Research Project: "The representation of space across languages and cultures"

Project responsible: Prof. Lavinia Merlino Barbaresi

Scientific scope: B (Humanities: area n.10)

Key words: Language - culture - space - time - linguistics - cognition - acquisition - anthropology - history - text

Scientific description of the project

Basic outline
The goal of this project is to take up and confront the challenging problem represented by the linguistic encoding of space across different languages and cultures, within an integrated, multidisciplinary approach that implies competence in a wide range of different disciplines: cognitive linguistics, anthropological linguistics, text linguistics, acquisition, neuro-linguistics, historical linguistics, ancient languages (i.e. Indo-European as well as non Indo-European), sign languages and a vast panorama of different modern (i.e. European and extra-European) linguistic families and cultures. The scholars concerned with such different sub-fields of linguistics are professors and young researchers ("ricercatori in formazione", "assegnisti") as well as PhD students of the University of Pisa (cf. the list of project members).

State of the art and scientific background
Within the history of speculations on space, the main lines of research, until recent times, can be thus summarized: a) Philosophical investigation; b) Mathematical investigation; c) Epistemological investigation.

Within the last approach, the closest to our research, we can recall psychologically-oriented works concerning the genesis of ideas on different aspects of spatial relations in children (most notably about ordering, topological and metrical aspects) by J. Piaget and, subsequently, by H.H. Clark and D.I. Slobin.

In the 20th century, the cognition of space has increasingly become a major issue for Ethology, Neurology and, eventually, Linguistics. The hypothesis of a universal basis for an ego-oriented, anthropomorphic character of the cognition of space has been recently challenged by researchers such as S.C. Levinson (and other colleagues from the Max-Planck Institute for Psycholinguistics, Nijmegen) as well as by other scholars, whose extended, multidisciplinary approach and massive experimentations have rather warranted a neo-relativistic view of the relationship between thought and language: according to their findings, the cognition of space in human beings would be strongly influenced by culture and language. When languages differ in crucial points, the same happens in the conceptualization of spatial relations. This somehow revived "Whorfian" approach induced a great amount of experimental data as well as a new kind of "semantic typology", mainly concerned with an impressive series of different linguistic structures and expressions collected from most of the world languages, corresponding to different conceptualizations of space. Consequently, any hope to attain some kind of cognitive universal categories about spatiality seems to be quashed, or reduced and confined to a very abstract level.

The present group of researchers will take the lead from the Max-Planck research, in terms of both hypotheses and methodologies. We believe that our investigations on a different array of languages and in areas not fully explored by those scholars may not only expand the experimental data and validate the model, but also contribute to the major theoretical debates involved. What we specifically propose, in order to achieve this goal, is to integrate the neo-relativistic approach with a social-anthropological approach concerning the social nature of space, especially in the light of the theory according to which
space is essential to the construction of power relations within societies (see for example M. Foucault, C. Frake, E. Goffman, A. Duranti). Extra results can derive from our thorough investigations in such areas as acquisition and discourse and from the addition of a diachronic perspective.

Also the category of time has been a major issue for Philosophy and, more recently, for Exact Sciences. But only with modern experimental Psychology the issue of time has become a major topic for psychological studies, with special reference to the perception of time in children (J. Piaget), animals (J.A.M. Merloo) and adult humans affected by pathologies (F.S. DuBois).

Recently, the investigation of time has been a relevant issue for other fields of study, such as Music, Arts and, eventually, Linguistics. While Linguistics has been mainly concerned with temporality within verbal systems (e.g. works by P.M. Bertinetto), our project aims to stress the relationship between aspectual temporality and the localistic theory, as produced by J. Anderson and the Edinburgh school, as well as on the shift from spatial expressions to time/tense expressions, as highlighted by grammaticalization theory and contemporary linguistic typology (see B. Heine, J. Bybee, O. Dahl).

**Detailed description of the project**

1. This research group, which displays a number of experts with a very broad range of different specialistic competence in the fields of linguistics and oriental studies, aims to try and cope with a wide series of topics related to the expression and the cognitive aspects of spatiality and temporality, by investigating (also contrastively) a great number of ancient and modern languages (including Italian sign language and such a so far undescribed language as Gizey, a Chadic language of N-E Cameroon), from a synchronic as well as a diachronic perspective.

Aspects of cognitive acquisition and communication of space and temporality will also be considered, i.e. the genesis of ideas concerning the different aspects of spatial relationships in children, and the complex issue of how spatial and temporal representations are treated in different text types and modes.

Space and time, in their linguistic codification, are not to be seen as conceptualizations of the operatory kind, but they are, rather, perceptual-intuitive categories produced by senso-motorial coordination and by inner/outer immediate perception.

