Exploring human dimensions of multifunctional landscapes through mapping and map-making

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Abstract

The question of the relationship between humans and their environment has been one of the geographers’ main challenges during this century. It has been approached from different geographical angles using various methodologies. Maps have always been present in geographical research and they constitute important means in research within other disciplines as well. Mapping and map-making, however, implies many theoretical questions, which have to be taken into account particularly when used in human landscape research.

This article reviews the ways in which drawn maps as a mode of analysis and representation have been exploited especially in human geography and discusses how mapping might bridge human and natural sciences into landscape research. The focus is on three geographical orientations, namely behaviourism, humanistic and cultural geography. Additionally, two mapping techniques, mental mapping and concept mapping, are presented.

So far, drawn maps, such as mental maps, have primarily been used in research on urban environments. Moreover, especially mental maps, which have been favoured by the behaviourists, have encountered severe critique by the representatives of humanistic and cultural geography due to the limited view on the relationship between humans and the environment. Still, I suggest there are many possibilities for the use of drawn maps in human landscape research to be further discussed and exploited in practice. © 2001 Elsevier Science B.V. All rights reserved.

Keywords: Mapping; Mental map; Concept map; Multifunctional rural landscape

1. Introduction

Geographers have always been interested in maps. Traditionally, maps have been regarded as abstractions of reality, which provide objective information about the world surrounding us. Today, however, maps are increasingly thought of as products of culture reflecting the worldviews of the cartographers or the map-makers (Dorling and Fairbairn, 1997; Pile and Thrift, 1995; Cosgrove, 1999).

Production of maps is always preceded by mental interpretation of the world, by mapping. Accordingly, drawing a map is assumed to be more than simply communicating information cartographically (Corner, 1992). As Lilley (2000) argues, map-making is a creative process like writing a text, it is a response to the environmental perception and the geographical imagination of humans. Therefore, it provides a way of exploring what is ‘out there’ as well as what is ‘inside us’. As a mode of representation, all maps might serve as objects for examining human perceptions of the landscape. In this article, however, the focus is on mental and concept maps, which have been prepared intentionally for studying the relationship between humans and their environment.

Mental mapping is no longer a novelty among geographers. Geographers tend to see mental maps...
primarily as (1) cartographic representations of how people differ in their evaluation of places and (2) freehand maps that people can draw (Tuan, 1975). Mental maps have especially been associated with the behavioural approach. The geographers’ enthusiasm for theoretical discussions and the empirical use of mental maps was probably at its greatest during the 1960s and 1970s. The criticism of positivism and the development of humanistic, and finally culturally orientated geography in the 1990s, have produced new approaches and methodologies for examining the human dimensions of landscapes, but the act of mapping as a way of reading a landscape has been relatively neglected (Lilley, 2000). Contrary to mental mapping, concept mapping is more commonly known in other disciplines than in geography. In short, the latter mapping technique is concerned with the conceptual structures of the human mind and their graphical display.

The aim of this article is to review mapping techniques and discuss their use when studying human perceptions of multifunctional rural landscapes. First, I will examine the application of mental maps in the light of three geographical orientations, namely behaviourism, humanistic geography and cultural geography. Then the idea of concept mapping and some of its applications will be presented briefly. The main idea of this article is to bring these techniques into multifunctional landscape research and to discuss their applicability when trying to bridge human and natural sciences into landscape research. The characters of the two mapping techniques are rather distinct: mental mapping always has spatial connections, whereas concept mapping is purely related to conceptual structures and processing of landscape issues. I assume that they might bring forth human dimensions of multifunctional landscapes both as separate techniques and combined.

