ON THE NON-NEUTRALITY OF DEONTIC LOGIC

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Deontic logic is — contrary to its appearance as a formally fairly simple sort of sentential operator logic having a straightforward possible worlds semantics analogous to many other offsprings of modal logic — no easy subject matter. Its deserved status as one of the most controversial branches of the so-called philosophical logic is due to three main reasons. Paradoxes used to thrive in it.[1] Some fifty years after its inception there still seems to be an unending disagreement about the validity and interpretation of its leading axioms and theorems resulting in numerous competing or incompatible systems.[2] And finally, during all this time its very existence has been threatened by serious problems concerning its philosophical foundations.[3] This paper is an attempt to solve, or at least to clarify, questions surrounding the second problem. Why are there so many different systems and interpretations of deontic logic? Our diagnosis and explanation for the many controversies is that — contrary to common dogma — deontic logic is in an important sense non-neutral.[4] Thus it is not, and cannot be, a neutral tool of metaethics as many

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[1] Past tense because it has become clear that the deontic paradoxes are typically formalisation problems that can be solved given a suitably rich formal language that has expressive resources for the personal and temporal relativity of oughts. Thus they provide an adequacy test for deontic systems. For a useful typology of the deontic paradoxes see e.g. Åqvist (1984), especially pp. 621–664.

[2] These disagreements should not be exaggerated, however. Many proposed systems have failed and some have passed in the adequacy test of note 1 so that there has been undeniable progress.

[3] Especially the truth-value problem. See note 29 for one of its simplest formulations.

[4] At least two other scholars have, independently and from different starting points, come to similar conclusion. See Sayre-McCord (1986) and Pigden (1989). The former through careful examination of the import of deontic theorems and the latter through his discussion of the autonomy of ethics (although he mistakenly takes the lack of neutrality as an argument against deontic logic, cf. note 18). My own non-neutrality doctrine stems from a general observation regarding the schematic structure of philosophical logics discussed in my Ph.D. thesis "Is Deontic Logic Possible?" Victoria University of Wellington 1989.
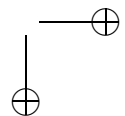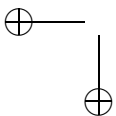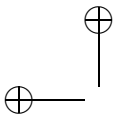
have assumed but is inextricably tied to ethics proper. Such non-neutrality
naturally has certain consequences for the other two questions too. At the
same time this paper is — in order to be consistent with its main lesson — a
defence of a certain type of mainstream deontic logic. We assume a certain
amount of familiarity with the semantic treatments of deontic logic in order
not to confuse the main issue with technical details.

1. *The neutrality requirement*

Mainstream systems of deontic logic have been constructed as *extensions*
of the well-known topic-neutral classical logic (i.e. propositional calculus
and/or lower predicate calculus). Their key idea is to enrich the language
of classical logic by introducing sentential O-operators to represent "ought"
and its conditioned variants. Semantically these operators are treated as re-
stricted or relative modalities. For this reason it is likely that some sort of im-
plicit neutrality principle drawn from the base logic, and admittedly method-
ologically reasonable in itself, may have guided many deontic logicians ever
since the beginning of modern deontic logic. Its most explicit formulation,
however, is due to van Fraassen.[5] In that context he argues against the so-
called axiological thesis which in its weakened form says that what ought
to be done is exactly what is better on the whole by some scale of values.
Anyone familiar with semantic treatments of deontic logic can see that the
promising ordering semantics is tantamount to the thesis van Fraassen at-
tacks. And so we need to examine his view carefully. It consists of two
arguments that could be formulated explicitly as follows:

[VF-1] 1. The existence of unresolvable ethical conflicts is a tenable eth-
ical position.
2. The axiological thesis rules out the existence of unresolvable
ethical conflicts.
3. Theses of metaethics do not rule out tenable ethical positions.
C. Therefore, the axiological thesis is not a thesis of metaethics.

[VF-2] 1. The axiological thesis is not a thesis of metaethics.
2. Deontic logic should not be founded upon any thesis which is
not a thesis of metaethics.

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[5] See van Fraassen (1973).
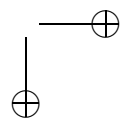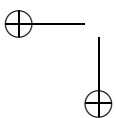
C. Therefore, deontic logic should not be founded upon the axio-logical thesis.[6]

His neutrality requirement regarding the philosophical foundations of deontic logic can now be stated: *deontic logic should not be founded upon any thesis that rules out tenable ethical positions*.[7] In similar vein, Hansson has argued that the so-called descriptive interpretation of deontic logic shows that deontic logic is a tool of metaethics and not a part of ethics proper.[8] It turns out, however, that the neutrality requirement cannot be fulfilled. As formulated by van Fraassen it is simply too strong. Both for deontic logic, and mutatis mutandis, for philosophical logics in general. None of those systems enjoys that sort of neutrality. And Hansson's view rests on a false premise as we shall also demonstrate.

