

Formalizing the Right to Know: Epistemic Rights as Normative Positions

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Abstract

We argue for the fruitfulness of studying epistemic rights in the context of the theory of normative positions. We do so through an illustration considering the right to know. We show six possible formalizations of this right, and study their logical behaviors.

Keywords: Deontic and epistemic logics, dynamic logic, reasoning about knowledge.

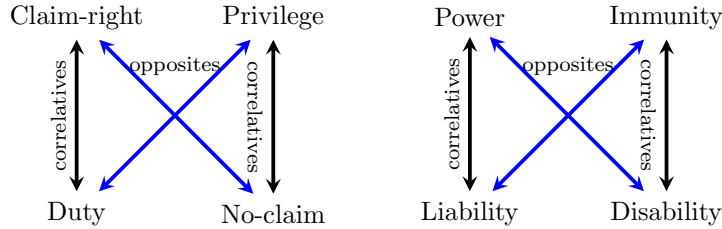
What does it mean to say that expectant parents have a right to know whether their child will be healthy? Or that a patient has a right to know her test results? What do we refer to when saying that citizens have a right to know if their government does something illegal, or that a detained person has a right to know his rights?

These questions bear on epistemic rights. The category of epistemic rights has been studied in philosophy, but mainly regarding the right to believe in the context of epistemic justification [7]. In legal theory, epistemic rights have only been studied in contrast with normative positions [21,1]. It has even been argued that Hohfeldian categories (see below) cannot be used to analyze epistemic rights [22]. The systematic study of epistemic rights *as* a group of legal, Hohfeldian rights started recently [19,20]. The work presented here contributes to this literature, taking epistemic rights, in the narrow sense, to mean those rights that concern the epistemic state of the right-holder. In a broader sense, combinations of deontic and epistemic notions have been studied in cases where the rights bear on the duty-bearer's epistemic state, such as the right to privacy or the right to be forgotten [2,3,6]. An important benchmark here is the so-called Aqvist's paradox [16,10], which we will come back to later.

Here we focus on the right to know, and show that it can be fruitfully studied in the theory of normative positions. The right to know has many versions depending on what kind of knowledge the right concerns, and it's ranging over the different normative positions (examples below). There are other epistemic rights, of course: the freedom of thought, consumers' right not

to be misled by advertisements, or the right to truth, some of which we address in the companion paper [12].

Normative Positions The theory of normative positions stems from the work of the American legal theorist, Hohfeld [9], who proposed a distinction between four types of atomic right-positions (Figure , top line) and their correlative duty positions (Figure , bottom line) [11]:



Each right corresponds to a correlative duty, and for the present paper, this correlation can be simply seen as equivalence. The normative positions are inherently relational. An agent’s claim-right concerns the counter-party’s action, and this constitutes the latter’s duty (in the narrow sense). An agent’s privilege (or freedom) to do something means that the counter-party doesn’t have a claim-right that he doesn’t do that thing. A power and the related positions in the second square are higher-order. Having a power means having the potential to change the counter-party’s normative positions. Immunity refers to the counter-party’s lack of power.

When we refer to someone’s right in law, it can be any of the above-mentioned atomic positions (or a combination thereof [11]). In Hungary, for instance, citizens have a right to know the MPs’ declarations of property, also that of the local representatives. But these two rights are different normative positions. MPs have a statutory duty to publish their declarations, while local representatives have to publish them only if a citizen requests it. The first right to know is a claim-right, while in the case of local representatives, it is a power. The right to know also comes under different guises in healthcare. If a medical test is carried out, the patient has a right to know the result: the doctor has a duty to let him know. A right to *not* know is usually also listed among the patient’s rights: the patient has the ability to change the doctor’s duty to let him know about his results, which is a power.

Language and Semantics Here we only sketch the formal model, the precise definitions will be provided in the presentation and the companion paper. We use a propositional language extended with four modalities. $\mathbf{K}_a\phi$ is the standard knowledge modality from epistemic logic, to be read as “agent a knows that ϕ ”. $\mathbf{O}_{a \rightarrow b}(\phi/\psi)$ is a directed conditional obligation, to be read as “given ψ , a has a duty towards b that ϕ ”. For a study of the importance of such directed obligations in the theory of normative positions, see [11]. $\mathbf{E}_a\phi$ is an agency operator to be read as “agent a sees to it that ϕ ”, and $\Box\phi$ is a (legal) necessity operator to be read as “it is legally settled that ϕ ”.

This language is interpreted in Kripke models extended with a neighborhood function f_a for the agency operator. We assume that the epistemic accessibility relations are equivalence relations, that the conditional obligation operators are interpreted using the standard preferential semantics [8], and that the legal necessity operator is interpreted also on an equivalence relation. The neighborhood function is only assumed to satisfy the following: for all w and $X \in f_a(w)$, $w \in X$. Later on, we also show the consequences of assuming that the neighborhood functions are monotone, i.e. if $X \in f_a(w)$ and $X \subseteq Y$ then $Y \in f_a(w)$. Effectivity functions in coalition logic have, for instance, that property [15].

We also investigate formalization of the right to know using dynamic modalities [18,17] instead of static agency operators. This is motivated by the fact that the actions we study here are mostly epistemic actions, for instance *informing* a patient about her test result. The dynamic operators are of the form $[\mathcal{A}_d, a]$, where \mathcal{A}_d is an action model for agent d , and a is an epistemic action in it. These modalities are then interpreted with the standard product update operation [18].