Due to the integrated character of this article, the use of the concepts environment, place and landscape needs to be discussed here briefly. The commonly used and contested concept environment will be used in its general sense, meaning everything that surrounds us, including both the natural and the human-made environment. While the environment is the object of research in several disciplines, from natural to human sciences, the study of places, instead, is rooted in humanistic geography. Agnew (1994, p. 263) suggests that there are three major elements interwoven in the concept of place: locale, the settings in which social relations are constituted; location, the effects upon locales of social and economic processes operating at wider scales; and sense of place, the local structure of feeling. When using the concept of place, I aim to stress the subjective and unique character of the environmental experience.

Landscape is also a very complicated concept. Although it has been an object of study for centuries, landscape has increasingly been used as an intermediary concept when studying the relationship between the human and the environment. In this article, landscape includes all the meanings of the concepts introduced in the history of landscape research: the visual scene, the area and the way of seeing (Raivo, 1996). The multifunctional landscape is a rather new concept introduced by landscape ecologists. It is commonly understood as a co-existence of different spheres of landscape, such as ecology, economics, culture, history and aesthetics (Tress and Tress, 2000). In this article, the multifunctional landscape is understood as a system of landscape qualities, functions and human values, which interact with the economical action.

In this article, these concepts will be used in relation to each geographical orientation in which they have been in a central position.

2. Appearance of behavioural geography and mental mapping

The idea of the mental and cognitive map was introduced by the psychologist Tolman (1948) to account for the fact that rats, and presumably also humans, respond not only to specific and successive stimuli in the environment, but to entire environmental fields. In addition to Tolman’s work, early landmark studies in this field are: Trowbridge’s (1913) study of imaginary maps; Lynch’s (1960) study of images of the city; Lowenthal’s (1961) study of environmental images; Wolpert’s (1964) study of decision-making processes. These studies actually established the basis for behavioural geography and the notion of spatial cognition in the late 1960s and early 1970s.

Since then, spatial cognition and environmental representations in memory have been important
research areas both in geography and cognitive psychology. These two disciplines have shared an interest in encoding processes, internal representations and decoding processes used with internal representations for decision-making. Spatial cognition is based on the assumption that certain environments have unique characteristics that make their cognitive representations especially interesting, and that some types of spatial behaviour are uniquely tied to certain characteristics of the environment through these cognitive representations (Lloyd, 1999). As the behaviourist’s main interest is addressed to the processes relating to spatial cognition and human behaviour, drawing a map has constituted an essential mean for studying those processes.

Although cognitive theorists and behaviourists differ in some respects (for example, in the consideration of the habitual movement), both perspectives tend to regard the body as passive—as an inert entity which responds either to orders from the cognitive consciousness or to stimuli from the external environment (Seamon, 1979). In seeing the human as separated from the environment, they have adopted a deterministic approach to the people–environment relationship: the primary concern has been with understanding the effect of the environment on the behaviour of individuals (Devine-Wright and Lyons, 1997).

Mental and cognitive mapping are methods developed and employed by behaviourists and cognitive scientists. The Dictionary of Human Geography (Johnston et al., 1986, p. 432) defines mental maps in the following way: “A mental map is the spatially organised preferences, or distorted egocentric images, of place, mentally sorted by individuals and drawn upon as resources in their interpretations of spatial desirability, their organisation of spatial routines, and their decision-making transactions as satisfying agents... Mental maps are an amalgam of information and interpretation reflecting not only what an agent knows about places but also how he or she feels about them”. The definition is rather broad and loose one, including both maps in the mind and on the paper, although they are not necessarily equal.

The most frequently quoted definition for cognitive mapping is as follows: “Cognitive mapping is a process composed of a series of psychological transformations by which an individual acquires, codes, stores, recalls, and decodes information about the relative locations and attributes of phenomena in his everyday spatial environment” (Downs and Stea, 1973, pp. 9–10). A cognitive map is, thus, the product of this process at any point in time. Cognitive mapping processes encode in memory the existence of objects, their characteristics and known locations. In simple terms, a cognitive map is the encoded structure in our long-term memory of what is where (Lloyd, 1999).

