Specification of methods and the semantics of method-oriented adverbs

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Main claims
- Method-oriented adverbs are not manner adverbs.
- Method-oriented adverbs relate to events like instrumentals.
- Not causal intermediaries. No causal force to them.
- Facilitating instrumentals making use of a HELP relation.
- Methods come from lexical decomposition of the adverbial or context.

Classification of adverbs and method-oriented adverbs
Classification and analysis of classes of adverbs is a staple in formal semantics and syntax.
- What adverbs mean and their syntactic position.
- Many classes of adverbs identified, with much attention paid to manner adverbs.

Varieties of instrumental adverbs and method-oriented adverbs
Different types of instruments distinguished by their semantics.
- Not all instruments have the same causal force (Koenig et al., 2008).
- Some instruments are causal intermediaries.
- Link in a causal chain between the agent of an event and the affected object.

Questions:
- How do MOAs differ from other classes of adverbs?
- How do MOAs relate to a method rather than a manner?
- How are methods introduced into the semantic representation?

Method-oriented adverbs are not manner adverbs
Different paragrapahs.

- a. The way John fell was clumsy.
- b. The way Noam evaluated the data was slow.
- c. The way Alma categorized the plants is biological.

Paraphrased with methods mentioned explicitly. Reminiscent of instrumentals.

How to link method-oriented adverb to verb? Paraphrases are a clue.
- Method-oriented adverbs are often paraphrasable with use, using and with (Schäfer, 2013).
- Easily links to verb.

Linguistically, Noam evaluated the data.
- a. Alma categorized the plants biologically.
- b. Noam evaluated the data linguistically.
- c. The nations solved their disagreements diplomatically.

Use, using, with often taken to be diagnostic of instrumentals (Lakoff, 1968).

Löbner, 2017
- a. Noam analyzed the data with the help of linguistic methods.
- b. Noam evaluated the data very linguistically.

Linguistically provides a clear case where the methods come from the adverb.
- (17) Noam evaluated the data linguistically.
- (used linguistic methods)
- Method-oriented adverb has the same semantics as the adjective linguistic.
- Adjectives for scientific fields encode scientific methods particular to that field (analysis of morphemes, finding minimal pairs, ...)
- Decomposition of adjective meaning given as a frame, a recursive attribute-value structure (Petersen, 2007; Löbner, 2017).
- Attributes are functional (type (x, e)) with typed values.

Methods come from lexical semantics
- a. The aliens communicated telepathically.
- b. Martha changed the light bulb with a ladder.
- c. The aliens communicated telepathically, which caused the data to be evaluated manually, by sieving or blowing away the debris.
- d. The aliens communicated telepathically, which caused the data to be evaluated manually by sieving or blowing away the debris.
- e. The aliens communicated telepathically, which caused the data to be evaluated manually by sieving or blowing away the debris.
- f. The aliens communicated telepathically, which caused the data to be evaluated manually by sieving or blowing away the debris.

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Weaker causal relation: HELP
Method-oriented adverbials are facilitating instrumentals and make use of a HELP relation.
- (16) $evaluator(e) \land method\_oriented(method(e)) \land HELP(p(e), e'')$.
- (17) $evaluator(e) \land method\_oriented(method(e)) \land HELP(p(e), e'')$.
- (18) $[\text{linguistic}] = \text{language\_object\_of\_study(x)} \land \text{linguistic\_method(method(x))} \land \text{linguist(agent(method(x)))}$.

Methods also come from context
- Manually (= by hand) does not obviously lexically encode methods.
- (20) $[\text{manually}] = \text{hand}(x) \land x = \text{hand}(y)$.
- Many different methods of realization for manually (from BNC). Suggests contextually determined; not determined (solely) by the adverbial frame.
- a. sort and clean the seeds [...]; manually, by sieving or blowing away the debris.
- b. silenced manually at any time by operating levers.
- c. The way John fell was clumsy. (Koenig et al., 2008)
- d. The aliens communicated telepathically.
- e. John solved the problem manually.
- f. The aliens communicated telepathically.
- g. John solved the problem manually.
- h. The aliens communicated telepathically.

Selected references and acknowledgements
This work is funded by DFG Collaborative Research Center 991, project C10.
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