Paraphrases and the idiosyncrasies of complex predications

Martin Schäfer, Heinrich Heine Universität Düsseldorf

Paraphrases have played a prominent role in distinguishing between classes of modifiers. Thus, Oshima (2009) takes the pairs in (1) and (2) to be "roughly synonymous", and uses this property to distinguish the *wise-* and the *lucky*-adjective class (Wilkinson, 1976) from other adjective classes.

(1)   a.   **Wisely**, John **left** early.
         b.   John was **wise to leave** early.

(2)   a.   **Luckily**, John passed the exam.
         b.   John was **lucky to pass** the exam.

Both *wisely* and *luckily* are used as as sentence adverbials, though not of the same class: *wisely* as a subject-oriented adverbial and *luckily* as a speech-act adverbial of the evaluative subclass (cf. Maienborn and Schäfer 2011, Schäfer 2013). That is, in (2-b) John is judged as being wise based on the fact that he left early. And in (2-b), the speaker considers the fact that John passed the exam as based on luck. The parallel paraphrases in (1) and (2) are not showing that the two adverbials belong to the same class, but that the ADJ-*to*-INFINITIVAL construction also varies in its interpretation. In fact, this construction can also be used to paraphrase sentences with *quickly* and *slowly*, which never occur as sentence adverbials. Here the parallel is not with the sentence initial occurrence of these adverbs; rather, one finds roughly synonymous usages within the lower adverb positions, cf. the pair drawn from the British National Corpus in (3).

(3)   a.   'No, no,' Sven Hjerson was **quick to reply**. [A0D 27]
         b.   'Yes, that's right,' she **replied quickly**. [EA5 1798]

Thus, the ADJ-*to*-INFINITIVAL paraphrase for *wisely/luckily* corresponds to a high adverb reading, the one for *slowly/quickly* to a low adverb reading (Ernst, 2002).

Based on a distributional semantics analysis of the two patterns for the four adjective/adverb pairs, this paper aims to come to a better understanding of the semantic contribution of the constituents on the one hand and their embedding syntactic contexts on the other hand in the resulting complex predications.

The distributional analysis proceeded as follows:

1. I first collected cooccurrence counts for each adjective-adverb pair, restricting the adjectives to those matching the *to*-INFINITIVAL pattern. For the adverbs, three positions were distinguished: sentence initial, preverbal, and postverbal. To extract the cooccurrence counts, I used the ukWaC. This is 2 billion word web-crawled corpus, where the web-crawl has been restricted to `.uk` domains Ferraresi et al. (2008). The ukWaC corpus is part of speech tagged.
2. The cooccurrence counts were collected for the top 10,000 content words. The words had to cooccur with the target expression in the same sentence (this and the next step follow Reddy et al. 2011).
3. The resulting raw counts were set to ratio of probability of context word given the target word to overall probability of context word .
4. To compare the similarity of the transformed cooccurrence counts, I used the cosine similarity between the resulting vectors.

The resulting similarities are shown in Table 1. A cosine similarity of 1 indicates perfect similarity (the vectors are identical). The closer the value gets to 1, the more similar 2 vectors are.

A cosine of 0, corresponding to a 90 degree angle, indicates unrelated scores. Since *luckily* is too rare postverbally, its similarity could not be meaningfully calculated.

ADJ-*to*-INF	sentence-initial ADV	preverbal ADV	postverbal ADV
quick	0.09	0.37	0.36
slow	0.07	0.20	0.19
wise	0.08	0.16	0.18
lucky	0.36	0.32	NA

Table 1: Cosine similarities between the four adjectives and the corresponding adverbs by position.

The measures show moderate similarities between the *lucky*/*quick-to*-INFINITIVAL and the corresponding adverbs. The similarities hold for the sentence initial and preverbal usage of *luckily*, and the preverbal and postverbal usage of *quickly*, corresponding to high sentence adverbial readings for the former and low manner readings for the latter. This supports the view that the ADJ-*to*-INF pattern adapts itself as required by the semantics of the modifier but does not by itself force a specific interpretation. Closer inspection of the data reveals that *quick-to*-INF pattern shows clear tendencies setting it off from the adverb patterns. *Quick* in this pattern typically combines with verbs of communication and almost always leads to an interpretation targeting not so much the event described by the INFINITIVAL but rather the stretch of time up until that event (cf. Travis 1987), cf. (4).

(4) They may also have been **quick to point out** that Vermuyden's 'Great Design' was already turning sour. [AS4 865]
(4) Tom is **quick to insist** his discoveries have been purely incidental. [ACM 384]

Why are the patterns less similar for *wise* and *slow*? For *wise*, this is driven by a large number of extraposed subject sentences, cf. (5).

(5) a. It is **wise** to use protective boots and an overgirth. [BPB 326]
    b. It's **wise** to adapt accordingly. [CEF 1794]

These sentences are not paraphraseable using sentence initial *wisely*. This partly accounts for the lower similarity; neither *lucky* nor the other two adjectives occur with extraposed subjects in the BNC. For *slow*, the situation is less clear. That it does not behave in parallel to *quickly* might be driven by its inability to measure the time leading up to an event. Thus, its combinations with *respond* all concern slowly developing reactions to events and situations, as in (6).

(6) Western countries for their part have been **slow to respond** to appeals for a WCY fund. [B77 1843]

Whether this type of interpretation is more tied to the *to*-INF pattern and less available for the *slowly* patterns than the preference described for the *quick-to*-INF pattern remains an open question at the moment.

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