The concepts mental maps and cognitive maps are often associated and have sometimes been seen to possess overlapping attributes (Tuan, 1975). However, some researchers use the latter term when referring to the cognitive structures in the mind, whereas the term mental map is dedicated to mental images and maps drawn on paper (Hayes, 1993). In this article, I prefer the concept mental map.

3. Humanistic geography: a new content for mental mapping

The development of humanistic geography in the mid-1970s brought a totally different view to the people–environment relationship. Humanistic geographers approached the environment from the basis of phenomenology and existentialism, paying attention to the subjective experience of place instead of the cognitive foundations of environmental behaviour. The sensory experiences of the environment connected with knowledge and memories are considered to form the basis of sense of place. In this way, humanistic geography stresses the active role of the human and social relations in the environmental experience (Relph, 1976; Seamon, 1979; Relph, 1989; Agnew, 1994). The idea of place character and associated sense of place have been described in the literature with various terms: Tuan (1974) uses the terms topophilia and topophobia, Relph (1976) place and placelessness, and the environmental psychologist Norberg-Schulz (1980) genius loci. These concepts point out the complexity of environmental values associated with individual experiences of the environment much more clearly than what the behaviourists did.

Humanistic geography made a clear distinction between mental maps and direct perception. Tuan (1975), for example, classified the environmental experience in the following way: schemata is a
cognitive map guiding our movement and routines; perception is sustained by the information in the environment; image is something we see even when the environmental stimuli do not appear to justify it; and finally, a mental map is a special type of image which is even less directly related to sensory experience than an image (Tuan, 1975, pp. 206–209). As follows, mental maps only play a partial role in everyday spatial behaviour (Tuan, 1975; Seamon, 1979), which is related to, e.g. topophilia or topophobia. Mental maps, though, have other functions related to geographical knowledge and behaviour. According to Tuan (1975), they prepare us to communicate spatial information, they can function as mnemonic devices, they are means to structure and store knowledge, and they serve as imaginary worlds.

In the field of humanistic geography, the aim has been to explore the subjective experiences of place and time. This has turned out to be a very challenging research task. Drawing as an act was recognised as a way of engaging bodily with historical material and making it possible to connect subjectively with the past (Harris, 1978). But drawing a map, in the way it had been introduced by the behaviourists, was regarded as an insufficient means for studying the environmental experience, since it has been understood as much wider than a perception of the environment and its representation in the mind (Shields, 1991).

4. Cultural geography: seeing the map as a representation

In the mid-1980s, a new orientation, cultural geography, started to emerge in the field of geography. In the geographical literature, some researchers seem to consider this turn a continuation of the traditions of humanistic geography, while others view it as an approach on its own. Raivo (1996, p. 20) argues that the main distinction between humanistic and cultural geography is in the way the latter highlights the meaning of culture: culture is a spatially pluralistic and dynamic process, which is an important part of social signifying systems.

Although the importance of culture had been emphasised already in the past decades, landscape as a means for studying cultural and social phenomena and processes got started at a larger scale in the 1990s. The focus has been turned to the intersubjective or collective content of the landscape and landscape representations. The landscape is perceived as a text including cultural, historical, ideological and political symbols, and the researcher is aiming at reading the landscape and analysing these symbols (Duncan and Duncan, 1988; Duncan and Ley, 1994). In this way, cultural geographers have adopted hermeneutic modes of representation, which acknowledge the role of the interpreter: the approach recognises an interpretation as a dialogue between the data and the researcher, who is embedded within a particular intellectual and institutional context (Duncan and Ley, 1994).

