propositional case referred to in sections 11.1–2. In addition to the short classical derivation

{1}     [1]     φ                                                                P
{1}     [2]     ¬ φ → ψ                                                          [1]T

which is based on a variant of Duns Scotus' Law  let us also consider the related derivation

{1}     [1]     φ                                                                P
{1}     [2]     φ ∨ ψ                                                            [1]T

in which we make use of the so-called adjunctive weakening.

**12.2.** As I said in section 11.2, at first sight it may seem that if we assent to an interpreted sentence such as

     (20)    John will stay at home.

we need not in the same breath also assent to the correspondingly interpreted sentence

     (21)    If John won't stay at home he will be visiting Jane.

Similarly, we may be tempted to think that the same is true for the pair of sentences (20) and

     (32)    John will stay at home or he will be visiting Jane.

Furthermore, it may seem that if we assent to (20) it is not only the case that we *need not* assent to (32). Rather, it may look as if we can strengthen this statement and claim that on this condition we *cannot* assent to it; for in asserting (32) we imply, by way of what has been called a 'conversational implicature',[53] that we are neither confident of (20) nor of

     (22)    John will be visiting Jane.

Provided this is acceptable, the assertions of (20) and (32) are *incompatible* with each other: If we assert (20) we imply that we are certain, or strongly believe, that John will stay at home; but if we assert (32), we imply that we are *not* certain that John will stay at home (instead of visiting Jane). Since *asserting* a sentence may be taken to be the strongest and most usual way of *assenting to* it, it now seems to follow that, according to our criterion C-CT, (20) implies neither (21) nor (32) linguistically at large, let alone semantically.

**12.3.** However, I think that we just fell victims to a one-sided line of reasoning. This will become obvious as soon as we scrutinize, not asserting a sentence, but another well-known form of assenting to it. What I am thinking of are affirmative replies to yes-no-questions as they occur in every-day life

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[53] The locus classicus is Grice 1975; but see also Grice 1961: III., esp. pp. 93 f.

as well as in filling in a questionnaire. Suppose your attending cardiologist is asking you whether in your childhood you had suffered from diphtheria or scarlet fever. Of course you will answer this question in the affirmative if you remember, or otherwise know, that as a child you had suffered from diphtheria. So in spite of the fact that, on the basis of this piece of knowledge, you are prepared to assent to

(33)     I suffered from diphtheria.

you would of course not hesitate to assent, by way of answering your cardiologist's question, to

(34)     I suffered from diphtheria or (I suffered from) scarlet fever.

as well. So it becomes obvious that the 'conversational maxim' of not, in the absence of a really good reason, *asserting* something that is weaker than what you can assert does not in general prevent you from *assenting to* a weaker statement if you can also assent to a stronger one.

**12.4.**  Again, once you have assented to (34) you would hardly believe yourself in a position to refuse to assent to another sentence, although perhaps you might find it somewhat out of place, viz., the sentence

(35)     If I did not suffer from diphtheria I suffered from scarlet fever.

It is true that assenting to (35) seems somewhat strange after having assented, in the same breath, to (33).[54] But I think this is due to the linguistic fact that normally we assert an adjunction such as

(36)     John betrayed the secret, or Jane did.

only in case that two conditions are fulfilled: First, we know that no one else besides Jane and John was in a position to betray the secret, and thus are certain that the adjunction as a whole, i.e., that at least one of the adjunctive members, must be true; second, we have no idea whether Jane or rather John was the traitor, and thus do not know which one of the adjunctive members is true: the first one, the second one, or possibly both. Given that these two conditions are fulfilled, we would not hesitate to pass from (36) to

(37)     If John didn't betray the secret then Jane did.

If, however, the second condition is *not* fulfilled, as it was supposed to be the case in the diphtheria example, this passage looks certainly strange. None the less in section 12.3., above, we could convince ourselves that, although nobody would think of *asserting* (34) if he has already *asserted*, and is still maintaining,[55] (33), yet in other, 'non-assertive' ways one can and must *assent* to (34) after having *assented* to, and while abiding by, (33).

**12.5.**  To put this important point more systematically: If we use an ordinary language sentence of the adjunctive form '$\varphi$ and/or $\psi$' after having used already the corresponding sentence of the simple form '$\varphi$', from the point of view of *linguistic pragmatics* this is either an *attenuation* (*weakening*) or else a *retraction* of the latter. The purely *logical* properties of the adjunctive sentence are the same in both cases: It is true if and only if at least one of the adjunctive members is true. The difference in use is solely a pragmatical one: In the first (attenuative) case the user continues to believe himself to know *which* member is true, but in the second (retractive) case he only believes himself to know that *at least*

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[54] Note, however, that once in a while we do not hesitate to say, in a vein of humour, some such thing as 'If she is of royal blood I am the emperor of China.'. This seems to me to indicate that sometimes, if we strongly dissent from a sentence '$\varphi$' and hence assent to its negation '$\neg \varphi$', we are prepared to assent to the subjunction '$\varphi \rightarrow \psi$', in which '$\psi$' is arbitrarily chosen though, as a rule, strikingly false.

[55] If somebody, after having asserted (34), is going on to assert (35) he will invariably be taken to retract his former, stronger assertion.

