

**On the pragmatic approach to map analysis.
Remarks on the basis of MacEachren's approach to map semiotics.**

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Traditional division of semiotics

Map semiotics can be already considered as a well established specialization in the framework of the theoretical cartography. Most authors identified with the field usually allude to the classic division of semiotics proposed by Morris (1938). As we remember, he has divided semiotics into three main branches: semantics, syntactics and pragmatics.

While I agree with the Morris division of semiotics, I am deeply unsatisfied with the way this division is applied in most studies in theoretical cartography. This is why below I would like to propose a new approach to the definition of these three sub-fields of semiotics in the cartographic context. I am particularly interested in the role pragmatics, currently one of the most dynamically developing branches of linguistic theory and in the same time a relatively neglected aspect of cartographic theory. While in the past three decades we are witnessing a growing number of pragmatic theories, concepts and syntheses as well as institutional developments like journals, books or conferences, most works on cartographic theory still draw on oldest classics in semiotics, some of them almost one hundred years old. Of course, the classics are never outdated. Plato or Aristotle, just as founders of semiotics will never lose their validity, but their discussion in context of modern applications should, as it seems to me, be followed by a review of more recent developments in the relevant fields.

MacEachren's approach to map semiotics

In the present paper I would like to concentrate on a well known and influential synthesis of modern cartographic theory by Alan M. MacEachren (1995). I would like to use MacEachren's account of map semiotics as presented in "How Maps Work" as an example of the dominating approach to pragmatics in modern cartographic theory, which as I have already mentioned, needs in my view urgent update.

MacEachren (1995) approach to map semiotics is based on two classic authors. Peirce and Saussure, who were active at the turn of the 19 and 20 century. Later some more recent authors are mentioned like Odgen and Richards (semiotic triangle -1923), Sebeok (typology of signs, 1976) or Barthes (connotation -1976). Even if we would consider the authors mentioned by MacEachren as representative for modern semantics, they are undoubtedly not representative for the entire semiotics. The main neglect of the MacEachren choice of his classic authors is in my view that they are representing only one branch of semiotics, namely - semantics. Both syntactics and pragmatics are clearly forgotten. While I am personally skeptical about potential of

analogies between natural language and map grammar, just as Robinson and Petchenik (1976) were, I am convinced that the field of map syntactics deserves much more detailed discussion. In a book aspiring to the status of modern synthesis of cartographic theory map syntactics could be assigned its own chapter instead of common treatment with map semantics. This could also allow for a separate discussion of selected theoretical foundations of linguistic syntactics and their application in cartographic theory. Thus, such authors as Chomsky and his generative grammars could be mentioned. It seems that the analogy between rules of sentence generation and rules of generation of complex map signs as well as and their formal relations in a map is worth discussing in this context. However, MacEachren in his discussion of the field alludes only to selected classics of cartographic theory as Bertin.

MacEachren's approach to map pragmatics

The same criticism could be directed towards the discussion of map pragmatics. Although pragmatics has been awarded its own chapter in the book, the text clearly lacks any references to theoretical foundation of the discipline. There is no mention of any classic of linguistic pragmatics or discourse studies as Austin, Leech, Levinson, Searle or van Dijk. Instead we find allusions to older works of authors most often identifies with semantic school in linguistics like Eco or Guiraud. As a result the chapter is full of typically semantic notions as "codes", "connotations" or "truth". Typical pragmatic notions of "context" (e.g. sociocultural context), "action" or "power" seem to be marginalized. Most of the fundamental pragmatic terms are not mentioned at all (e.g. speech act, relevance, cohesion, genre etc.). Some of them appear only in the introductory section on semiotics. Thus, for example the notion of discourse is mentioned (a section on "typology of discourse"). However, instead of references to some classic of discourse analysis we find the old works of Morris as the main reference.

Lack of references to any modern literature on linguistic pragmatics in MacEachren book resulted in what I perceive as largely unfortunate understanding of this discipline and more particularly strange definition of the fundamental opposition between semantics and pragmatics. This opposition, if clearly defined, can in my view, best explain the nature of these two branches of semiotics.

Let me remind that according to the Morrisian tradition semantics was usually defined as the study of meaning of language forms while pragmatics as the study of effective action with the use of language forms. MacEachren defined the opposition between semantics and syntactics of map signs on one side and map pragmatics on the other in terms of opposition between a functional and lexical approach to map representation. I would like to criticize this approach for few reasons.