Everyday language presents a weak encoding of the simplest aspects of Euclidean and projective space and it develops to a major extent topological representations (such as proximity, separation, ordering, inclusion, continuity etc.), as they are simpler and more generic representations: indeed, these relations are independent of distance, straight lines, angles, parallels and coordinates; i.e. they are measure- and shape-independent categories. In everyday language, the coordinate systems with angular indications that are closer to Euclidean concepts (e.g. dicotomies such as over/under, right/left, front/behind) can actually be compared to coordinate axes of Euclidean space only to a limited extent. As a matter of fact, linguistic encoding of space and time belong to a pre-operational level of cognition.

Representations of space and time within language depend on phenomenal aspects and contextual associations based on the physical world and tend to be loaded with symbolic functions.

As for what concerns the symbolic values of spatiality, it is useful to cover a further issue within this research: linguistic space is not merely a geographical-ecological space, but a social space, which is determined by the systems of relations which are typical of a given human community. Quite differently from geographical-ecological space, social space is therefore not isotropic, so that in many languages lexical expressions related to spatiality are regularly used to connect physical space and arbitrary differences among members of the community. Social space, in fact, provides an important device for ordering the structure of experience and imposing social control to sub-groups and individuals. This research will not neglect an ethnographic perspective, which will be carried out through the analysis of social uses of space and of the relationship between the phenomenological counterpart of space, i.e. place, and specific discourse strategies. This kind of research will be carried out in particular by researchers working on languages belonging to societies with very rudimental technologies (Ajello).
Spatial conceptualizations projected on temporal categories are numerous in many languages, even in highly technological societies, and they represent an issue that will also be covered by this research, i.e. not only by acknowledging this phenomenon within the parsing of temporal units, but also within the very expression of temporality in the verbal complex (i.e. aspect, as well as other verbal categories) (Ajello).

Space is particularly important in sign languages, which in fact are specifically characterized by a "spatial syntax". In these languages an articulated system of body movements (e.g. of the trunk, of the head) is devoted to the expressions of linguistic categories such as hypothesis, counter-factuality, aspectuality, evidentiality, possible worlds. (Ajello; Mazzoni).

Many of the researchers of this group think that the perspective of social anthropology and the acknowledgement of different cognitive needs within single human communities can provide a clear explanatory basis for contributing some solutions to the main problems that have so far puzzled the current neo-relativistic approach.

In the face of the great variety of expressions concerning spatial concepts, as well as of the wide range of different conceptualizations of space, and given the difficulties of finding conceptual universal categories related to space, the point still in need of explanation is the reason for such a wide variety of conceptualizations. A semantic approach, carried out along the perspective of social anthropology, can give answers to such a basic problem.

2. Besides the description of space relations in different linguistic systems, we believe that relevant elements for understanding the cognitive structure of space could derive from the study of language acquisition. Up to now the semantic analysis of space terms and relations in the development of L1 as well as L2 has been relatively rare, although the grammaticalization of the spatial domain plays a crucial role in the present debate on cognitive universals.

We have already seen that two basic hypotheses are currently proposed. According to some scholars, there is a limited inventory of universal and primitive topological notions (cf. Jackendoff 2002; Talmy 2000), whereas according to others (e.g. Levinson et al. 2003, Croft 2001, Croft & Poole 2004), variation patterns would strongly contradict the hypothesis of a set of universal topological relations. The linguistic variation seems to challenge not only the universalistic perspective, but also the hypothesis of a universal conceptualization of spatial relations, thereby implying strong anti-nativist consequences for language acquisition.

A different but strictly related way of setting the issue of language and space is to understand the role of spatial conceptual categories in the general organization of human linguistic system. In this case, the key issue is not only how we talk about space, but also how the way we perceive, represent and act in space shapes the way we talk and understand the world in general. For instance, within the cognitive linguistic tradition (cf. Jackendoff, Langacker, Talmy), the repertoire of conceptual categories used in the spatial domain is typically assigned an overall primacy in human cognition, with linguistic domains other than the spatial one actually being modelled in terms of the same set of spatial categories (or some sort of analogical and metaphorical extensions derived from it). The hypothesis of the crucial role of spatial dimensions to shape the overall human cognitive system has recently received new experimental support in cognitive psychology and neurosciences, which have brought compelling behavioural and neuro-imaging evidence supporting the idea that the human conceptual system is deeply rooted and interlinked with sensory-motor modules.

We believe that crucial evidence in favour of the grounding of linguistic and conceptual spatial structure in sensory-motor systems could be derived from the empirical study of language acquisition. In particular, the relevance of spatial dimensions in making the human cognitive system of children could be tested through longitudinal analysis.

