

Scalarity and state-changes in Mandarin, Hindi, Tamil, and Thai

Jean-Pierre Koenig and Liancheng Chief
University at Buffalo,
The State University of New York

It has been widely held since Vendler (1957), Carter (1976), Dowty (1979), Bach (1986), and others that verb meanings fall into a small number of categories (states, processes, and externally induced (causal) or autonomous changes of states). Individual verb meanings, in that view, flesh out the structural backbone of verb meaning by specifying the nature of the initial or final state or processes, or their participants (Levin and Rappaport, 1998). In this paper, we show that verb meanings can also differ within and across languages in terms of *how much of a bounded change of state is entailed to have occurred*.

Our starting observation is that in several South and East Asian languages, the equivalent of the English causative accomplishment sentences in (1)-(2) do not necessarily entail that the change was complete, although they do entail that the proto-Patient underwent some change. We dub this fact the *Incompleteness Effect* (hereafter, IE). (For reasons of space, we cite only Mandarin data.) Some scholars have proposed that the source of the IE lies in the meaning of these languages' aspect markers (cf. Smith 1991 for Mandarin *-le*), or in the non-boundedness of some of their DPs (Soh and Kuo 2001), or the denotation of the relevant verb stems (Singh 1998, for Hindi, Talmy 2000, for Mandarin, Paramasivam 1977, for Tamil, and Koenig and Muansuwan 2000, for Thai).

We first provide evidence that the source of the IE is indeed the meaning of the relevant verb stems in those languages. The fact that the IE can arise even when the DP is bounded (includes a numeral), as shown by (2) and other attested examples, shows that the source of the IE is not, e.g., the underspecified boundedness in Mandarin of definite/demonstrative DPs, contra Soh and Kuo.

- (1) Xu Mei he Sun Mazi ba Lao Lo sha le mei sha-si^{Google attested}
Xu Mei and Sun Mazi BA Lao Lo kill PERF not kill-die
'Xu Mei and Sun Mazi killed Lao Lo but didn't make him die.'
- (2) wo (...) chi le liang chuan dakao, dan mei chi-wan^{Google attested}
I (...) eat PERF two CL kabob, but not eat-finish
'I ate two kabobs, but didn't finish eating. (lit.)'

The fact that not all induced change of state stems lead to the IE, even when the aspect marking and the direct object's boundedness are kept constant (see the infelicity of (3)) shows that the verb stem's identity is the determining factor for the IE.

- (3) #Ta mai le yi ben shu, keshi mei mai-dao
he buy PEF one CL book, but not buy-arrive
'He bought a book, but didnt get it. (lit.)'

Second, sentences like (3) show that not all induced change of state stems lead to the IE, contra the (implicit) assumption of previous scholars. (4)-(5) list some induced change-of stems that lead to the IE and (6) some that do not in Mandarin. (Similar generalizations hold in Thai; and, with some variations on stems that correspond to the stems in (4), similar generalizations hold in Hindi and Tamil.)

- (4) *Non-incremental complex scalar changes*: *xiū* ‘to repair’, *quàn* ‘to persuade’, *shā* ‘to kill’, ...
- (5) *Incremental complex scalar changes*: *chī* ‘to eat’ *hōng* ‘to dry (clothes)’, *xǐ* ‘to wash’, *zhǔ* ‘to cook’, *dú* ‘read’, *xiě* ‘write’, ...
- (6) *Simple scalar changes*: *kāi (diàn)* ‘open a store’, *huàn* ‘exchange’, *mai* ‘buy’ ...

Third, to model the semantic difference between induced changes of state that license and do not license the IE, we extend the work of Hay et al. (1999), Beavers (2005), and others on the relation between scalarity and changes of state, and Krifka (1998), Filip and Rothstein (2006), and others on telicity. We argue that the crucial difference between stems in (4)-(5) versus (6) is that the result state for the former can be construed as a point on a complex scale (a scale that involves more than two degrees, Beavers (2005)) whereas the result state for the latter can only be construed as a point on a binary scale (owning vs. not owning for (3)). That is, whereas the result state for the verb *sha* ‘kill’ can be construed as one point in a series of degrees on a scale of the patient’s health (Schank (1973)), the result state of *mai* ‘buy’ involves only two degrees. Only complex induced scalar changes of state lead to the IE. Note that the IE arises not only with stems that denote incremental induced state changes, those for which a homomorphism can be defined between the event’s part-whole structure and the ordered set of degrees on the result state’s underlying scale (a scale of how completely written the text is for *xie* ‘write’, or a scale of how clean the washed entity is for *xi* ‘wash’); it also arises, somewhat more surprisingly, when the verb stem denotes non-incremental induced changes of state. Those stems’ result states *can be analyzed* as a point on a scale (a scale of health, repair, persuasion, ...), but one cannot define a homomorphism between the event’s part-whole structure and the set of degrees on the result scale.

Our definitions of simple and complex scalar induced state-changes forms the basis of our hypothesis about the difference in meaning between corresponding stems in Mandarin-like languages (hereafter, incomplete languages) and English-like languages (hereafter, complete languages). Sentences in incomplete languages whose verbs denote complex scalar induced state changes, have specified quantity arguments, and are in the perfective aspect entail that the scalar result state holds at topic time (Klein 1991) with a degree $d_0 < d \leq d_N$, whereas in complete languages the same sentences license a stronger entailment, namely that the scalar result state holds at topic time with the degree $d_0 < d = N$ (where d_0 is the degree of the property held by the proto-Patient at the event’s onset). We demonstrate that this hypothesis (i) accounts for the contrast in meaning between Mandarin *xiū* and English ‘to repair’, and similarly between *quàn* and ‘to persuade’, or *shā* and ‘to kill’; (ii) explains that only complex scalar changes of state lead to the IE in incomplete languages. Since the property’s degree must have changed in incomplete languages too ($d_0 < d$), and simple scales involves only two degrees (d_0 and N), even in incomplete languages $d = N$ when the scale is simple.

In conclusion, our paper solves a long-standing problem in cross-linguistic semantics: Why sentences like (1) and (2) are felicitous in many South- and East-

Asian languages, but not in other languages. It properly circumscribes the difference to stems denoting complex scalar induced changes of state and provides a general account of the subtle difference in meaning of near-translation pairs in complete and incomplete languages. Finally, it suggests that lexical meaning differences do not simply arise out of differences between atomic event categories or atomic predicates in lexical decompositions (i.e., state and process predicates). Some differences can pertain to more molecular aspects of lexical meaning, here, what portion of a bounded change of state is entailed to have been induced.