# Completeness of Common sense Term-Sequnce-Deontic-Alethic Logic

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The languages of propositional modal logics has been shown to be highly useful in developing dynamic modal logics that deal with various speech acts. It is also clear, however, that we need more expressive language if we wish to state, for example, a general principle to the effect that if you promise to keep a person safe, you will be committed to keep her safe. Its natural formalization may be something like the following:

$$\forall x \forall y [\mathrm{Promise}(x, y, \mathrm{Safe}(y))] O(x, y, x)\mathrm{Safe}(y),$$

where $[\mathrm{Promise}(x, y, \varphi)]$ means whenever an act of promising to see to it that $\varphi$ is performed by $x$ addressing $y$, $x$ will be committed to see to it that $\varphi$ in the resulting situation and $O(x, y, z)\varphi$ means that it is obligatory for $x$ with respect to $y$ by the name of $z$ to see to it that $\varphi$. This talk presents a static base logic $maths fCTS DAL$ (Common sense Term-Sequnce-Deontic-Alethic Logic) that we hope can be extended in to a dynamic language in which we can state things like the one above. We define a logic, $maths fCTS DAL$, in which we can state, fo example,

$$\forall x \forall y (\mathrm{Parent}(x, y) \wedge \mathrm{Young}(y)) \rightarrow O(x, y, x)\mathrm{Safe}(y),$$

which means that parents are committed to see to it that their young children are safe, and prove its completeness. This presentation is based on joint work with Katsuhiko Sano and Takahiro Sawasaki.