2. *The schematic structure of systems of philosophical logic*

It is common knowledge that in philosophical logic one can distinguish between two approaches, namely, the axiomatic and semantic research traditions. The former takes a system of philosophical logic to be simply a set of well-formed formulae of some specified language, closed under certain rules of inference. Doing philosophical logic in this way means that: (i) we start with some basic philosophical notions; (ii) assign them their syntactic representations; (iii) formulate intuitively sound axioms governing these representations (which usually are operators); and (iv) finally specify the appropriate inference rules. After that we are ready to derive further theorems of our system and see whether they match our intuition.[9] It is well-known that the problem with this approach is its lack of explicit semantics. More

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[6] Let us accept the controversial first premise of [VF-1] for the argument's sake here. It is not clear how van Fraassen draws the distinction ethics vs. metaethics. However, he admits reasonably that a logic thus founded, e.g. his own dyadic system presented in van Fraassen (1972), might be an interesting special subject from a metaethical point of view.

[7] Perhaps we should note that the "should" occurring here and in the premises is that of a technical norm which have a truth-value and thus can appear in logical arguments even if non-cognitivism happened to be true. Van Fraassen has in mind something like this: in order to preserve the neutrality of deontic logic, it should not be founded upon any thesis that rules out tenable ethical positions.

[8] See Hansson (1969). Also Scotch and Jennings (1981) are clearly guided by a neutrality principle. They take the task of deontic logic to be to capture general moral reasoning.

[9] Hintikka (1999) is a formidable attack on "intuitionism" in general.

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precisely, the only trace of semantics in axiomatical systems can be found in the "mystical" relation that connects the wffs of the system and their natural language readings.[10] Hence philosophical logics need to be complemented with explicit semantics, to perform the following functions: (i) the formal interpretation of syntax (model-theory) and (ii) the intuitive explanation of the model-theory. Understood this way, systems of philosophical logic share the following schematic structure:

(1) The wffs (especially axioms and theorems) of the system.
(2) The natural language readings of the wffs.
(3) Formal semantics (i.e. the formal interpretation of the wffs).
(4) Intuitive semantics (i.e. the intuitive interpretation of formal semantics).

It is very important to realise that without (3) and (4) we do not have much more than an uninterpreted calculus because the natural language readings of the wffs, in the absence of explicit translation rules, are very much private property of the author. In other words, they represent his or her own intuitive understanding (private semantics) of how the formulae of some logic are connected to their natural language meanings. Whereas the point of philosophical logics is to explicate the logic of philosophically interesting or fundamental concepts. As usual, this task consists of technical and philosophical aspects that are intertwined. What we need is a formal language and semantics with sufficient expressive power that fulfils certain philosophical adequacy criteria. Presumably the system should be rich enough for the formalisation of: (i) the relevant concepts and the various conceptual relationships they stand in, (ii) the relevant inferences and arguments involving those concepts that go beyond the expressive resources of classical logic. Furthermore, it should be paradox-free etc.

After these structural preliminaries our non-neutrality thesis can be advanced in its general form. *Systems of philosophical logic are not, and cannot be, philosophically neutral because their semantics builds in substantial assumptions that rule out philosophically tenable theories.*[11]

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[10] In another context Merrill Provence Hintikka has used the happy phrase "miraculous translation" for this feature of the axiomatic approach to logic. See Hintikka (1983), p. 175. As every logic student knows the translation of natural language statements into the formalism of LPC is the hardest part of the introductory course.

[11] In our view this is true of a wide variety of such logics for reasons given in this paper. Whether it holds of them *all* is an open question.

3. *Cases of non-deontic non-neutrality*

Quantified modal logic (QML) provides an excellent example of such non-neutrality. It has turned out to be extremely difficult to combine quantification theory and propositional modal logic in order to reach a philosophically satisfactory system of QML. Every student of QML knows that there exists a bewildering number of competing systems. Consider e.g. the eleven different systems surveyed by Garson in the Handbook of Philosophical Logic.[12] Each one has its philosophical motivation and intended purpose of application. This no doubt bewildering multiplicity is due to the simple fact that in the construction of those systems there are many independent decisions that not only can be made but literally *have to be made* one way or another regarding terms, predicates, quantifiers and the domain of quantification, and the set of relevant possible worlds. Many, if not all, of these choices amount to substantial philosophical or metaphysical assumptions and so the corresponding systems of QML are not philosophically or metaphysically neutral, i.e. each of them rules out tenable theories of modality.