Following the application of cultural theories on landscape research, the early approaches to the meaning of the environment and landscape have been labelled positivistic, sociologically and culturally naive environmental image research (Jackson and Smith, 1984; Shields, 1991). The main critique has been addressed to the idea introduced by behaviourists that mental images form a causal relationship between the human and his/her environment. According to critics, they are only hypothetical constructs, whose relation to behaviour is far from being a simple, causal link. Additional critique has been addressed to the way behaviourists concentrate on the visual perception of the environment, whereas cultural geographers tend to see the landscape as a scene and mental images only as memories of these scenes. In short, mental images are conditioned by the mediation and intervention of conceptual systems, normative conditioning and socialisation, which make it possible to explore the symbolic importance of the landscape (Jackson and Smith, 1984). At its best, positivistic research on the environmental image as a form of drawn map can show the degree to which and the manner in which fancy, fantasy and wishful thinking play a role in the production of environmental images (Shields, 1991).

On the other hand, cultural geographers consider all mapping cognitive in the broadest sense: “... [mapping] involves sets of choices, omissions, uncertainties and intentions—authorship—at once critical to, yet obscured within, its final product, the map itself” (Cosgrove, 1999, p. 7). The meaning of a map arises from the map-making and the interpretation process, both of which are highly subjective. Additionally, as far as drawing is concerned, it works
through symbols and analogies (Corner, 1992). From these points of view, drawing a map should be considered a possible tool among cultural geographers as well.

5. Mental maps and their analysis

Mental mapping has traditionally been used in order to explore spatial cognition. As stated earlier in this article, the term mental map has several meanings. In this article, it is used when referring to a map of a place or a certain area (neighbourhood, city, world, etc.), drawn by free hand. A mental map might also be called a sketch map. Mental maps have primarily been used for describing places or routes, or for complementing verbal descriptions of space. Drawing a map has been based on the assumption presented by the behaviourists, that the schematisation of graphics often parallels the schematisation of the mind. In this sense, mental maps are externalisations of the mind onto paper in a complete and observable form (Mark et al., 1999); what is essential and will be drawn on the map depends on the goals of the drawer.

The disadvantages of mental mapping—in addition to the general restrictions of maps that have been presented by humanistic and cultural geographers—are related to the representation of a three-dimensional landscape in two dimensions on the one hand, and to the difficulty of the analysis on the other. Additionally, mental maps may measure more than just spatial understanding of an environment, for example, drawing or memory ability or they may suffer from a subject’s lack of drawing motivation (Mark et al., 1999). As Lilley (2000, p. 373) reminds us, drawing is a physical (including all material needed for drawing and the information that is being mapped) and creative process.

The analysis of mental maps can either concentrate on the elements out of which people mentally organise large geographic spaces (Fig. 1), or on spatial preferences (Fig. 2). The elements, which are essential physical forms, have been classified into five types: paths, edges, districts, nodes and landmarks (Lynch, 1960). The objects can be analysed either topologically (the object’s relative location) or metrically (the object’s precise location and the distance between objects).

Mental maps have also been analysed as indications of individuals’ spatial preferences, the significance of and attachment to a place. According to this view, mental maps are means of ‘externalising’ the complex aggregate of ideas, attitudes, and information, which individuals and groups of individuals possess of their cities, for example. Mental maps have been used not only for examining places at an individual level, but also places as constituting social relations. Environmental and social psychologists have been trying to define the social order of the city and the individual’s place in it with the help of maps. Attention has been paid to the choice of elements and the order in which subjects draw them, whereas the location only plays a small part in this analysis (Milgram, 1984; Melton and Hargrove, 1987; Ramadier and Moser, 1998).

Due to difficulties relating to drawing, spatial preferences have also been studied in a much simpler way, by symbol mapping (Fig. 3). In this method, subjects are asked to mark out places they consider beautiful, ugly, nice, peaceful, private, socially significant, etc. using various symbols on the map (Kyttä and Horelli, 1997; Horelli et al., 1998). The information gained by symbol mapping remains rather shallow in character and can therefore, constitute only a part of the data or methodology.

So far, the mental mapping technique has primarily been used in studies on urban environments (mostly for measuring residential desirability), the results of which are useful for planning purposes. Mental mapping has also been employed when examining the development of the world knowledge of various demographic groups, e.g. schoolchildren and ethnic minorities (Pinheiro, 1998; Halseth and Dodridge, 2000).

