Relation 8: Member-Collection

Preamble

Winston, Chaffin, and Herrmann (1987) performed psycholinguistic experiments to identify part-whole instances based on the way in which the parts contribute to the structure of the wholes. They proposed six subcategories of Part-Whole, namely: Component-Integral, Member-Collection, Portion-Mass, Stuff-Object, Feature-Activity, and Place-Area. The Member-Collection relation represents the membership in a collection. Membership is determined on the basis of spatial or temporal proximity or by a social connection.

Definition

Member-Collection(*X*, *Y*) is true for 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:

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(2) the situation described in *S* entails the fact that *X* is a member of *Y*.

Definition – Restrictions

(a) Members are not functional to the Collection -- they are not in a specific spatial/temporal position with respect to each other. For example, the handle of a cup can only be placed in a limited number of positions if it is to function as a handle. In that case, handle and cup are not in a Member-Collection relation, but in a Component-Whole relation.

(b) Members are non homeomerous[1] -- members are different from their Collection, they are not the same kind of things as their Collection.

(c) Members and Collection are separable -- members can, in principle, be separated from the Collection.

(d) Members and Collection can be abstract.

(e) Nouns expressing a specific quantity, e.g. "cartload", "handful", "cup", are not considered as collections. Every collective term suggests a quantity to some extent, but it is not any strict value: a lot; many; all.

(f) A collection consists of elements of the same type, and the members are to some extent interchangeable.

Definition – Notes

Many collective terms, annotated as such, have an additional meaning. Examples: federation (a kind of political/social union), jungle (lack of order), maze (complexity), rain (downward direction).

Definition – Overlaps

The Member-Collection relation is closely related to the Component-Whole relation. The main difference between these two relations is that Member-Collection does not require members to perform a particular function or possess a particular structural arrangement in relation to each other and to their wholes. In some cases the functional aspect may not be clear.

There is also a potential overlap with the Class-Member relation, but classes differ from collections in that membership in a class is based on similarity to other members on one or more intrinsic property instead of spatial or temporal proximity or social connection.

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[1] Winston et al (1987) elaborated a taxonomy of part-whole or meronymic (from the Greek meros=part) relations based on relation elements. Meronymic relations whose parts are homeomerous (from the Greek homeo=similar and meros=part) have parts that are the same kind of thing as their wholes (slice-pie), while non homeomerous parts are different from their wholes (tree-forest). The terms homeomerous/non homeomerous is widely used for part-whole definitions and characterization.

In accordance with the general annotation guidelines, we consider examples involving motion verbs (e.g. "put", "remove", "run", "enter", etc) that is verbs actually describing a movement activity, as Entity-Destination or Entity-Origin examples, according to the direction of the motion. Note that Member-Collection is not necessarily negated by movement away from the Collection, but if a sentence focuses on movement away from the Collection, we consider Entity-Origin is more salient than Member-Collection.

Positive Examples

"Italian playing cards most commonly consist of a <e1>deck</e1> of 40 <e2>cards</e2>."

Member-Collection(e2, e1)

Comment: A deck is a collection of cards, cards are different and separable from the deck, not functional to the deck.

"The <e1>list</e1> contained <e2>books</e2> of various genres and reading and interest levels."

Member-Collection(e2, e1)

Comment: A list is a collection of things, while books are not physical here and stand for "listable" identifications of books.

"Also, hip-hop graffiti is chosen due to the style, method, and individuals that create these images, as these <e1>individuals</e1> also are a part of the middle-class American <e2>society</e2> that is confronted and affected by the presence of these images. "

Member-Collection(e1, e2)

Comment: Society is an abstract object, individuals are an integral part of the society but not a functional part.

"Mary looked back and whispered: 'I know every <e1>tree</e1> in this <e2>forest</e2>, every scent.'"

Member-Collection(e1, e2)

Comment: This is a typical example of a Member-Collection relation: a tree is part of the forest. It is spatially close to the other trees, separable, and different from the forest.

"A person who is serving on a <e1>jury</e1> is known as <e2>juror</e2>."

Member-Collection(e2, e1)

Comment: A juror is part of the jury, he/she is not functional, non homeomerous, and separable respect to the jury.

"<e1>Ship</e1> <e2>fleet</e2> proposed to fight climate change."

Member-Collection(e1, e2)

Comment: A ship is part of the fleet, she is not functional, non homeomerous, and separable respect to the fleet.

"A <e1>herd</e1> is a large group of <e2>animals</e2> and is a form of collective animal behaviour."

Member-Collection(e2, e1)

Comment: Animals are members of a herd. They are not functional, non homeomerous, and separable.

"That <e1>chair</e1> is part of the old <e2>furniture</e2> that will be put up for auction."

Member-Collection(e1, e2)

Comment: The chair is an item of furniture, and it is not functional, non homeomerous, and separable.

"Driving home tonight I came across this <e1>nide</e1> of young <e2>pheasants</e2>."

Member-Collection(e1, e2)

Comment: This is an typical example of a collective noun for birds.

Near-miss Negative Examples

"One basic trick involves a spectator choosing a <e1>card</e1> from the <e2>deck</e2> and returning it."

Entity-Origin(e1, e2)

Comment: While a card is a member of the deck, the sentence focuses on movement away from the deck.

"The <e1>girl<e1> ran away from her <e2>family</e2>."

Entity-Origin(e1, e2)

Comment: While the girl is still a member of the family, the sentence focuses on movement away from the family.

"A <e1>primate</e1> is a member of the group of <e2>mammals</e2> made up of human beings and the animals that resemble them most closely."

Other

Comment: This is a Class-Member relation. Classes differ from collections in that membership in a class is based on similarity to other members on one or more intrinsic property instead of spatial or temporal proximity or social connection.

"Your <e1>tree</e1> has a <e2>leaf</e2> that is simple (one blade attached to a stalk or petiole)."

Component-Whole(e2, e1)

Comment: This is a Component-Whole relation. Leaves bear specific structural and functional relationships to one another and to the tree.

"The second <e1>chapter</e1> of the <e2>book</e2> offers a brief introduction to Ruby."

Component-Whole(e1, e2)

Comment: This is a Component-Whole relation. There is a functional and structural relationship between a chapter and a book.

References

Winston, M., Chaffin, R., Herrmann, D., A taxonomy of part-whole relations. *Cognitive Science*, 11:417-444, 1987.