There is e.g. the standard semantics of universal (logical) necessity and possibility by Kanger with its constant frame that includes the set of all possible worlds.[13] And for weaker modalities there is the non-standard semantics with its variable frames allowing various interpretations, discovered independently and a bit later by several logicians.[14] To name further instructive instances of non-neutrality, it is no news that Kripke's well-known version of the non-standard semantics builds in the substantial assumption that terms are rigid designators. As demonstrated by Garson this formal choice colours Kripke's entire philosophical outlook.[15] The systems of QML can also be classified with respect to whether they accept the validity of certain central philosophically motivated formulae. Consider e.g. the so-called Barcan Formula, i.e. the schema $(\forall x)N\alpha \supset N(\forall x)\alpha$, which depends on the domain of quantification. The fact that some scholars e.g. Cresswell have presented philosophical arguments for (BF) also shows that systems which include it

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[12] See Garson (1984) for an excellent survey of QML.

[13] Kanger (1957). Surprisingly not mentioned by Garson.

[14] At least by Kanger, Hintikka, Guillaume, Montague, Kripke and Beth. For the standard vs. non-standard semantics see e.g. Hintikka (1982) and the references thereof.

[15] Garson (1987).

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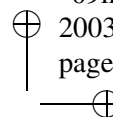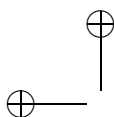
cannot be philosophically neutral.[16] Ultimately the many independent semantic choices can only be justified by philosophical argumentation. This is the general mechanism that builds in philosophically substantial assumptions to systems of philosophical logic.

Temporal logic offers another instructive analogy. Presumably with our extensive theories of modern physics we know a great deal about time and — unlike St. Augustine — have also been able to explicate our many theories of time in the form of logical systems. But, considering the many possible properties of time (e.g. discreteness and linearity), it still might be that there is no temporal logic compatible with all tenable theories of time. Certainly the temporal logic of a static Newtonian universe differs considerably from the temporal logic of a relativistic Einsteinian universe. The neutrality requirement seems completely out of place here.

Similar counterexamples can be produced from other branches of philosophical logic without difficulty. Strictly speaking, we might wonder whether our cherished classical logic that rules out true contradictions is also non-neutral because, in addition to its extensions considered above, it has *alternatives* that don't.[17] Comparison with intuitionistic and free logics also brings out the non-neutral aspects of classical logic. As does its commitment to the law of excluded middle under normal semantics (cf. Hintikka's game-theoretical semantics where nothing guarantees the existence of winning strategies for either player in the corresponding semantical game). These examples of non-deontic non-neutrality have by now provided us a vantage point from which to reconsider the logical status and interpretation of deontic logic.

4. *The status of deontic logic*

The examination of van Fraassen's neutrality requirement in a wider context has led us to the following choice. Either we accept it and have to conclude that along with deontic logic we have to abandon a great many other systems of philosophical logic. Or else we have to adjust our interpretation of deontic logic and of its status as a logic a little. Taking into account the amazing variety of modern logic and the vast number of fruitful analyses it has offered in different areas of philosophy we find that the latter course is the way to go. In our view, deontic logic is logic exactly in the same sense

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[16] Cresswell (1991).

[17] The way out is to deny the tenability of those paraconsistent theories and systems but we need not enter that discussion here.
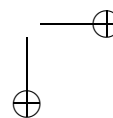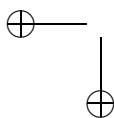
as the other philosophical operator logics. We have the same sort of proof-theory, semantic methods and logical results for systems of deontic logic as for the various other branches of modal logic.[18] The primacy of semantics is once again crucial. Deontic logic is *logic given the semantics* of those ought-sentences and obligation concepts it deals with. Again a comparison is instructive. Consider the fundamental axiom/theorem of propositional modal logic Np ⊃ p or its so-called dual p ⊃ Mp. These formulae represent basic conceptual or analytic truths about the corresponding notions of necessity and possibility and therefore they can be regarded as logical truths, axioms/theorems or truths of modal logic if you like. They are valid but only given the correct semantics.[19] From that semantics follows various other theorems depending what sort of necessity/possibility is in question. It is not too different even in the simplest case, i.e. classical propositional logic. The familiar wff p ⊃ (p ∨ q) is also valid but only given what the logical words ⊃ and ∨ mean. In this case the meaning of the truth-functional connectives can be given simply by their truth-tables and we can argue that the completeness theorem for PL shows that the connectives mean exactly what the truth-tables say. The difference between deontic logic and alethic modal logic is that there seems to be much more disagreement about the semantics of obligation concepts than about the meanings of concepts of necessity and possibility. And thus there is conceptual space for many different and competing systems of deontic logic. Such pluralism need not lead to any serious type of relativism because there are tests for the philosophical adequacy of deontic logics (e.g. the so-called paradoxes of deontic logic which can be viewed best as formalisation problems). And what's important, it can be argued that there really are many different obligation concepts with their different logics.[20] The systems of deontic logic are thus a *by-product* of truth-conditional semantics for natural language. In the deontic fragment

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[18] A good reference to the technical side of deontic logic is Åqvist (1984). Pigden's argument against deontic logic on the basis of its non-neutrality is mistaken because other logics also contain non-neutral features.

