

# The Carto-Conceptual Network models of indefinite pronouns and negation: Where linguistic typology meets cognitive linguistics

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This paper introduces a new approach to the comparative study of linguistic functions, called the carto-conceptual network (CCN) approach, and illustrates how this approach works by applying it to actual data sets. This newly proposed approach is based on the research tradition of semantic typology (e.g. van der Auera & Plungian, 1998), but takes on the conceptual space viewpoint on meaning as proposed by Gärdenfors (2000, 2004). This new approach is especially designed to overcome the disadvantages inherent in the two previous approaches to meaning comparison, i.e. the semantic map (SM) model (Haspelmath, 1997), and the multidimensional scaling (MDS) model (Croft, 2008). Specifically, unlike SM, the CCN approach does not rely on the perfect fit principle and is computationally tractable, hence the ability to cope with a much larger data set. Furthermore, unlike MDS, the CCN approach offers a more accurate way of representing geometrically the conceptual proximities between the functions. Moreover, language universals in the form of implicational hierarchy can be represented in a SCN model in a way that the principles behind the model remain consistent. When applied to Haspelmath's (1997) indefinite pronoun data as a test case, this new approach can produce satisfactory results, and some interesting tendencies previously neglected become discernible, such as the historically attested but presently missing functions of a Finnish indefinite pronoun.

CCN is then applied to a new set of typological data, that is, 169 negative constructions across 15 negative functions: Negative Imperfective, Negative Perfective, Negative Predicative Possessive, Negative Existential, Negative Nominal Predicate, Negative Adjectival Predicate, Contrastive Negation, Negative Responsive Interjection, Negative Interrogative, Negative Desiderative (DESI), Negative Deontic Necessitive (NCSS), Negative Optative (OPT), Negative Hortative (HORT), Negative Imperative (IMP), and Negative Directive Interjection. This sample is both genetically and geographically controlled (47 languages in 47 different genera and 5 different areas), and probably the largest and most systematically distributed sample of negative meanings to date. A correlation coefficient analysis is performed on the negative construction data in order to render a conceptual space populated by nodes representing the different negative functions.

Then, the newly proposed optimal route analysis (ORA), which is based on the geometrical techniques of Voronoi tessellation and Delaunay triangulation, is performed on the conceptual space in order to determine probable connections between the functions. It is found that the emergent carto-conceptual pathways reflect some interesting cognitive notions that are relatively understudied in negation, most notably (inter)subjectivity. Specifically, there is a particular pathway that connects from DESI (*You don't want to go*) to NCSS (*You must not go*), to OPT (*May you not go*), to HORT (*Let's not go*), and to IMP (*Don't go*), in such a way that it reflects the continuum of objectivity-(inter)subjectivity (Langacker, 1991; 2008). An important implicational universal can then be formulated: no construction can encode any two negative functions located along this continuum without encoding the negative function(s) located in between. It is finally suggested that more typological data on different linguistic phenomenon be analyzed using this newly proposed method so that it can be further refined.

## References

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