Relation 1: Cause-Effect

Definition

Cause-Effect(X, Y) is true for 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 (we do not assign the relation to entities from separate clauses in a composite sentence);

(2) according to common sense, the situation described in S entails that X is the cause of Y.

Definition – restrictions

(a) X,Y can each be a nominal denoting an occurrence (e.g., event, state, activity), or a noun denoting an entity, as a metonymic expression of an occurrence.

(b) In case an effect is caused by a combination of events, each such event is considered a separate cause for the effect.

(c) Indirect causation is considered positive, e.g. Cause-Effect(earthquake, aftershock).

Definition – notes

(i) The Cause-Effect relation implies a temporal relation as well: Cause precedes the Effect. The stronger Cause-Effect relation is preferred if applicable.

(ii) Cause-Effect differs from Source/Origin-Entity/Product-Producer in that the effect is an occurrence, not an entity. The effect may be expressed through an entity, but in the context of the sentence this entity must stand in for/evoke an occurrence.

Positive examples

"A person infected with a particular <e1>flu</e1> <e2>virus</e2> strain develops antibody against that virus."
WordNet(e1) = "n1", WordNet(e2) = "n1", Cause-Effect(e2, e1) = "true"

Comment: flu is a state, virus is the causal agent

"Human <e1>growth</e1> <e2>hormone</e2> (HGH) is a substance secreted by the pituitary gland."
WordNet(e1) = "n1", WordNet(e2) = "n1", Cause-Effect(e2, e1) = "true"

Comment: growth is a nominal denoting an activity, hormone is the causal agent

"Sudden <e1>death</e1> from <e2>inhalation</e2> of petroleum distillates is well recognised in misuses of volatile substances."
WordNet(e1) = "n6", WordNet(e2) = "n1", Cause-Effect(e2, e1) = "true"

Comment: death is a state, inhalation is a nominal denoting an activity.

"I'm going to have a serious <e1>laugh</e1> <e2>wrinkle</e2> problem when I'm older as a result of that evening."
WordNet(e1) = "n2", WordNet(e2) = "n1", Cause-Effect(e1, e2) = "true"

Comment: laugh is a nominal denoting an activity, wrinkle is a nominal standing in for the state of "having wrinkles".

Near-miss negative examples

"Jensen Passive <e1>TV</e1> <e2>Antenna</e2> is perfect for the use with HDTV."
WordNet(e1) = "n2", WordNet(e2) = "n1", Cause-effect(e2, e1) = "false"

Comment: "TV Antenna" is an instance of the Purpose-Tool relation (Antenna is for TV [signal reception])

"Store your <e1>headache</e1> <e2>pills</e2> in these neat rhodium plated cufflinks, for easy access during a long night out."
WordNet(e1) = "n2",WordNet(e2) = "n2",Cause-Effect(e2, e1) = "false"

Comment: pills are meant to oppose headaches in this case, or cause the lack of headaches, so to speak.

"That year, summer students at the VLA made the first discovery of <e1>radio emission</e1> from a brown dwarf <e2>star</e2>."
WordNet(e1) = "n1", WordNet(e2) = "n3", Cause-Effect(e2, e1) = "false"

Comment: While the star can be seen as the cause of the emission, the better relation that fits this example seems to be Product-Producer.