[19] Here we have a case of modal Moorean knowledge: the validity of these formulae must be a criterion for the correctness of the semantics.

[20] The fact that practically all possible combinations of a monadic deontic operator and a conditional have been proposed for the expression of conditional obligations suggests that there really are several different concepts of conditional obligations obeying e.g. different detachment principles. Especially, as one can prove that the Feldman-type conditional obligation is a primitive concept (i.e. cannot be expressed in terms of a monadic O and a non-deontic conditional). For that indefinability argument see Innala (1994). And among unconditioned obligations there are defeasible prima facie obligations and absolute obligations in addition to non-moral ones.

of that language various obligation concepts occur quite frequently and with
various semantics.[21] Once the meanings are fixed we get a number of deontic
systems. They can also be understood as formalisations of particular cogni-
tive theories of moral (or other kind of) obligation. Such theories postulate
that there are true statements of obligation and thus they warrant logical sys-
tems where the formal counterparts of those statements occur in the scope of
truth-functional connectives. The truth-condition for the obligation concept
in question may involve elements like a specified value ordering that are not
metaethically neutral (i.e. that element could be an integral part of a par-
ticular theory in normative ethics). For example, if it is the intrinsic value
ordering of worlds, then we have Feldman's world-utilitarianism which is a
theory that avoids some of the problems inherent in the formalisation of act
utilitarianism. Now that particular ordering has certain formal properties that
have consequences for the deontic logic it generates. It is absolute (i.e. we
have the same ordering for every world) and universal (i.e. all worlds are in-
cluded in it). And these properties influence the validity of iterated formulae
as shown by Lewis.[22] Let us look deeper into that kind of semantics.

5. *A prototype deontic semantics*

If we simplify matters just a little, the development of mainstream deontic
logic consists of progression toward more and more articulated formalisms
and their greater expressive power necessitated by a single paradox.[23] A
state-of-the-art deontic system should have expressive resources for the cru-
cial personal and temporal relativity of ought. Here we present the basic
ideas of one such semantics which we regard as fundamentally sound for

[21] Suppose our goal is to achieve a general semantic analysis of natural language. From
that viewpoint non-cognitivism is the not so credible thesis that the occurrence of genuine
oughts in its sentences renders a considerable fragment of it outside the scope of truth-
functional semantics.

[22] See Lewis (1974) for many interesting results.

[23] The duly famous Chisholm-paradox presented originally in Chisholm (1963). Interest-
ingly, this one can be regarded as a *non-neutral paradox* because it is based on assumptions
of logical consistency and non-redundancy of a set of natural language ought-sentences. The
paradox arises because many formalisations cannot preserve those logical properties. It has
been instrumental for the development of deontic logic as it contains an implicit proof to the
effect that deontic and factual detachment are incompatible.

moral obligation. Mainstream dyadic deontic logic includes two closely related approaches. For DFL-type semantics the conditional obligation statement O(q/p) is true at a world w just in case the set of best p-worlds is a *non-empty* subset of the q-worlds.[24] The other semantics by Hansson, Hilpinen and Åqvist says that O(q/p) is true at w just in case all best p-worlds are q-worlds.[25] The degree of a world's deontic ideality is given by an ordering of worlds. Different contexts may presuppose different orderings.

What ordering should we have for moral obligation? Feldman has argued that it is the intrinsic value ordering. His interesting DBWC-system amounts to an agent- and time-relativised version of DFL-semantics. The truth-conditions for absolute and conditional moral obligation sentences are as follows:

(1) Os,t,p is true at w0 iff $\exists w1(As,t,w1,w0 \wedge p$ is true at w1 $\wedge \sim\exists w2$ $(As,t,w2,w0 \wedge \sim p$ is true at w2 $\wedge IV(w2) \geq IV(w1)))$.