6. Concept mapping: a graphic system for understanding the relationship between concepts

Another type of mapping which is presented here is the concept mapping technique. It has been developed particularly among educational scientists, but has its variants within other disciplines as well. Concept mapping has also been considered a subcategory of cognitive mapping (Kearney and Bradley, 1998), and sometimes a commonly known mind mapping technique has been used as a synonym for concept mapping. Despite some differences between these techniques, their underlying idea is the same: to represent knowledge structures visually.
Fig. 1. A mental map of Los Angeles (Dorling and Fairbairn, 1997, p. 168). The analysis of the map concentrates on the observations of the physical features (paths, edges, districts, nodes and landmarks) of the city. The classification originates from the work of Lynch (1960).
The aim of a concept map is to trace the knowledge structures and mental models of humans. In other words, it is assumed that an individual’s perception and understanding of a problem or an issue can be captured in a cognitive structure that consists of interconnected sets of elements representing the implicit views of one’s own interests, concerns and tasks. In the case of concept mapping, the focus is on language: texts, sentences and descriptions are taken as depictions of an externally given world, or as realisations of underlying cognitive descriptions of the world (Carlsson, 1995; Kankkunen, 1999).

A concept map is typically a graphic representation, where nodes (point or vertices) represent concepts, and links (arcs or lines) represent the relationships between these concepts (Fig. 4). The concepts, and sometimes the links, are labelled on the concept map. The links between the concepts can be one-way, two-way or non-directional. The concepts and the links may be categorised and the map may show temporal or causal relationships between the concepts. The structure of the map displays the quality and structure of the words, concepts and semiotic signs, as well as a subject’s personality. The analysis of concept maps is both quantitative and qualitative. Frequencies of concepts and concept levels, links between concepts, etc. form the basis for the analysis. Additionally, the general impression produced by the map needs to be qualitatively analysed (Kankkunen, 1999).
Fig. 3. A symbol map of beautiful places by a group of 13-year-old schoolchildren (Kytö and Horelli, 1997, p. 4).

Huff (1990) has grouped the purposes of the cognitive (concept) mapping methods into five generic families. Although this classification has been made for strategic management research, it may also be applied to other kinds of research, which concern knowledge and cognitive processes. According to Huff (1990), mapping methods tend to fall along a continuum demanding increasing interpretative input by the researcher.

1. Maps that assess attention, association and the importance of concepts.
2. Maps that show dimensions of categories and cognitive taxonomies.
3. Maps that show influence causality and system dynamics.
4. Maps that show the structure of argument and conclusion.
5. Maps that specify schemas, frames and perceptual codes.

The concept mapping technique has been employed by educational scientists to examine the learning and knowledge structures of schoolchildren (Novak and
Fig. 4. A concept map by a 9-year-old boy on environmental conservation (Kankkunen (1999), p. 208, translated and retyped by the author). In this map, nature conservation is understood as a rather institutional and general issue, although the impact of human actions are stressed.
Goswin, 1984; Åhlberg, 1992; Kankkunen, 1999). The technique has also served as a tool for strategic management research attempting to trace mind and attention in the decision-making process (Carlsson, 1995). Concept maps have been used in environmental studies as well. Kearney and Bradley (1998), for example, used conceptual content cognitive mapping (3 CM) in order to investigate how forest stakeholders perceived appropriate forest management. The subjects, who were representatives of different interest groups, were asked to name good forest management practices and then to organise and group these concepts according to their views. After organising the concepts, the participants were asked to explain their concept arrangements and name the groups of concepts.

What are the advantages of concept mapping compared with other techniques based on linguistics and verbal description? As Lilley (2000) has noticed, mapping generates ideas and serves as a mean by which intentionality and subjectivity can be acknowledged. The concept map is a visual representation of an issue and it allows one to gain an overview of a domain of knowledge. When thinking about the visual representation of an issue, it may also allow for the development of a holistic understanding that words alone cannot convey.