First, I would not agree with 'functional' and 'lexical' labels attached to semantic and pragmatic approaches respectively. Term 'functional', in my view, is much more adequate to the pragmatic analysis which has clearly functional character in contrast to the semantic or syntactic approach. Typical questions of pragmatic analysis would include "what are the functions (e.g. social/ideological) of a particular map?", "what aims the author of a map plans to achieve?" or "what is the role of specific cartographic conventions?".

The term "lexical" seems to me absolutely inadequate to cartographic analysis. In my view any metaphors suggesting comparisons with natural language "words" or other

forms such as sounds seem unfortunate. I have argued elsewhere (Zarycki, 1998) against simplified comparisons between "cartographic language and map language". I have criticized the parallel between "words" in natural language and "signs" on a map supporting the comparison in a "deep/concept" dimension. Instead of signs, which would be units of map in the surface dimension, I proposed that in the deep level we could talk about "cartographic objects" or "map objects". Map objects could be defined as all units, entities which are perceived as wholes by map users. I have related them to "propositions" in the linguistic analysis. One can note that the opposition between the analysis of map on the surface level and the deep/concept level, which has been earlier suggested by Head (1984) and Schlichtman (1985) could be related to the opposition between semantic and pragmatic approach in cartographic theory.

Assumption of this point of view implies my criticism of MacEachren's (1995:234) claim that signs should be the basic units of analysis of all three branches of semiotics. In pragmatics the main object of study according to MacEachren would be the relation between sign-vehicle and interpretant. In my view interests of pragmatics could be rather defined as study of relationship between maps and their users. From such perspective not the role of particular signs should be the main focus of interests but the role of whole maps as tools of social action. Only taking this level of analysis as a point of reference we can study how particular elements of a map serve its main aim.

Map semantics vs. map pragmatics

In order to better expose this point of view, below I will discuss some other aspects of the semantics-pragmatics opposition as I view it. I must of course admit, that my point of view on the issue is not the only one to be found in the literature of linguistic pragmatics. For some, the issue of semantics-pragmatics opposition is still a topic of contention and a lively debate which is far from over. One of the radical points of views in this respect argues that drawing of any clear line dividing areas belonging to semantic and pragmatics is impossible.

However, assuming the possibility of clear division between the two branches of semiotics I will start my discussion from the issue of meaning. While semantics studies meaning as a fixed characteristics of signs, or absolute notion, in the perspective of pragmatics meaning is contextual. It may not only depend on the persons (interpretants in the language of semantic theory) assigning different meanings to the same signs. Moreover meaning can depend on different situations (the same person may differently interpret the same signs in different contexts). Finally, I as I have already mentioned, in the pragmatic perspective it may be questionable if meaning should be assigned to universal "signs" or rather deeper units such "propositions". Such doubts may arise when we take into account that different interpretants may differentiate different basic units in the same message. In case of a map readers may identify differently its elements.

Thus, context becomes the key notion of pragmatic analysis. While the notion of context is fundamental for this approach it is not easy to define. In general terms one could propose to define context as information on circumstances of a communicative event which is indispensable for full understanding. One can say that context in such view is a contextual notion. For different persons, and in different situations, different additional information will be needed. One kind of context is what MacEachren called the socio-cultural context. Another kind of context may be defined

as the roles of persons involved in a communicative act. In any case, while in the pragmatic analysis the meaning of a message, thus also of a map, can only be understood in relation to the context in which the message appears, semantic analysis builds models assuming stable meanings of stable signs in which notion of context is not envisaged.

Map making as action

Another key issue in the definition of the pragmatic approach is the perspective in which communicative acts are perceived as actions. These actions have their aims which can be also understood as the pragmatic meanings of messages. In other words, establishing meaning of a message would equal to determining the aim with which a given message was produced. Thus, this approach could be contrasted with the traditional approach of the communication theory. Let me remind that according to the traditional model widely known in cartographic theory under the label of "model of cartographic communication" (e.g. Koláčny, 1969) the map serves as a channel transmitting the information about reality from the cartographer to the map user. In such a perspective the quality of this process can be assessed. In other words we can judge to what extent the information received by the map user was accurate, objective and complete. In contrast, pragmatics sees the same phenomenon as purposeful action in which cartographer (or map maker) intends to influence the actions of map user. In particular aim of the cartographer may be to provide knowledge on some area, however the way in which this area is represented may be related to some other aims besides giving information which is considered to be objective. In this place I must agree with MacEachren who in his chapter on map pragmatics mentioned such studies by Wood (1992) or Harley (1990) which are perfect examples of pragmatic or map discourse analyses. Also the notions of power, persuasion and ethics which he mentions in this chapter are highly relevant from the point of view of pragmatic analysis.