(2) $Os,t,(q/p)$ is true at w0 iff $\exists w1(As,t,w1,w0 \wedge (p \wedge q)$ is true at w1 $\wedge$ $\sim\exists w2(As,t,w2,w0 \wedge (p \wedge \sim q)$ is true at w2 $\wedge IV(w2) \geq IV(w1)))$.[26]

What is the status of these (and similar) truth-conditions? They seem to reduce the obligation statements of the object-language into something else in the metalanguage, namely, a complex compound of accessibility clauses and axiological conditions etc. formulated in terms of a first-order language enriched with extra-logical elements. However, the point is that such semantic analysis reveals what (moral) ought-sentences have always meant so there is no genuine reduction (call it non-eliminativist reduction if you like) involved. As a result we get a deontic system of the aforesaid type capable of providing simple solutions to the paradoxes and with many other fruitful applications. This case is an excellent illustration of how the semantics builds in theoretical assumptions.

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[24] DFL is after Danielsson (1968), van Fraassen (1972) and Lewis (1973). The so-called Limit Assumption familiar from the semantics of counterfactuals is crucial in this context. See also Åqvist (1984).

[25] Again, see Åqvist (1984) for details and references. Åqvist (1986) presents a deductive equivalence theorem for the two approaches.

[26] His theory is presented in Feldman (1986). In the truth-conditions As,t,w1,w0 is to be read as "w1 is accessible for subject s as of a time t from w0" and IV(w) is the total intrinsic value of w. The unintuitive obligatoriness of unalterables can be ruled out by adding the clauses $\sim Us,t,p$ (to be read: "p is not unalterable for s as of t") and $\sim Us,t,(p \wedge q)$ to (1) and (2) respectively, they were left out for purposes of clarity. For a smooth solution of the deontic paradoxes, see Feldman (1989) and (1990).

6. *The importance of relativisation*

Dilemma-free systems such as the one above have received a lot of criticism in recent years. Here we need not enter the discussion on the tenability of moral theories that allow unresolvable dilemmas. Instead we can illustrate the expressive power of our favoured sort of deontic system by rejecting an argument for treating deontic logic as an extension of paraconsistent logic. Routley and Plumwood have argued that it is a mistake to treat deontic notions as modal i.e. as if strict or provable equivalents are intersubstitutable within them salva veritate (rule S1) and consequently all mainstream deontic logics are inadequate.[27] As believers in moral dilemmas their adherence to the principle (AG) $Op \land Oq \supset O(p \land q)$ makes them to take a dramatic step: they are willing to accept full force dilemmas of the form (D2) $O(p \land \sim p)$. Usually the supporters of moral dilemmas have been content with dilemmas of the form (D1) $Op \land O\sim p$ as they have accepted at least the weakest version of the principle "Ought Implies Can" formulated in terms of logical possibility. We have as valid $\sim M(p \land \sim p)$ and so by contraposition $\sim O(p \land \sim p)$. Hence Routley and Plumwood must reject the Kantian slogan. With these background assumptions in mind their argument can now be summarised as follows:

[RP]   1. There are moral dilemmas of the forms (D1) and (D2) which do not collapse moral distinctions.
        2. If there are moral dilemmas of the forms (D1) and (D2) which do not collapse moral distinctions, then an adequate deontic logic must be able to represent them without collapsing moral distinctions.
        3. Modal deontic logic cannot represent these moral dilemmas without collapsing moral distinctions.
        C. Therefore, modal deontic logic is not adequate.

It is quite instructive to see the basis for their third premise. If we add an instance of (D2) to a deontic system containing the usual rule S1, then we get $O(p \land \sim p \land q)$ because $(p \land \sim p)$ is strictly equivalent with $(p \land \sim p \land q)$. Now (CAG) $O(p \land q) \supset (Op \land Oq)$, the converse of (AG), gives Oq. This means that in dilemmatic situations everything becomes obligatory. Due to (AG) dilemmas of the form (D1) have the same consequence. If the deontic system contains the consistency principle (CON) $Op \supset \sim O\sim p$, then such dilemmas lead to straightforward contradictions. Routley and Plumwood conclude that both (CON) and (S1) have to be rejected. Moreover, as these

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[27] Routley and Plumwood (1984). In that paper they attack a very simple standard deontic system apparently unaware of such essentially richer frameworks as van Eck (1982).

two are essential to modal systems, the resulting deontic logic has to be paraconsistent.

Of course, we reject P1 of [RP] and our strongest argument against paraconsistent deontic logic is the general argument against paraconsistency. There are no true contradictions. If there were this would only show that they weren't contradictions after all. The semantic models of Routley and Plumwood incorporate worlds where contradictions are alive and well, and so we have a non-moral argument against their approach. In fact, [RP] can be used to illustrate the importance of having a deontic system containing person- and time-indexes for obligation statements. We can show that Routley and Plumwood have among other things neglected the effect of relativisation. Suppose, *per impossibile*, that there were moral dilemmas of the form $Os,t,(p \wedge \sim p)$.[28] From this follows Os,t,q but this does not mean that *all* moral distinctions have collapsed. It only means that *for s at t* anything is obligatory or there is no way to act morally (and would not this be an excellent characterisation of such dilemmatic situations!). After this admittedly miserable moment or period things may return back to normal in the sense that moral distinctions for the subject s re-emerge. Therefore, we reject also P3 of [RP]. There is no need for relevant deontic logic in such cases: modal deontic systems are adequate.

