Relation 2: Instrument-Agency

Preamble

Levi (1979) has an instrumental relation USE(X,Y) meaning that "X uses Y", e.g., "steam/Y iron/X". Note that the verb *use* can represent two different lexical items: one with an instrumental and another one with an agentive meaning. Only the former sense is allowed by the relation. Thus, "clock/X using electricity/Y" is an instance of the relation, but "villagers/X using electricity/Y" is not.

Moldovan et al., (2004) have a relation INSTRUMENT(X,Y) defined as "an entity X is used in an event/action Y as an instrument", e.g., "pump/X drainage/Y".

Nastase & Szpakowicz (2003) have a relation INSTRUMENT(X,Y) meaning that "Y uses X", e.g., "laser/X printer/Y".

FrameNet has a frame for the concept of "Gizmo", which "contains general words denoting equipment where the use or purpose is not specified by the lexeme but (typically) by a separate expression. The words are described with respect to the Use for which the item is used or its typical User." So the frame includes the complex artifact itself (*machine*, *device*, etc), the Use (e.g., *coffee* in *coffee machine*) and the User who typically uses a particular tool (e.g., *dentist* in *dentist's equipment*).

http://framenet.icsi.berkeley.edu/index.php?option=com_wrapper&Itemid=118&frame=Gizmo&

Definition

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

(1) S, X and Y are in accordance with the general annotation guidelines:

<div align="center">

http://docs.google.com/Doc?docid=dfhkmm46_0f63mfvf7

</div>

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

Definition – Restrictions

(a) X is an entity and Y implies an 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. Examples: "*laser/X printer/Y*" means "the printer uses laser (for printing)"; "*axe/X murderer/Y*" means "murderer uses axe for killing".

(b) The relation is true if the sentence context implies that Y uses, is using or has used X.

(c) Both X and Y can be a physical object, an abstract object or an organization.

(d) Y cannot use their (body) parts as instruments. The restriction is meant to prevent overlaps with Component-Whole. If a method, principle, technique exists on its own, independently of Y (*vacuum/X cleaner/Y* or *microwave/X oven/Y*), than X is an Instrument used by Y instead of an integral and functional part of Y.

(e) People are not usually classified as Instruments, unless they are clearly non-agentive in the situation.

(f) Properties, capabilities, aptitudes, skills, attitutes etc. are not acceptable as Instruments.

(g) Location can be Instrument but only when the use is the emphasis of the sentence ("*People used the trail to reach California*", but not "*People travelled on the trail from Kansas to Dallas*").

Definition – Notes

(i) Animals can be used as Instruments.

(ii) Means of transport can be Instruments.

(iii) Raw materials, materials, ingredients, pieces and all the other things that are used to build, assemble, prepare, are acceptable Instruments. So are power sources and external resources used by machine, device, etc. in operating.

(iv) Wearing, putting on is accepted as a way of using, on the basis that the wearer Y is generally wearing an item X for some reason (to keep warm, carry things in, protect him/herself, etc).

(v) Selling, buying is accepted as a way of using (for a living, or whatever).

Definition - Overlaps

Potentially overlapping relations:

• Component-Whole: distinguished by restriction (d).

• Message-Topic: Only a case of apparent overlap. In contrast to Message-Topic, Instrument-Agency describes the relationship between the communicator and the message or the medium, rather than between the message and the topic.

• Product-Producer: The overlap usually appears when using something implies its production. In this case the Product-Producer relation according to our guidelines is considered more informative.

Positive Examples

"<e1>Carpenters</e1> build many things from <e2>wood</e2> and other materials, like buildings and boats."

Instrument-Agency(e2,e1)

Comment: Raw materials are acceptable Instruments.

"The "underdog" prize is awarded to the <e1>driver</e1> who wins the race with a <e2>car</e2> in the lowest PI of the field."

Instrument-Agency(e2,e1)

Comment: Means of transport are acceptable Instruments (used to run the race).

"Several <e1>municipalities</e1> used <e2>slaves</e2> for public work."

Instrument-Agency(e2,e1)

Comment: Slaves are actually used by the municipalities, they clearly are non-agentive.