The right to know as a normative position Our running example is one of expectant parents who have a right to know whether their fetus will be a healthy child or whether it has a genetic disorder, illness, etc, which we refer to using the propositional constant *ill*. As a first pass, this scenario can be captured by stating that the parents have an unconditional claim-right against the doctor to know whether the fetus is ill. We can formalize this in either a static or dynamic way.

$$\mathbf{O}_{d \rightarrow p} E_d (\mathbf{K}_p(\textit{ill}) \vee \mathbf{K}_p(\neg \textit{ill})) \quad (1)$$

$$\mathbf{O}_{d \rightarrow p} \bigwedge_{a \in \mathcal{A}_d} [\mathcal{A}_d, a] (\mathbf{K}_p(\textit{ill}) \vee \mathbf{K}_p(\neg \textit{ill})) \quad (1d)$$

Instead of an unconditional claim-right, one could instead capture the right to know as a pair of conditional obligations. There are two options here, the first one using the primitive conditional obligations operator available in our language both in static and dynamic forms.

$$\mathbf{O}_{d \rightarrow p} (E_d \mathbf{K}_p(\textit{ill}) / \textit{ill}) \wedge \mathbf{O}_{d \rightarrow p} (E_d \mathbf{K}_p(\neg \textit{ill}) / \neg \textit{ill}) \quad (2)$$

$$\mathbf{O}_{d \rightarrow p} \left(\bigwedge_{a \in \mathcal{A}_d} [\mathcal{A}_d, a] \mathbf{K}_p(\textit{ill}) / \textit{ill} \right) \wedge \mathbf{O}_{d \rightarrow p} \left(\bigwedge_{a \in \mathcal{A}_d} [\mathcal{A}_d, a] \mathbf{K}_p(\neg \textit{ill}) / \neg \textit{ill} \right) \quad (2d)$$

An alternative formalization uses the classical “wide scope” approach [5]:

$$\mathbf{O}_{d \rightarrow p} (\textit{ill} \rightarrow E_d \mathbf{K}_p(\textit{ill})) \wedge \mathbf{O}_{d \rightarrow p} (\neg \textit{ill} \rightarrow E_d \mathbf{K}_p(\neg \textit{ill})) \quad (3)$$

$$\mathbf{O}_{d \rightarrow p} (\textit{ill} \rightarrow \bigwedge_{a \in \mathcal{A}_d} [\mathcal{A}_d, a] \mathbf{K}_p(\textit{ill})) \wedge \mathbf{O}_{d \rightarrow p} (\neg \textit{ill} \rightarrow \bigwedge_{a \in \mathcal{A}_d} [\mathcal{A}_d, a] \mathbf{K}_p(\neg \textit{ill})) \quad (3d)$$

Observations and Results We first look at the logical relationships between these different formalizations. Since there is no set relationships between the

static agency operators and the epistemic actions, the static and the dynamic versions are mutually independent. On the static side, (2) entails (3), while (1) and (2) are logically independent, and so are (1) and (3). If, however, the neighborhood functions are monotone, then we get stronger relationships: (3) entails (1), but not the other way around, and so (2) entails (1). The picture is different on the dynamic side: (1d) and (3d) become logically equivalent, and both are logically strictly weaker than (i.e. are implied by) (2d).

Next, we consider Aqvist's paradox. It arises from the basic observation that in standard deontic logic, if someone has an obligation to know that something bad is the case and knowledge is veridical, then it ought to be that something bad is the case [16]. Our formalizations put an agency or a dynamic operator between the deontic and the epistemic operators, but this operator also validates T , so the question arises whether they also fall prey to the paradox. Formulating an epistemic claim-right as a right to know *whether* generally allows the paradox to be avoided [10]. This is also true for (1), also in monotone frames, and for its dynamic version (1d). For the right to know formulated using conditional obligations, the situation is more subtle. Regardless of whether they express epistemic rights, conditional obligations validate $O_{d \rightarrow p}(ill/ill)$ [23]. So we get trivially that $\mathbf{O}_{d \rightarrow p}(E_d \mathbf{K}_p(ill)/ill)$ entails $\mathbf{O}_{d \rightarrow p}(E_d \mathbf{K}_p(ill) \wedge ill/ill)$. This has little to do with our formalization of this epistemic right. It arises from this specific semantics of conditional obligations. (2), however, does *not* imply an unconditional obligation that the fetus is ill. Like the first, it turns out that the wide-scope formulations also avoid the paradox, although it is also well-known that they handle contrary-to-duty obligations poorly [13]. In the full paper, we also study whether the paradox re-appears when we consider propositions that are (legally) settled.

We finally observe that dynamic analysis allows the relation between duties bearing on epistemic actions, and possible epistemic conditions for these duties, to be studied in more detail. As usual in dynamic epistemic logic (DEL), our three dynamic versions can be translated into formulas without a dynamic operator using reduction axioms. These formulas make explicit references to the pre-conditions of the actions. This allows the study of the effect of imposing stronger, possibly epistemic preconditions, for instance, that an action of informing parents that their fetus is ill is only executable when the doctor knows that the relevant test results are positive. This would allow an interesting connection to be made with the theory of knowledge-based obligations, for instance [14].

Conclusion We have sketched how epistemic rights can be fruitfully analyzed by combining tools from the theory of normative positions and epistemic logic. We did this through an illustration considering the right to know. We have shown that even for this comparatively simple right, one can devise at least six possible formalizations, with different logical properties. We take this to be a first step towards a more comprehensive analysis. The relationship between what the holder of the correlative duty ought to do in the claim-right to know and the state of knowledge of the right-holder should be better understood, for

instance.¹ Here we represented this as the duty-bearer, i.e. the doctor, having a duty to see to it that the parents know whether the fetus is ill. A different content of this claim-right would be that the doctor has a duty to make the information about the health of the fetus available to the parents. Since this idea comes close to a claim-right to knowability, it might be analyzable using tools from the logic of arbitrary announcements [4].

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