

**Meeting:** 1007, Santa Barbara, California, SS 10A, Special Session on Complexity of Computation and Algorithms

1007-03-62            **Jaakko Hintikka\*** ([hintikka@bu.edu](mailto:hintikka@bu.edu)), Department of Philosophy, Boston University, 745 Commonwealth Avenue, Boston, MA 02215. *Complexity of information extraction in logical semantics*. Preliminary report.

In logical semantics, information can be defined in terms of the number of possibilities a proposition excludes. In complexity theory, a namesake notion is defined in terms of the length of the computation it takes to prove a proposition. By analyzing the semantical notion of information, the two concepts can be related. In a logical language, a proposition does not always reveal directly all the alternatives it excludes. Some of the prima facie possibilities are merely apparent and can only be disregarded as a result of logical inferences. If they are taken into account, we have measures of surface information; if not, of depth information. The latter is invariant with respect to logical equivalence, but not the former. Both are nevertheless factual information in the sense of influencing an agent's decisions. Since merely apparent possibilities do not seem to be capable of being weighted in an interesting way, it is reasonable to use as a measure of surface information the difficulty of the process needed to eliminate merely apparent possibilities. This can be taken to motivate the notion of information of complexity theorists. (Received January 26, 2005)