A very important achievement of linguistic pragmatics was recognition of the fact that not all communicative acts can be considered as a mere transmission of information about some "reality". As it was for example shown by Austin (1962), there exists a whole class of communicative acts which have "performative" character. They do not describe any reality but they do create it. In cartography we could find enormous number of examples for maps "creating" reality rather than describing it. State boundaries before they are marked "in reality", first are drawn by politicians on maps attached to official documents. All administrative borders come into being only after being drawn on the maps. Thus it is impossible to judge the precision, correctness or the objectivity of a map defining a new border. It does not describe any reality, it creates it.

Thus, in pragmatics the semantic criteria of truth, precision or objectivity are replaced by criteria of social acceptability, adequacy to situation or effectiveness (from the point of view of the assumed aims). In case of a maps defining new administrative borders, the question "is it objective" would be replaced by the question "is it acceptable?" (for example for all parties involved in an agreement on a new division of a country). Let me give some examples for less extreme cases. While the semantic question in an analysis of a city map could be "does the location of the sign depicting a church is correct?" the pragmatic question could be "will it be acceptable for map users that the map includes information only on the location of Christian churches?".

In context of this remark I would like to formulate my final criticism towards MacEachren's approach to pragmatics. When he entitles his chapter on map pragmatics "a lexical approach to map representation" I have to object not only to the notion of "lexical approach" which I already did, but also to the notion of "map representation". As I have explained above, pragmatics in contrast to semantics should not be directly interested in the issue of "representation" of reality but rather of its "construction" or "negotiation". Thus I find MacEachren's emphasis on representation unfortunate in the given context.

Transmission of information vs. interaction between map makers and map users

One can say that pragmatic analysis sees communication as an interactive process. Map making in this perspective should not be seen as a one way process of transmission of information from map maker to map user. Instead it is seen as an interaction between them. Map maker acts with the intention to influence the actions of map user (the maps undoubtedly influence our actions, for example by saying us where we should or should not go). On the other hand, map makers can be influenced by map users by their actions (e.g. by buying or not certain maps, visiting certain places etc.). In fact this interaction may not necessarily be seen only as relations between the actual map-maker and map-user. It may happen that in light of pragmatic analysis map maker will appear only as a tool of some higher level actor. For example map makers can act under influences of politicians or different institutions. The same can be true for map-users who may appear to be only mediators in a more complex interaction. Thus for example map may affect those for whom the actions of map-users are important. An owner of a super-market chain may be highly critical about the map which does not include the location of one of his shops. Therefore, although the shop owner is not a direct map-user he can enter in the interaction with those who ordered the map (not necessarily map makers). These circumstances, the interactions between people not directly using or making maps are typical examples of context of maps functioning which a basic pragmatic notion and may be necessary for understanding of map content.

Another reason for which the traditional one-way model of cartographic communication appears to be less attractive from pragmatic models of interactive influence between map maker and map user is the development of geographic information systems (GIS). With their advent the notion of "user defined maps" (Kelnhofer, 2000) appears. One can say that process of mutual influence between map maker and map user becomes formalized in GIS and the direct influence of map user on the map is thus officially recognized. Not surprisingly, especially those developing "user models", the interfaces intended to ease the interaction between the computer system and its user are among most interested in pragmatic approach to map analysis (e.g. Lindholm and Sarjakoski, 1994).

Conclusions

One could say that while the semantic analysis of maps will concentrate on the assessment of the extent to which criteria of the objective map-making (or of "rules of objective representation") are fulfilled by particular maps, the pragmatic analysis should concentrate on the establishing the nature of the actually functioning social and other criteria of acceptability of maps. Thus the semantic question "in what aspects a given map violates the criteria of objectivity?" could be contrasted with the

pragmatic question "how criteria for a >good map< differ in different contexts (different cultures, conventions, times or institutional settings etc.)?"