Within the thematic areas sketched above, we would like to focus on the learning of motion prepositions and verbs in both the processes of L1 and L2 acquisition. In detail, the different stages of the
acquisition of spatial semantics in Italian as L2 will be investigated with experimental texts. The data collected will contribute to the ongoing debate regarding the central role of spatial language in language learning. Finally, we will aim at evaluating to what extent the linguistic phenomenology of spatial expressions can be interpreted simply turning to universal, abstract topological notions (Marotta, Barbera, Peroni).

3. Within the very large body of linguistic research on spatiality, the textual dimension has remained largely unexplored or only very marginally hinted at (e.g. mainly within literary semiotics). Still, space in text, as well as time, are significantly relevant on many grounds. In fact, text relies on major, intrinsic aspects of spatiality and temporality, correlated to its constitutive principles.

Firstly and most fundamentally, in its linear and cyclical progression, a text creates a space and a time spell, which allow reference to the localization of contents, referred to, for example, with as said above, fore-mentioned, later on, from now on, etc. Sometimes, the text is a container wherein ‘objects’ are placed or move within boundaries, with frequent reference to such limits (within the scope of this text). Or it is an organized structure in which each component occupies a space regulated by causal or temporal sequentality, with its size being predetermined by the item’s relative importance in the text economy. Moreover, the indexical character of cohesion regulates the mutual location of a chain of referents in the textual space and their complex relationships, whose spatial and temporal nature is expressed by terms like antecedent, postcedent and qualified by such features as proximity/remoteness.

The textual dimension is also capable of highlighting the very close ties between the domains of space and time, which in a text are often coincident or at least strictly congruent. The progression of space along the text linearity is also a temporal progression along what we can call text diachrony. The two dimensions are not to be conflated: they run parallel and each is differently signalled by expressions in the text (e.g. previously vs. above) and has a different relevance across text types and modes of expression.

Cross-cultural variation will substantially affect texts in their expression of space and time and their organization and progression, which may be an interesting aspect to be dealt with within contrastive textology and in connection with the major debate on cognitive variability across different cultures and with the opposition between language universalists and relativists.

In particular, among the present group of researchers (specified for each section), text (monologic and dialogic) will be investigated along the following topics, in relation to a plurality of languages:

1) text space, as created by the linear and cyclical progression of content and as the referential space of representation. Relevant notions are, for example: elements/objects’ located in the ‘phoric’ chain, micro vs. macro-text, foreground vs. background, mutual location of thematic points (information structure), main body vs. digressions and footnotes (Foschi, Merlì Barbaresi);
2) dual function of text space along the two axes of contiguity and association; i.e.: surface text vs. context or intratextual vs. intertextual dimension, dynamics between visible vs. latent contents, linear progression vs. circular perspective; the notion of text as a complex spatial network of lexical elements (Bertuccelli, Masi);
3) the coincident planes of spatiality and temporality in the progression of text and their mutual significance will be analysed within a theory of text complexity (Merlini Barbaresi; Caravedo);
4) the representation of space and time in the various text types and modes, e.g. the different management of space and time in descriptive, narrative and expository types. The concepts of time and space contribute in making up the concept of motion, which is another interesting component of the descriptive type (Merlì Barbaresi; Caravedo);
5) the space domain and its correlates: vision and other sensory domains (Bertuccelli, Cappelli, Masi, Demi);
6) shared context in face-to-face conversation vs. unshared or virtual context (Bruti, Masi);
7) management of personal and social space in interactional encounters across different languages and cultures: evidence in the text (Bruti);
8) turn-taking and floor management along conversational interactions: a contrastive approach (Merlini Barbaresi, Bruti);
9) the autonomous figurative power of words: the collapse of verbal expression into iconic representation, as in poetry, advertisements, cinema, etc. Texts as objects in space, shaped, sized and conveying extra meanings (Merlini Barbaresi).

4. The long-time span that characterizes the material provided by the linguistics families more traditionally pivotal to historical linguistics (i.e. Indo-European, Chamito-Semitic; but also Dravidic, etc.) offers the possibility to a diachronic approach, i.e. an observation point on how the treatment of these phenomena in human languages changes through time. The history of anciently attested languages, can, in other words, provide material concerning the evolution of the linguistic encoding of space and time, not only in terms of a single grammatical phenomenon (e.g. tense-aspect structures within a verbal system), but also in terms of a general overview of the aforementioned variation within a language through time.

The amount and the complexity of the linguistic categories devoted to the expression of space and time phenomena should be then considered as a whole. The study of this diachronic evolution should then be in terms of decreasing / increasing of complexity; of number of formal categories, etc., and it should also include traditionally favourite fields of research (i.e. verbal systems), as well as less treated topics (e.g. the morphological variability of adverbs in ancient Indo-European and its implications for diachronic typology).