*one* member is, or must be, true (e.g., that, after the exclusion of other possibilities, the truth of at least one member can be concluded from facts otherwise known). So this difference is solely a difference of (believed) knowledge on the side of the user, from which it follows as a corollary that it has to do with the actual use of the sentence and thus is not logical but pragmatic – just as the difference between *asserting* a sentence and *assenting to it by way of answering the corresponding question* is but a difference of use and hence not a logical but merely a pragmatic one. So the paradoxes of 'material implication' seem to originate in our engrained tendency to allow pragmatical considerations to penetrate into, and mingle with, purely logical ones.

**12.6.**  What we should learn from this, and especially from the examples discussed in sections 12.3–4, is that our combined imaginative and idiolectic competence can be easily overstrained and that we may often get into a situation in which we are simply unable to decide the question whether, having assented to a particular sentence, we have to assent to another particular sentence, too. In such cases, however, we can and should make use of the transitivity of the relation of semantical implication in the sense of our criterion C-CT.[56] So we can convince ourselves that if we assent, at least in the 'non-assertive' way, to (33) we must also assent to (34) and that therefore (33) implies (34) linguistically. Moreover, the relevant possibilization

>  (38)    It is possible that I suffered from diphtheria but that it is not the case that
>           I suffered from diphtheria or (that I suffered from) scarlet fever.

is certainly false, and so we have to admit that (33) implies (34) semantically. Similarly we can convince ourselves that (34) implies (35) semantically and that therefore, because of the transitivity of semantical implication, (33) implies (35) semantically. So both of our syntactical derivations mentioned in section 12.1 have been vindicated, and the appearance of their paradoxical character has been explained by our prevailing tendency to mix up purely logical considerations with pragmatical ones, and more specifically by tending to focus our attention on *assertion* rather than on *other forms of assenting* to a proposition, and thus by the damaging influence of one-sided examples on doing philosophy.[57]

**12.7.**  In an analogous manner we can vindicate some other classical derivations, viz., the derivation of a logical truth from any arbitrary sentence and the derivation of any arbitrary sentence from a logical falsehood. For since we have to assent to a logical truth *in any case* we have to assent to it, *a fortiori*, *in case we have already assented to any arbitrarily chosen sentence*; and this is true in spite of the fact that we would hardly take pains to *assert* a logical truth such as the tautology

>  (39)    It is raining or (it is) not (raining).

So according to C-CT any sentence whatsoever implies a logical truth such as (39) linguistically. Moreover, a possibilization such as, say,

>  (40)    It is possible that I suffered from diphtheria and [but] that it is not the case that
>           it is raining or (that it is) not (raining).

is certainly false, and so the linguistic implication of (39) in, say, (33) is a semantical one. Once we have achieved this result, the 'reverse' case of the semantical implication of any sentence whatsoever in a logical falsehood can be similarly handled by using the so-called law of transposition to which semantical implication can be shown to be subject.[58]

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[56] I proved the transitivity of this relation in Hoche 2003: 4.1.
[57] Cf. Wittgenstein 1953: § 593.
[58] I proved this logical property of semantical implication in Hoche 2003: 4.1. – A more straightforward way of handling what I just called the 'reverse' case, which seems to be immediately suggested by the first step of C-CT, is blocked by our condition that none of the isolated sentences 'φ' and 'χ' to be considered in a pertinent combination test must be self-contradictory; see sect. 2.3, fn. 9, above. (Probably this condition could be mitigated in a suitable manner; but this is a minor point which I need not discuss here.)

**12.8.** It remains to show that our findings can be carried over to the corresponding doxastic and buletic cases. I think I may safely confine myself to scrutinizing only the latter one. Suppose I assent to the proposition

      (41)     I intend to have Irish stew.

Then I cannot help assenting also to

      (42)     I intend to have Irish stew or fried chicken.;

for by refusing to assent to (42) I would run the risk of getting neither one of these dishes. Of course, provided I still prefer Irish stew, I would never *assert* (42) after having *asserted* (41); for then it would seem as if I wanted to retract or cancel my original choice, and (42) would loose its character of being but a weakening of (41), which retains its full 'assertive force'. Here, too, the possibilization

      (43)     It is possible that I intend to have Irish stew and [but] that it is not the case that
              I intend to have Irish stew or fried chicken.

is certainly false; so according to C-CT (41) implies (42) semantically. Furthermore, I can plausibly pass from (42) to

      (44)     I intend to have fried chicken if I don't have [unless I have] Irish stew.

– at least as long as I leave it open whether, by assenting to (42), I have already made up my mind to have Irish stew and thus stick to (41). In this case, too, the possibilization

      (45)     It is possible that I intend to have Irish stew or fried chicken and [but] that it is not the
              case that I intend to have fried chicken if I don't have [unless I have] Irish stew.

is obviously false; so (42) implies (44) semantically. Since, as we found out before, also (41) implies (42) semantically, in virtue of the transitivity of semantical implication (41) implies (44) semantically as well. But this is exactly what is mirrored in a buletic derivation of the sort discussed in section 7.1, above. Hence by now such a derivation ought to have lost its paradoxical appearance, which has its origin merely in the psychological fact that we are subject to a strong tendency to have a one-sided look at the 'assertive' form of assenting to a proposition, or, speaking more generally, to allow pragmatical considerations to intrude into purely logical ones.[59]

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