The above presented discussion of the semantics-pragmatics opposition could be summarized in the following table:

Map semantics	Map pragmatics
Meaning of map forms	Action with the use of map forms
Stable, absolute meaning	Contextual meaning
Signs	Map objects
Surface-level analysis	Deep/concept - level analysis
Normative approach	Descriptive approach
Objectivity, representation	Relativity, functionality
Information transmission, one-way model of cartographic communication	Social interaction, mutual influence
Map as a tool description of reality	Map as a form of creation/negotiation of reality. Map as a tool of symbolic domination.
Rules of cartographic communication are objectively given and must be respected	Rules which govern the cartographic communication are unstable and must be established, analyzed and related to some social context of their existence.
Maps are created by cartographers on the basis of their knowledge about reality	Maps are designed not only by those who make them but also by those interests of whom they serve. Maps appear to be under (direct or indirect) influence of their potential or actual users.

The intention of this paper has been first of all to propose a clear distinction between semantic and pragmatic approach in map semiotics. In my view, the existing cartographic literature neglected this issue. Since the recent developments in linguistic pragmatics have been largely ignored by cartographic theorists, I see an urgent need for establishing a better link between map semiotics and modern pragmatics. This paper was only envisaged as an introduction to such an endeavor. In the near future I plan a more systematic attempt of application of notions linguistic pragmatics into cartographic theory.

Finally I would like to emphasize that my criticism of MacEachren's "How Maps Work" was rather a pretext for this paper rather than its main aim. The author of this highly influential and valuable book was chosen by me as the aim of my criticism because his work represented very well the dominating way of thinking about map semiotics. Thus it provided me a good point of reference for presentation of my own point of view on this field, but does not imply that I value his works less than other classics of modern cartographic theory.

References:

- AUSTIN J.L. (1962) *How to do things with words*. Oxford: Clarendon Press.
- BARTHES, R (1967) *Elements of Semiology*. London: Cape.
- HARLEY, J.B. (1989) Deconstructing the map. *Cartographica*, 26(2).
- HEAD, C.G. (1984) The map as natural language - a paradigm for understanding *Cartographica* (31)1.
- KELNHOFER, (2000) *User Defined Maps - Cartography without Cartographers ?* Paper presented at the ICA Commission on Theoretical Cartography Seminar in Dresden, October 14-15 October, 2000.
- KOLÁČNÝ, A. (1969) Cartographic information: a fundamental concept and term in modern cartography. *Cartographic Journal* 6(1).
- LEECH, G. (1983) *Principles of Pragmatics*, London: Longman.
- LEVINSON, S.C. (1983) *Pragmatics*, Cambridge: Cambridge University Press.
- LINDHOLM, M. and SARAJAKOSKI, T. (1994) Designing a Visualization User Interface, (in:) A.M.Eachren, D.R.Fraser Taylor (eds.) *Visualization in Modern Cartography*. Pergamon.
- MacEACHREN, A.M. (1995) *How Maps Work. Representation, Visualization, and Design*. New York, London: Guilford Press.
- MOORIS, C. (1938) *Foundations of the theory of signs*. Chicago: Chicago University Press.
- ODGEN C.K. and RICHARDS I.A. (1923) *The Meaning of Meaning*. New York: Harcourt, Brace & Co.
- ROBINSON, A.H. and PETCHENIK, B.B. (1976) *The Nature of Maps*. Chicago: University of Chicago Press.
- SCHLICHTMANN, H. (1985) Characteristic traits of the semiotic system 'map symbolism', *Cartographic Journal*, 22
- SEARLE J.R. (1969) *Speech acts*. Cambridge: Cambridge University Press.
- SEBEOK T.A. (1976) Problems in the classification of signs, (in:) T.Sebeok (ed.) *Contribution to the Doctrine of Signs, Volume 5, Studies in Semiotics*, Bloomington: Indiana University Press,
- van DIJK, T. (1977) *Text and Context*. London: Longman.
- WOOD, D. (1992) *The Power of Maps*. New York: Guilford Press.
- ZARYCKI, T. (1998) Towards the theory of structures of maps in their deep/concept dimension. *Cartographic Journal*, 35(1).