7. *Against the descriptive interpretation*

Most non-cognitivistic deontic logicians have reacted to the foundational problem[29] by resorting to a distinction. The idea is that deontic sentences are characteristically ambiguous, i.e. they can be interpreted in two radically

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[28] Perhaps we should explain here why we reject moral dilemmas for absolute personal moral obligation. Suppose we have an alleged dilemma with two or more incompatible courses of action. Consider e.g. Sartre's example where a young man is torn between two difficult choices: to join the fight for free France (p) or to stay with his sick mother (q). In our view such cases are not dilemmas of the forms D1 or D2. Instead we have two possibilities: (i) In the final analysis one of the choices is better according to the intrinsic value ordering and so it alone is obligatory. No dilemma here. Or (ii) There is no way to tell which one is better (perhaps even because of incommensurable values) in which case they are to be regarded as equal choices. Now we have a disjunctive obligation $O(p \vee q)$ which can be obeyed by doing p or q. To do anything else would be wrong. Again there is no dilemma.

[29] This truth-value problem could be expressed simply as the problem of how there can be deontics logics containing wffs in which formulae of the form Op occur in the scope of truth-functional connectives if the corresponding genuine ought-sentences lack truth-values as non-cognitivism says. Surprisingly , even von Wright, the founder of modern deontic logic, has always been a firm non-cognitivist. To his credit, he has worried about this problem more than any other.

different ways. Consider a typical deontic sentence of the form "It ought
to be the case that...". On the first *prescriptive* reading it is interpreted as a
norm or an obligation to behave in a certain way. On the second *descriptive*
reading it is interpreted as a statement that there exists a norm or an obli-
gation to behave in that way. These two readings are said to be radically
different because the existence of norms or obligations is an uncontrover-
sial social fact whereas norms or obligations *themselves* are thought to be
incapable of assuming truth-values. A fortiori, deontic logic is now inter-
preted, not as a logic of norms or obligations themselves, but as a logic of
norm-propositions, i.e. descriptively interpreted ought-sentences.

However, all versions of this widely held view seem to have the same fun-
damental flaw, namely, that the descriptive interpretation does not generate
logical relations (e.g. deontic theorems) that are in any sense peculiar to
deontic sentences. More exactly, the danger is that deontic logic thus con-
ceived collapses to classical propositional calculus in the sense that there are
no other valid formulae in addition to the deontic substitution instances of
PC-tautologies.

To see how serious the situation really is, let us first consider the familiar
deontic wff (CAG) $O(p \wedge q) \supset (Op \wedge Oq)$. As we know, it is a theorem of
the standard deontic systems and reflects the semantical idea that the obliga-
tion operator can be treated as a restricted universal quantifier over possible
worlds. However, it is not a logical validity on the norm-proposition inter-
pretation: from the existence of its antecedent $O(p \wedge q)$ in some normative
system (or alternatively from the fact that $O(p \wedge q)$ has been explicitly pro-
mulgated by some norm-authority) there is no *logical* bridge to the existence
of Op and Oq separately (or to the promulgations of Op and Oq separately)
in that same normative system. As von Wright has realised we need further
rationality assumptions to guarantee the validity of such formulae.[30] Indeed,
on the strictest interpretation (exemplified by the following literal readings
of Op: "the norm-authority has explicitly promulgated p obligatory" or "it
is written in the legal code that p is obligatory") the O-operator becomes
a hyperintensional operator for which even the substitution rule for logical
equivalents (i.e. $\vdash \alpha \equiv \beta \rightarrow \vdash O\alpha \equiv O\beta$) does not hold. It seems con-
ceivable that for some α and β the normative code explicitly contains $O\alpha$
and $\sim O\beta$, even though α and β are logically equivalent (especially when β
stands for a complicated sentence). The explanation being that law-givers
and other norm-authorities are not logically omniscient (or that an earlier
contradictory norm has simply been forgotten and now they are both part of
that unfortunate normative system). Thus on that interpretation contradic-
tory codes seem possible! Notice that similar problems occur if one tries to

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[30] See e.g. von Wright (1985).

interpret O by analogy from epistemic logic as "according to what is promulgated by a norm-authority, it is the case that".[31]

Moreover, there is another strong, more philosophical, reason for not basing deontic logic upon actual normative systems. Simply because the relevance of such systems to what really ought to be or ought to be done is minimal.[32] Therefore, as the descriptive interpretation is incapable of generating a credible deontic system for moral obligation, Hansson is wrong saying that the descriptive interpretation shows deontic logic to be a tool of metaethics.[33] The neutrality he is looking for cannot be achieved that way.

