

Deontic Logic from a Bird's Eye Perspective

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Plan of the presentation

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Elements of the history of deontic logic

The word “deontic” is derived from the Greek expression δέοντος (desirable, binding, proper)
Jeremy Bentham used the word ‘deontology’ for “the science of morality”.

First formal system of deontic logic

Ernst Mally 1926 – an axiomatic system of the “fundamental principles the logic of ought” - “Deontik”

$$\text{Ma1 } ((p \rightarrow Oq) \ \& \ (q \rightarrow r)) \rightarrow (p \rightarrow Or)$$

$$\text{Ma2 } ((p \rightarrow Oq) \ \& \ (p \rightarrow Or)) \rightarrow (p \rightarrow O(q \ \& \ r))$$

$$\text{Ma3 } (p \rightarrow Oq) \leftrightarrow O(p \rightarrow q)$$

$$\text{Ma4 } (\exists \mathbf{u})O\mathbf{u}$$

$$\text{Ma5 } \neg(\mathbf{u} \rightarrow O\neg\mathbf{u})$$

here formulated in nowadays standard symbolic conventions

O - obligatory, ought to be the case

P- permissible, permitted

F - forbidden

u - an unconditionally obligatory state

Karl Menger proved the theorem of Mally’s system

$$Op \leftrightarrow p$$

von Wright's Old System (1951) paper *Deontic logic*

von Wright's observation – principles for deontic modalities are analogous to alethic modalities except

$\Box p \rightarrow p$ but not $O p \rightarrow p$
 $p \rightarrow \Diamond p$ but not $p \rightarrow P p$

NB: deontic operators in OS are applied to **generic acts** A, B, C,... (ways of acting like A: *smoking*, B: *stealing*):
PA – Smoking is permitted, FB – Stealing is forbidden, P is the basic deontic modifier ($OA \leftrightarrow \neg P\neg A$)

Three fundamental principles of OS:

The Principle of Deontic Distribution:

Wp1 $P(A \vee B) \leftrightarrow (PA \vee PB)$

The Principle of Permission:

Any given way of acting is either itself permitted or its negation is permitted.

Wp2 $PA \vee P\neg A$

The Principle of Deontic Contingency:

Wp3 It is not the case that tautologous actions are obligatory i.e. $\neg O(A \vee \neg A)$,
and it is not the case that contradictory actions are forbidden i.e. $\neg F(A \wedge \neg A)$.

OS started the boom of deontic logic (especially in the sixtieth of the 20. century).

Alternative delineations of the concept of deontic logic

various names under which logical theories from this area have been presented:

deontic logic, the logic of norms, the logic of normative systems, the logic of commands, imperative logic, the logic of commitment and obligation, the logic of ought, the logic of ethics,...

Stanford Encyclopedia of Philosophy:

Deontic logic is that branch of symbolic logic that has been the most concerned with the contribution that the following notions make to what follows from what:

permissible (permitted)	must
impermissible (forbidden , prohibited)	supererogatory (beyond the call of duty)
obligatory (duty, required)	indifferent / significant
omissible (non-obligatory)	the least one can do
optional	better than / best / good / bad
ought	claim / liberty / power / immunity

Handbook of Deontic Logic and Normative Systems (2013), D. Gabbay et al. eds

covers not only “modal logics” but also logical theories that concern logical properties of commands/directives/imperatives.

two conceptions of deontic logic : **narrow** (DL is a branch or a bundle of branches of modal logic)
broad (DL deals with logical problems connected with prescriptive discourse)

Controversial philosophical issues related to deontic logic

Jørgensen's dilemma (1937):

The dilemma can be put forward in the following three theses:

1. Imperative (or generally prescriptive) sentences are neither true nor false - they do not have truth values.
2. The relation of logical entailment is based on the concept of truth (as truth-preservation), hence arguments whose conclusion (and/or premises) is neither true nor false cannot be logically correct.
3. Some arguments whose conclusion (and/or premises) is imperative/prescriptive are patently logically correct.

e.g.	<i>Love your neighbor as yourself!</i>	<i>You ought to love your neighbor as yourself</i>
	<u><i>Love yourself!</i></u>	<u><i>You ought to love as yourself</i></u>
(Therefore:)	<i>Love your neighbor!</i>	<i>You ought to love your neighbor</i>

All three theses looks plausible but they cannot hold together - at least one of them must be rejected.

But which one?

Rejecting of 1. – rare (exceptions J. Kalinowski, R. Walter, D. Lewis (?))

