Relation 2: Instrument-Agency

Definition

Instrument-Agency(X, Y) is true of a sentence S that mentions entities X and Y if and only if:

(1) X and Y appear close in the syntactic structure of S (so for example we do not assign the relation to entities from separate simple clauses in a composite clause);

(2) according to common sense, the situation described in S entails the fact that X is the instrument (tool) of Y or, equivalently, Y uses X.

Definition – restrictions

(a) X is an entity and Y is an implied activity or an explicit actor. That is to say, there exists an activity even if the close context for X and Y includes no verb.

(b) The relation is true if the sentence context implies the Y uses X, Y has used used X, or X will likely use Y in the future.

Definition – note

(i) Examples illustrating (a): Instrument-Agency(pump, drainage) means "pump is the instrument of drainage (draining)", Instrument-Agency(laser, printer) means "printer (printing) uses laser", Instrument-Agency(toothpick, digging) means "digging with a toothpick", Instrument-Agency(ax, murderer) means "murderer (murdering) uses ax".

(ii) Example illustrating (b): "The dentist</e1> got the <e2>drill</e2> ready to begin work." implies that the dentist (Agency) will likely use the drill (Tool).

Positive examples

"Very high-speed <e1>laser</e1> <e2>printers</e2> are used for mass mailings of personalized documents."
WordNet(e1) = "n1", WordNet(e2) = "n2", Instrument-Agency(e1, e2) = "true"

Comment: "Laser printer" is also a separate entry in WordNet.

"<e1>Sump pump</e1> <e2>drainage</e2> will give you peace of mind during heavy rainfalls."
WordNet(e1) = "n1", WordNet(e2) = "n1", Instrument-Agency(e1, e2) = "true"

Comment: "Sump pump" is a separate WordNet entry.

"I'm a much better <e1>ax</e1> <e2>murderer</e2> than I was just three weeks ago."
WordNet(e1) = "n1", WordNet(e2) = "n1", Instrument-Agency(e1, e2) = "true"

Near-miss negative examples

"The gain medium transfers external energy into the <e1>laser</e1> <e2>beam</e2>."
WordNet(e1) = "n1", WordNet(e2) = "n3", Instrument-Agency(e1, e2) = "false"

Comment: "Laser beam" is a separate entry in WordNet. The relation here could be Producer-Product: laser makes beam.

"Grindex submersible <e1>drainage</e1> <e2>pumps</e2> are used for pumping fluids with abrasive particles."
WordNet(e1) = "n1", WordNet(e2) = "n1", Instrument-Agency(e1, e2) = "false"

Comment: The relation here is Purpose-Tool: pump is for drainage.

"This is the simplest, safest <e1>axe</e1> <e2>sharpener</e2>, tool sharpener that we have ever used."
WordNet(e1) = "n1", WordNet(e2) = "n1", Instrument-Agency(e1, e2) = "false"

Comment: The relation here is Object (or Theme): axe is the object of sharpening, and "sharpener" is just an intermediary.