8. *Aspects of deontic non-neutrality*

Let us summarise in what senses deontic logic is non-neutral:

(1) *Deontic logics as logics of particular theories of obligation.* We argued that deontic logics are generated by the semantics of obligation concepts. The meanings of statements of moral obligation are an integral part of theories of normative ethics. These theories differ with respect to many assumptions they make and at least some of these have an effect on the class of valid formulae. Detachment principles come first to mind. Different deontic logics validate different principles for conditioned obligations. Axiological assumptions are another good example. Some value orderings are world-relative and some are non-contingent. Furthermore, there are theories according to which we should act only upon universalizable principles.[34] Formally, this boils down to the validity of the formula (UP) $Os1,t1,q/p \supset \forall x \forall t(Ox,t,q/p)$ which is not valid for theories where our obligations are determined also by the particular features of ethical situations (e.g. Feldman's utilitarianism for which even $Os1,t1,q/p \supset Os2,t1,q/p$ is invalid). Similarly the logics of absolute and prima facie obligation are different (e.g. the latter are defeasible obligations). And there are theories and logics that allow

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[31] The many limitations of norm-authority theories deserve a paper of their own.

[32] It is quite possible that there actually exist normative systems that are all-wrong in this respect (e.g. when the system represents the will of a dictator).

[33] Perhaps it should be pointed out that in this section we do not criticise Hansson's formal semantics. In our view it is part of the mainstream approach. Whereas the descriptive interpretation is linked with non-cognitivism and the idea that norm-authorities and normative systems are the source of our obligations.

[34] E.g. Kant's Categorical Imperative: Act only on that maxim which you can at the same time will to become a universal law.

or do not allow moral dilemmas. We seem to have good reason to con-
clude that there is no deontic logic that is neutral with respect to all tenable
theories of morality.[35] And thus deontic logic cannot be a neutral tool of
metaethics. Here we notice that the distinction ethics vs. metaethics is not
so sharp as imagined by many philosophers.[36] It cannot be drawn as the dis-
tinction between the different theories of normative ethics and deontic logic
understood as their common logic (i.e. language that is neutral with respect
to all competing ethical theories). Deontic logic appears both ethically and
metaethically non-neutral. Of special importance is the question what is the
logic of the true theory of moral obligation, if such there be. Here deontic
logic has a very valuable function in explicating the semantic structures and
hidden assumptions of different moralities.

(2) *Mainstream systems are premised on cognitivism.* The truth-value
problem exemplifies another aspect of the non-neutrality of deontic logic
not to be found in other philosophical operator logics.[37] The mainstream se-
mantic analyses of deontic logic are all premised on cognitivism (or perhaps
non-non-cognitivism would be a better term to use), understood here simply
as the assumption that genuine ought-sentences, e.g. (GOS) "John ought not
to pour boiling water over Katie", have truth-values. In other words, their
formal counterparts can and do occur in the scope of normally interpreted
truth-functional connectives. We regard (GOS) as a model example of an
ought-sentence which has a truth-conditional semantics of a kind that gener-
ates a deontic logic. Now it may very well be the case that non-cognitivism
rules out deontic logic.[38] But let us suppose for the argument's sake that
there could be systems of deontic logic premised on non-cognitivism. These
might differ considerably from mainstream deontic logics. Then we would

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[35] Sayre-McCord (1986) ends up with a very similar conclusion.

[36] It is not easy to find clear elucidations of this distinction. Non-cognitivism is presum-
ably a metaethical doctrine. And those who preach what we should do are obviously doing
normative ethics. But how about e.g. the meaning analysis for moral obligation?

[37] Logics of imperatives and questions are possible exceptions. However, our view is that
they too belong to the realm of logic because they are in fact paraphrased performatives with
automatic truthfulness as stressed by such semanticists as Lewis and Cresswell. The idea is
that the imperative "Close the window!" has the same meaning, intension and truth-value as
the performative "I order you to open the window". See e.g. Lewis (1970).

[38] In our view non-cognitivism does indeed rule out deontic logic as logic of obligation
(i.e. in the final analysis non-cognitivist interpretations of deontic logic do not work) but that
is a difficult and complex topic for separate forthcoming papers. That issue is certainly the
main source for the many controversies surrounding deontic logic.

have both kinds of deontic logics but certainly no system that is neutral regarding the cognitivism vs. non-cognitivism controversy, i.e. no system founded upon both or neither of them. Thus that controversy has no bearing on our non-neutrality thesis.