Rejecting of 2. – broad conception of deontic logic

Rejecting of 3. – narrow conception of deontic logic (only **deontic statements** can be studied by DL)

Hume's thesis/guillotine (1739)

In every system of morality, which I have hitherto met with I have always remark'd, that the author proceeds for some time in the ordinary way of reasoning, and establishes the being of a God, or makes observations concerning human affairs; when of a sudden I am surpriz'd to find, that instead of the usual copulations of propositions, 'is: and 'is not; I meet with no proposition that is not connected with an 'ought', or an 'ought not'. This change is imperceptible; but is, however, of the last consequence. For as this 'ought', or 'ought not, expresses some new relation or affirmation, 'tis necessary that it should be observ'd and explain'd; and at the same time that a reason should be given, for what seems altogether inconceivable, how this new relation can be a deduction from others, which are entirely different from it. (A Treatise of Human Nature)

Hume's Is-Ought problem: Can ought be derived from is? (Can moral judgments be based on facts?)

K. Popper's strengthening (1948):

Perhaps the simplest and most important point about ethics is purely logical. I mean the impossibility to derive nontautological ethical rules - imperatives; principles of policy; aims; or however we may describe them - from statements of facts. Only if this fundamental logical position is realized can we begin to formulate the real problems of moral philosophy, and to appreciate their difficulty. (What Can Logic Do for Philosophy?)

Hume's Thesis: No prescriptive (ethical) conclusion can be logically deduced from a set of premises that contains only descriptive premises.

Majority of involved philosophers accept Hume's Thesis (admit the fact- value gap), but still a controversial topic.

Hare's Thesis (modified from R.M. Hare: *The Language of Morals*)

No descriptive conclusion can be logically deduced from a set of premises (descriptive *cum* prescriptive) which cannot be logically deduced from the descriptive premises alone.

But what about:

Jones should pay his debt to Smith's brother
Smith has a brother

John, go to the pub on Elm Street!
There is a pub on Elm Street.

Are these (logically) correct deductions?

Standard deontic logic and related paradoxes

SDL evolved from von Wright's Old System, but in SDL the primitive operator is O and p, q, r,... are **propositional** variables.

$$\text{SA1} \quad \neg(\text{Op} \wedge \text{O}\neg p)$$

$$\text{SA2} \quad \text{O}(p \wedge q) \leftrightarrow (\text{Op} \wedge \text{O}q)$$

$$\text{SA3} \quad \text{O}(p \vee \neg p)$$

rules of inference – substitution rules and *modus ponens*

In von Wright's OS SA3 is invalid - Principle of Deontic Contingency $\neg\text{O}(A \vee \neg A)$.

In OS there are no mixed formulas – counterparts of wff $p \rightarrow \text{O}q$ from SDL.

There are many axiomatizations, extensions and variations of SDL. One common problem of a large number of scholars developing the “standard” system – **deontic schizophrenia** – sentences like Op or Fp are at the same time interpreted as action guiding (prescriptive) and as true or false.

Ross' paradox (1941)

Standard deontic logic $O p \rightarrow O(p \vee q)$ is a theorem

RP	<u>$O p$</u>	<u>$!p$</u>
	$O(p \vee q)$	$!(p \vee q)$

Though logicians typically admit that some inferences of the form, e.g., the following notorious instance ascribed to Ross

RP	<u><i>You should mail the letter.</i></u>	<u><i>Mail the letter!</i></u>
	<i>You should mail the letter or burn it.</i>	<i>Mail the letter or burn it!</i>

Many logicians claim that RP is an unproblematic inference scheme, many logicians claim that it is intolerable in a reasonable system of deontic logic.

Good Samaritan Paradox

Plausible-sounding idea: If something necessarily implies something forbidden, then it is itself forbidden.

Arthur Prior (1958) - controversial inference:

PMS Necessarily, if a Samaritan helps a pilgrim who is robbed and wounded, then the pilgrim is robbed and wounded.

The pilgrim ought not to be robbed and wounded!

A Samaritan ought not to help a pilgrim who is robbed and wounded!

This judgment takes the following form:

PMSF $\Box(p \rightarrow q)$
 $O\neg q$
 $O\neg p$

This form is valid in the extension of SDL proposed by Alan Anderson (1967)

Axioms of S2 or S4 plus

$Op =_{df} \Box(\neg p \rightarrow S)$ S – a sanction arises

$\Diamond\neg S$

Chisholm paradox (1963)

Chisholm presents the three regulations and one statement:

CHP 1) Man XY should go to help his neighbors.