Relevant issues within this part of the research can be summarized in the following points:
- Analogies and differences within the developments of other semiotic systems (i.e., primarily, writing systems), which might include the study of a range of the different cognitive principles involved, like metaphorical and/or metonymic processes.
- Grammaticalization patterns in their most recurrent forms (e.g. from concrete to abstract, from space to time, etc.). This includes the possibility of exploring less attested paths, whose traces are more likely to be found in languages endowed with a good historical record.
- Areas of linguistic encoding where space and time overlap (e.g. prepositional systems) and even develop new categories from each other.
- The somewhat "marginal" set of a-temporal and a-spatial concepts: i.e. eternity, infinity etc. and its lexicalisation; or the absence of spatial and temporal coding (e.g. the lack of a tense category in verbal systems) and its consequences for the development of verbal morphology.

All these different angles (as well as others, that desirably could emerge as the research goes along) should eventually line up, in the final stage of this research, in order to provide answers to such questions as: does the way space and time are conceptually structured across languages display a variation that occurs consistently even through time? Is this hypothetical diachronic variation analogous in some way to the typological / synchronic variation? Are influences of cognitive principles and phenomena on diachronic variation the same as those observable on synchronic data? Is there any kind of evolution within these historical processes or just recurring paths?

While the linguistic encoding of space and time phenomena is increasingly offering reflections on issues central to linguistic theory, like the universal or relative character of grammar, it can be reasonably hoped that a new perspective on its diachrony would bring about a new set of parameters relevant for historical linguistics (if not for the history of language itself).

**Methodology and research phasing**
First year: collecting of data; bibliographical research. Second year: evaluation of data; workshops among project members and integration of different approaches.
The entire research will be carried out within a multidisciplinary approach and the final stages will be devoted to the comparison of the results achieved by each of the sub-fields involved in the project.

**Bibliography**
A full list of bibliographical references ([general references](#); selected bibliography of project members) can be found at: <http://www.humnet.unipi.it/dott_linggensac/EST.html>

**Project members** (devoted time by each member: 3 months per year)
Prof. Roberto AJELLO (African languages; Italian sign language; cognitive and anthropological linguistics); Prof. Alessandra AVANZINI (Semitic languages); Dr. Massimiliano BARBERA (cognitive and anthropological linguistics); Prof. Marco BATTAGLIA (historical linguistics; Germanic languages); Prof. Antonio BERTACCA (historical linguistics; English; verbal classes); Prof. Marcella BERTUCCELLI (cognitive semantics; English; Italian); Prof. Françoise BIDAUD (historical linguistics; French; Italian); Prof. Donatella BREMER (historical linguistics; German); Prof. Silvia BRUTI (text linguistics; English; Italian); Dr. Gloria CAPPELLI (cognitive semantics); Prof. Rocio CARAVEDO (cognitive linguistics; text; Spanish); PhD student Tommaso CASELLI (computational linguistics); Prof. Daria COPPOLA (acquisition); PhD student Silvia DEMI (space semantics) Prof. Pietro DINI (historical linguistics; Baltic languages); Prof. Marina FOSCHI (text linguistics; German); Prof. Marianne HEPP (text linguistics; German); Dr. Alessandro LENCI (acquisition; computational linguistics); Prof. Giovanna MAROTTA (acquisition; phonetics); Dr Silvia MASI (“Ric. in formazione”: cognitive semantics; text); Dr. Laura MAZZONI (Italian sign language); PhD student Linda MEINI (cognitive linguistics; Italian); Prof. Lavinia MERLINI BARBARESI (text linguistics; English); Prof. Filippo MOTTA (historical linguistics; Celtic languages); Prof. Florida NICOLAI (acquisition; neuro-linguistics); Dr. Andrea NUTI (historical linguistics; Celtic languages, classical languages); Prof. Emanuela PANATTONI (historical linguistics; Dravidian languages); Prof. Roberto PERONI (L2 acquisition); Prof. Saverio SANI (historical linguistics; Sanskrit).

**Project evaluation parameters ("indicators")**
a) Interest and scientific relevance of the project on the international platform; b) its promising impact in terms of scientific advances; c) clarity and verifiability of objectives; d) suitability of the theories and methodologies adopted; e) competence and expertise of the researchers involved; f) their internal coherence and complementarity; g) overall adequacy of human and technological resources, h) overall feasibility in terms of scientific constraints and in terms of finance and timing.

**Departments involved**
Linguistics; English Studies; Oriental Studies; Romance Studies; (administration: Dept. of Linguistics).

**Referees**
Prof. Anna Giacalone Ramat (University of Pavia); Prof. Wolfgang Dressler (University of Vienna).