APPROACHES TO THE CLASSIFICATION OF MERONYMIC RELATIONS: THEORETICAL AND EMPIRICAL INTERPRETATIONS

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Abstract
The article examines meronymy — the "part–whole" relation — as classified by various scholars, analyzing the theoretical and practical significance of these approaches. The findings of the study enable the effective application of meronymy in linguistics, cognitive psychology, and formal semantics.

Keywords: Partonym, meronym, formal semantics, meronymic relations, cognitive psychology.

Introduction

In lexical-semantic studies, meronymy ("part–whole" relation) plays a significant role in linguistics and cognitive sciences. This relation often manifests through "part-of" expressions, helping to identify the semantic structure of lexical units and the conceptual connections in human cognition. Different scholars have attempted to classify meronymic relations in various ways, with their approaches differing in theoretical foundations, empirical evidence, and levels of formalization. Below, the views proposed by American scholars Winston and Woods, cognitive psychologists Chaffin and Herrmann, American linguists Iris, Litowitz and Ivins, and British linguist Alan Cruse are comparatively analyzed.

Discussion

Winston and colleagues' classification. Winston and his colleagues distinguish meronymy through three main relational elements: Functional (a part performing a specific role within the whole), Homomorphic (a part being similar to the whole or other parts), and Separability (whether a part can be detached from the whole). Based on the combination of these criteria, they identify six types of meronymy: component–whole object, member–collection, portion–mass, substance–object, feature–activity, and place–area. The strength of this approach lies in its simplicity, intuitive nature, and convenience for creating ontological systems, which is why it is widely applied in lexical databases (e.g., WordNet).

Chaffin and Herrmann's empirical psychological classification. Their approach is based on experimental research in which participants are asked to classify various "part–whole" examples. The results revealed subcategories similar to Winston's model but more detailed, with additional "relational elements" identified. This approach is advantageous in that it reflects actual conceptual categorization by people and, unlike purely theoretical models, reveals cognitive processes. Furthermore, it reinforces general linguistic rules with psychological evidence.

Iris, Litowitz, and Ivins' relational family approach. These authors criticize the "property-based decomposition" of Winston and Chaffin. They argue that meronymy should not be broken down into sets of features, but rather be considered as a family of relations. They propose four basic models: functional component, segmented whole, member–collection, and magnitude–set. Such an approach allows meronymy to be seen as an independent set of relations in a complex semantic network, which may be more effectively applied in lexical databases and semantic networks.

Cruse's quantitative approach. Cruse classifies meronymic relations based on quantitative distinctions. He identifies expressions such as:

- "all X are parts of Y,"
- "some X are parts of Y,"
- "X may sometimes be a part of Y."

Thus, the essence of meronyms is determined by the quantitative strength they express. This approach is particularly useful in identifying logical inferences, as it highlights whether semantic relations are obligatory or optional.

Woods' "quantitative label + relational component" approach. Woods develops Cruse's idea, arguing that any semantic relation consists of two elements:
1. Relational component — the type of relation (e.g., component–whole, member–collection),
2. Quantitative label — the degree of the relation (all, some, most, obligatory, optional).
Accordingly, meronymic relations are represented as precise nodes. This approach not only facilitates theoretical analysis but also enables mathematical modeling within Formal Concept Analysis (FCA) and its extension, Relational Concept Analysis (RCA).

Formal Concept Analysis and Relational Concept Analysis. Developed by Ganter and Wille, FCA represents object–attribute relations in the form of lattices. RCA expands this model by including inter-object relations as well. Woods' "quantitative label + relational component" model allows meronymic relations to be mathematically classified within RCA.

Conclusion

Different scholars have classified meronymic relations in diverse ways: Winston et al. — theoretical, simplified model; Chaffin and Herrmann — experimental, cognitively grounded classification; Iris et al. — relational family approach; Cruse — quantitative distinctions; Woods — relational component and quantitative label combined, oriented towards formal modeling. Thus, Winston and Iris' approaches are most suitable for theoretical consistency, Chaffin and Herrmann's for empirical evidence, Cruse's for logical inferences, and Woods' with RCA for computational linguistics and conceptual modeling.

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