7. The multifunctionality of landscape as a research challenge

The interest in the landscape as an object of research arises from its physical and visual appearance. Nowadays, the study of landscape forms and structures constitutes only a part of the landscape research arena, which is covered by different disciplines and approaches, from natural to human, social and cultural sciences. Due to different values, interests and definitions related to landscape, it has also become an academic battlefield (Jones, 1991).

The multifunctional landscape refers to the different material, mental and social processes in nature and society that take place simultaneously in the landscape and interact accordingly. Multifunctionality in landscapes means the co-existence of ecological, economic, cultural, historical and aesthetic functions (Tress and Tress, 2000, p. 154). Moreover, Haines-Young and Potschin (2000) highlight the importance of human values and the reciprocal relationship between the systems when defining the multifunctionality of the landscape. One possible way of approaching multifunctionality is through its qualities, functions and value systems. Landscape qualities refer to the ecological, aesthetical, historical or symbolic characters of the landscape. Functions are the services these characters produce, which are used by humans for different purposes (e.g. agriculture, recreation) within a certain value system. The qualities, functions and values are mutually interactive and they are influenced by economical actions.

Jones (1991) has named three main approaches for studying landscapes in general: the scientific, the applied and the human. All the three approaches produce different kinds of landscapes and for this reason, it is essential to choose an appropriate approach and research method for each purpose. When information about the physical appearance of the landscape is needed, the aim is to produce ‘objective’, ‘scientific’ information about the landscape ‘qualities’. When this information is used for planning ‘the functions’ of the landscape, the value judgements are taken into the process; the landscape is seen as a mosaic of valuable elements. Finally, the landscape might be approached purely from the human point of view. The human values are present in all the three approaches, but their role increases when transferring from the scientific to the human approach. When striving for a sustainable development of multifunctional landscapes these approaches need to be integrated.

8. Mapping—bridging human and natural sciences?

It seems that there are two distinctive ways of seeing landscapes: one, which is based on physical forms and another, which is based on the symbolic forms of landscape (Lilley, 2000). Research on the former is rooted strongly in the field of natural sciences, whereas the latter belongs to the human sciences.

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1 This approach was taken from the Conference of Multifunctional Landscapes (Roskilde, 17–22 October 2000, Workshop No. 5, Values and Assessment).
Landscape planning typically represents a situation where these approaches can come together in practice. Knowledge based on natural sciences has very often turned out to be insufficient in the planning situation. In addition to the physical character of the landscape, it is essential to realise and know human values and behaviour. Therefore, landscape as part of a signification process, needs to be studied as well. There has been some research done in the past decades, but the ‘danger’ of being driven too far away from the actual landscape has also emerged. Cultural landscape research has recently been criticised for concentrating too much on the textual interpretation of a landscape and for ignoring the material aspects of it (Olwig, 1996; Gerber, 1997; Håkli, 1999). Although culturally orientated landscape research adds essential value to landscape research, it would, however, be important to preserve the connection to the material landscape.

There have already been attempts to bridge natural and human sciences into landscape research. The iconological framework, which has been created by the art-historian Erwin Panofsky and brought into human geography and landscape research by Denis Cosgrove, represents a good example. This framework links the conventional empirical and the new interpretative and textual landscape research. Such research includes three phases. It begins with the description of the landscape morphology and the social, political and cultural history of the landscape. In the next phase, the research extends to the signification and rhetoric of the landscape. The meanings and images and their representations, which have been associated with the landscape in its social and historical context, are in focus. The research ends with the critical interpretation of meanings, images and ideologies associated with the landscape (Panofsky, 1970; Cosgrove, 1980; Raivo, 1996).