"Her <e1>tormentor</e1>, who used the <e2>girl</e2> for his sexual pleasure from time to time, often left her alone for days."

Instrument-Agency(e2,e1)

Comment: The girls is actually used, she clearly is non-agentive.

"Ansari allegdely bombed Jhaveri Bazaar and the <e1>family</e1> took the <e2>taxi</e2> to the Gateway of India."

Instrument-Agency(e2,e1)

Comment: Means of transport can be considered Instruments.

"The <e1>definition</e1> of the vCard Specification made use of a number of existing <e2>standards</e2>."

Instrument-Agency(e2,e1)

Comment: The standards exist independently of the definition, so they can be Instruments.

The <e1>river</e1> once powered a <e2>grist mill</e2>.

Instrument-Agency(e1,e2)

Comment: The grist mill used the river as a power source in its operating. Power sources are acceptable Instruments.

"The <e1>dentist</e1> inserted the <e2>drill</e2> and began work."

Instrument-Agency(e2, e1)

Comment: The sentence implies that the dentist (Agency) is using the drill (Instrument), therefore (b) is fulfilled.

"The other marked feature of a <e1>laser</e1> <e2>printer</e2> is the high quality text and graphics printing."

Instrument-Agency(e1, e2)

Comment: This is a prototypical example for Instrument-Agency.

"I'm a much better <e1>ax</e1> <e2>murderer</e2> than I was just three weeks ago."

Instrument-Agency(e1, e2)

"All <e1>plants</e1> absorb <e2>carbon dioxide</e2> for food."

Instrument-Agency(e2, e1)

Comment: Carbon dioxide is used by plants during photosyntesis to make sugars.

"Francisco Garcia Lorca sees the <e1>horse</e1> carrying the <e2>rider</e2>, against his will, to his death."

Instrument-Agency(e1, e2)

Comment: The rider uses the horse for carrying him.

"A <e1>mediator</e1> is used by <e2>parties</e2> in finding their own answers for the problems before them.

Instrument-Agency(e1, e2)

Comment: The sentence satisfies (a) and (b) - e1 is an entity and e2 is an explicit actor; e2 uses e1.

"A <e1>mediator</e1> is used by <e2>parties</e2> in finding their own answers for the problems before them."

Instrument-Agency(e1, e2)

Comment: The sentence satisfies (a) and (b) - e1 is an entity and e2 is an explicit actor; e2 uses e1.

"The <e1>dentist</e1> lowered the <e2>chair</e2> and began work."

Instrument-Agency(e2,e1)

Comment: We allow indirect Instruments.

Near-miss Negative Examples

"A <e1>midwife</e1> assists the <e2>birth</e2>, and women usually rely on their mothers or other women for support during labour."

Other

Comment: The midwife is involved in the birth, but "assists" imply assistance/collaborative work instead of used by.

Grint shows he's becoming a delightful comic <e1>actor</e1> with a highly flexible <e2>voice</e2>.

Other

Comment: The voice is a skill, aptitude of the actor, cannot be an Instrument.

"The gain medium transfers external energy into the <e1>laser</e1> <e2>beam</e2>."

Product-Producer(e1, e2)

Comment: The laser creates the beam, it does not use it.

"Grindex submersible <e1>drainage</e1> <e2>pumps</e2> are used for pumping fluids with abrasive particles."

Other

Comment: The relation between e1 and e2 is Purpose-Tool: this pump is for drainage (draining). This relation is not in our inventory and thus we have an instance of Other.

"This is the simplest, safest <e1>axe</e1> <e2>sharpener</e2>, tool sharpener that we have ever used."

Other

Comment: The relation between e1 and e2 is Object(Theme)-Agency: axe is the object of sharpening, and "sharpener" is just an intermediary.

The relation between e2 and e1 could be Purpose-Tool: this axe is for sharpening (other things).

"Mercury is way ahead of newcomer V-8's, because it is the one <e1>car</e1> that has always used this type of <e2>engine</e2>!"

Component-Whole (e2, e1)

Comment: The engine is functional, integral part of the car. Restriction (d) prevents the overlap with Instrument-Agency.