(3) *Non-neutrality by modal assumptions.* Deontic logic inherits this sort of non-neutrality by being an offspring of modal logic. Obviously the language of deontic logic needs quantificational resources and in the framework of possible worlds we seem to get instances of non-neutrality that are similar to those of QML. This is easily understood if we think of quantified deontic logic as a re-interpreted actual or possible QML-system of the non-standard variety. To be exact, that analogy is not quite right because the O-operator has both necessity- and possibility-like properties.[39] Nevertheless, our point still holds. And there is also a direct route for such modal assumptions. One could argue that we need to introduce necessity and possibility operators to the object language of deontic logic in order to explicate and evaluate certain philosophically interesting theses.

All these three senses (and sources) of non-neutrality are intertwined. Theories of (moral) obligation include general modal assumptions in addition to those that can be characterised as ethical assumptions and they share the truth-value assumption. In Quinean terms, deontic logic is not free of ontological commitments. To be more precise, we can distinguish two kinds of deontic non-neutrality. We have *strong non-neutrality* when the different semantics do not validate the same theorems and inferences. Above we mentioned some examples of it. And *weak non-neutrality* means that the same theorems and inferences are validated but the semantic models nevertheless reflect different ethical theories.

Given that deontic logic is bound to be non-neutral one way or another, what is the best we can get? The answer is that the ordering semantics offers us the best chance of flexibility and generality, i.e. relative neutrality.

Although the ordering semantics and mainstream truth-conditions for deontic logic amount to the axiological thesis rejected by van Fraassen it clearly has a methodologically very desirable feature, namely, its generality and flexibility. At the level of formal semantics this means that a wide range of deontic logics can be generated by the same basic formal structure. Thus we

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[39] Like necessity operators the obligation operator can be regarded as an universal quantifier over an appropriate set of worlds, but just as possibilities may disappear as time marches on, obligations can cease to exist. Something which can never happen to statements of diachronic (or any other) necessity. Formally, the formulae $M_t p_{t''} \supset M_{t'} p_{t''}$ and $O_t p_{t''} \supset O_{t'} p_{t''}$, where $t < t' < t''$, are invalid but $N_t p_{t''} \supset N_{t'} p_{t''}$ is of course valid. Another interesting question is whether ought-contexts are extensional unlike contexts with other modalities. That thesis has recently been advanced by Goble (1996).

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have a common framework for the logico-philosophical study of a considerable class of ethical theories. Moreover, as we have every reason to believe that "ought" is an indexical word that gets at least part of its meaning only relative to an ordering of worlds, it follows that this is the most general approach to deontic logic. Other obvious and already familiar indexes of the obligation operator are times and agents. Usually these are supplied by the context. Consider again the sentence (GOS) "John ought not to pour boiling water over Katie". Interpreted as a statement of moral obligation determined by the objective and non-contingent intrinsic value ordering it comes out true in most contexts. It says, roughly, that in the intrinsically best worlds accessible for John, he does not pour boiling water over Katie. However, we could imagine a not too far-fetched context where John and Katie are textile engineers testing some kind of protective clothing for housewives. Now another ordering is presupposed, namely, that which determines their professional obligations and the truth-value changes accordingly. Following Lewis we can say that the formal semantic structure of suitably indexed dyadic systems is relatively independent of the intuitive interpretation of the ordering.[40] In fact, it seems that ordering semantics can without any difficulties also represent those ideas that deontic logicians subscribing to non-cognitivism have found extremely difficult to develop further.[41]

An important but rather disappointing consequence of strong non-neutrality must be noted. *General proofs* of theses containing deontic notions become problematic. Suppose you find that some such thesis holds for some deontic systems and fails in others.[42] What can you conclude? Probably no more than that the thesis holds for those systems whose semantics presupposes it and it does not hold for systems whose semantics does not presuppose it. Again there is room for disagreement and philosophical arguments.

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[40] See Lewis (1973) p. 96 for details. There is, however, a fairly strong philosophical argument to the effect that we need to specify the intuitive interpretation of the deontic ordering. What entitles us to assume the existence of a value ordering and value metrics? This question is, mutatis mutandis, the question that Niiniluoto makes against similarity approaches to truth-likeness.

[41] E.g. the idea that deontically ideal worlds represent the will of a norm-authority can be handled by the ordering semantics in a straightforward manner.

[42] Recent explications of Hume's Guillotine seem to have this status. As philosophical theses they cannot be proved by deontic logic but might be reasonable criterions for it. Of course, deontic could still prove some conditional general principles: if this and this is assumed, this thesis holds.

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