Periphrastic *use*: the expression of goals

English provides several means for talking about instruments:

(1)   a. I generally brush my teeth with <u>a toothbrush</u>.
        b. Chloe used <u>a wet blanket</u> to put out the fire.
        c. <u>This spray</u> kills mosquitoes instantly.

Although the instrument is a familiar member of the constellation of proposed thematic roles, we lack a clear sense of what instrumenthood involves. Instruments have been analyzed in terms of undefined primitives such as CONTROL and CONTROLLER (Nilsen 1973) and BY (Jackendoff 1990), or as causal intermediaries (e.g. Talmy 1976). In this paper I explore the semantic properties of one instrument-introducing element, periphrastic *use*, arguing that *use* is best defined in terms of the goals of an agent.

Although a causal-intermediary analysis of instruments is often intuitively plausible, it will not cover the full range of events that *use* may describe. For example, a semantic decomposition within the framework of Dowty (1976) seems to capture the meaning of (1b):

(2)   [[Chloe ACT wet blanket] CAUSE [BECOME [fire extinguished]]]

(2) can be paraphrased as Chloe acted on the wet blanket, which caused the fire to become extinguished. Such an approach to instrumenthood does not, however, capture the causal relations in a sentence like (3a):

(3)   a. Chloe used a ladder to change the lightbulb.
        b. [[Chloe ACT ladder] CAUSE [BECOME [lightbulb changed]]]

Under a counterfactual analysis of causation (c.f. Lewis 1973), (3b) is inappropriate: it is not the case that if Chloe had not acted on the ladder, the lightbulb would not have been changed. Rather, Chloe chose to include the ladder in the event because it was helpful to her in some way.

I adopt the alternative approach that *use* provides information about the goals of an agent with respect to an event. *Use* indicates the presence of a subevent in which the agent acts on the object of *use* (the instrument). The outcome of the event is more consistent with the agent's goals when the agent acts on the instrument than when the agent does not. This meaning is formalized in (4). v is the type of events, $O(e)(w) \equiv e$ occurs in w, $e' \subset_w e \equiv e'$ is a subevent of e in w, f(w) is a circumstantial modal base and g(w) an agent-oriented teleological ordering source (c.f. Kratzer 1991 for a definition of partial order).

(4) $\| \text{use} \|^c = \lambda x \in D_e. \, \lambda P_{<v<st>>}. \, \lambda e \in D_v. \, \lambda w \in D_s.$
        $P(e)(w) \wedge \exists e': e' \subset e \wedge Ag(e') = Ag(e) \wedge Pat(e', x) \wedge$
          $\forall w': (w' \in f(w) \wedge O(e)(w') \wedge O(e')(w') \wedge e' \subset_{w'} e) \rightarrow$
            $(\exists w'': (w'' \in f(w) \wedge e' \subset_{w''} e \wedge O(e)(w'') \wedge \neg O(e')(w'') \wedge w' <_{g(w)} w''))$

Applying this denotation to (3a), e is a changing event and there is a subevent e′ where the agent of e = the agent of e′ and the ladder is the patient of e′. For all worlds w′ in which the changing event and subevent occur, there exists some world w″ in which the changing event but not the subevent occur and w′ is more consistent with the agent's goals than w″.

With its use of a teleological ordering source, my analysis establishes a relationship between periphrastic *use* and structurally similar purpose clauses (c.f. anankastic conditionals):

(5)   You must take the A train <u>(in order) to go to Harlem</u>.

Nissenbaum (2005) analyzes the *(in order) to* adjunct as indicating that in all worlds compatible with the goals relevant to some event, PRO goes to Harlem in those worlds. This proposal supports the analysis of *use*-instruments as indicating some fulfillment of an agent's goals.