2) It should be the case that if XY really goes to them help them, then he should let them know that he is going to help them.

3) If XY is not going to help them, he should not let them know, that he is going to help them.

4) XY is not going to help his neighbors.

Although all of these statements seem quite plausible - we can easily imagine a situation where the regulations were taken as justified and the statement was true, their confluence leads according to SDL to a contradiction (XY is committed to contradictory actions)

Chisholm demonstrates this through their following formalization:

CHP 1) $O p$
2) $O(p \rightarrow q)$
3) $\neg p \rightarrow O\neg q$
4) $\neg p$

But in SDL from 1) and 2) is derivable Oq and from 3) and 4) is derivable $O\neg q$ – paradox of **contrary-to-duty obligations**.

Lewisian prescriptive on deontic language games (1979)

David Lewis proposes a language game involving three players: *the Master*, *the Slave*, *the Kibitzer* (commentator, referee)

the moves of the Master consist in issuing commands and permissions (to the Slave)

the moves of the Slave consist in making what the Master requires the case

the moves of the Kibitzer consist in her/his descriptions of the normative situation (statements about what the Slave ought to resp. may do)

the moves of the Master shape *the Sphere of Permissibility* (SP)

the moves of the Slave consist in actions that are to assure that the actual world stays within the Sphere of Permissibility

at the beginning of the game, *the Sphere of Permissibility* amounts to *the Sphere of Accessibility*, i.e. the Slave is allowed to do what he wants

the language of the Master consists exclusively of prescriptions (commands and permissions)

either categorical, e.g. $!p$ or conditional, e.g. $!p/q$ (resp. ip or ip/q)

the language of the Kibitzer consists in describing the deontic situations (and possibly in factual statements)
(the Slave keeps silent)

It is also important to realize that while the interdefinability of O and P—the central operators of the Kibitzer's language—is (under some assumptions) uncontroversial, it is futile to search for a similar interdefinability between the operators “!” and “j”.

The lesson from appreciating the import of the Lewisian language game for deontic logic:

Forget about one universal deontic logic!

A taxonomy of deontic logic (broadly understood)

I proposed a classification that divides the theories that generally (may) fall within the scope of deontic logic into three (resp. six) different categories:

Logic of the Master's language

Logic of the Kibitzer's language

Logic for the Slave (logic of shaping of the Sphere of Permissibility)

Close the door and the window!

Close the window!

The Slave is obliged [ought] to wash the dishes or to walk the dog

The Slave is not obliged to walk the dog

The slave is obliged [ought] to wash the dishes

If you are in the house stay in the kitchen or in the living room!

Never eat in the living room!

The Slave may eat only in the kitchen

Dynamic versions of the logical theories (allow for updating of commands/permissions/information)

Logic of the Master's language

Logic of the Kibitzer's language

Logic for the Slave (logic of shaping of the Sphere of Permissibility)

t₁ M: *Never drink my wine or leave the house!*
t₂ M: *You may leave the house when the dog is in the garden*
Never leave the house unless the dog is in the garden and never drink my wine!

Information at t₁ *The Slave is obliged to wash the dishes and to walk the dog*
Information at t₂ *The Slave is not (anymore) obliged to wash the dishes if he cleans the bathroom*
Conclusion K: *The Slave is obliged to wash the dishes or to clean the bathroom*

t₁ M: *Always wear your uniform!*
t₂ M: *Do not leave the farm!*
t₃ M: *You may leave the farm when you need to go shopping.*
t₄ M: *You needn't wear your uniform when you are not on the farm!*
K: *The Slave is allowed not to wear his uniform only when he is shopping.*

From the perspective of a Lewisian language games (some of) the problems/paradoxes of deontic logic appear in a new (and sometimes illuminating) light.

For example, Ross paradox is clearly intolerable in the logic of Master's language while tolerable in the logic of Kibitzer's language

RP Op _____ !p _____
O(p ∨ q) FINE !!(p ∨ q) BAD (disjunctive imperatives are choice opening)

That's all.

The core of the presentation can be found in:

Svoboda, Vladimír: A Lewisian Taxonomy for Deontic Logic, *Synthese* 195, 2018/7

Česká kniha o deontické logice:

Svoboda, V.: *Logika pro Pány, Otroky a Kibice - filosofický průvodce světem deontické logiky*, Praha, Filosofia, 2014.