As stated earlier in this article, in the process of map-making, the physical landscape forms the basis for geographical imagination. On the other hand, as Corner (1992, p. 244) sees it, when dealing with drawing in landscape architecture, the drawing is fundamentally about making images: it might generate and transform ideas rather than represent them. Because the physical form of the landscape is present in the process of map-making—unlike writing a text—I consider drawing to represent a natural way of communicating spatial issues and values related to them. As Lilley (2000, p. 374) puts it: “... whichever view one chooses [on landscape], maps provide a way of making sense of landscape”.

As a method, mapping cannot alone build a bridge between the human and natural sciences in landscape research, but it might diminish the gap between them. With the help of mapping it may be possible, for example, to understand the differences between the meanings of landscape given by local people and the valuation of the same landscape based on natural sciences. These differences may constitute the origin of conflicts at the local level when planning and implementing decisions concerning landscape issues. Zimmerer (1999), for example, has found in his research that the topographic terms of the landscape given by local people emphasised the distinctness of landscape areas, but often differed from the topography of actual landscapes. This kind of knowledge about human perceptions of landscape gives a better understanding for current land use and possible future changes.

9. Mapping of multifunctional rural landscapes: implications for research

The rural landscape has been the object of many studies comprising all three approaches named by Jones (1991). So far, maps have been used mainly as means of visualising and interpreting the landscape morphology or as data for studying changes at landscape level. Although post-modern cartography pays more attention to the subjectivity of the map-making process (Dorling and Fairbairn, 1997), maps are still often meant to be ‘objective’ in character, describing the landscape forms and functions.

Still, there exist some examples of, or implications for, a more innovative use of maps and mapping. Maps have turned out to be useful tools when communicating knowledge about the structures and functions of a landscape and its functions with indigenous people (Toupal et al., 2001). Zimmerer (1999) has used cartographic and visual representation as a tool for exploring cultural units of agricultural landscapes in South America. (Lilley, 2000, p. 382) has suggested that geographers themselves should use drawing and mapping. He assumes that by studying landscape forms by drawing or mapping, it would be possible
to connect with the past landscape and understand the worldviews of that time. He also considers drawing a possible way of expressing one’s ‘geographical self’ and gaining an experience of place and time.

However, mental mapping has rarely been present in research on rural landscapes. It has been applied primarily to research on urban environments, but there is less experience of how mental mapping could be applied to the rural environment whose forms and functions are very different from urban ones. Drawing a map of a rural landscape might give new and interesting insights into the mapping technique itself. Mental mapping may also provide a new tool for exploring the insiders’, rural residents, views of the rural landscape, those who have often been neglected by the researchers (Halfacree, 1995, see also Duncan, 1990).

How could the mapping presented in this article be applied to multifunctional rural landscape research? What would be the added values of mapping? All three geographical orientations mentioned here, the behavioural, humanistic and cultural, define the relationship between the human and the environment, places and landscape differently. These differences need to be taken into account when using mapping in human landscape research. Each type of mapping and the level of analysis serve different kind of research purposes (Table 1).

The lowest level of analysis of a mental map could produce answers, for example, to the following questions: what elements of the rural landscape were perceived? What is the ratio between natural and human-made elements in the landscape? Which of the elements were the most memorable and would later be used as orienting landmarks? Where are the boundaries of the landscape? How do people move and use the landscape? The results from this kind of research would be useful, for example, when planning rural areas for recreational purposes.

At the second level, a landscape is understood as a subjective life world, in which sensory experiences, memory and knowledge of the landscape are interlinked. Analysis of mental maps becomes more complicated and the input of the researcher increases. Still, the maps drawn by subjects may produce information, which might be impossible to reach by any other means. At the third level, spatial mental maps could be analysed on the basis of intersubjectively and collectively shared meanings. The maps may indicate the power relations, social ties, the historical development or future prospects of an area from the subjective point of view. Concerning all the levels of mapping, it is important to realise that mapping may serve research best when combined with other methods, such as interviews, participant observation or historical research.

Concept mapping might also give new insights into landscape research. As Gerber (1997, p. 5) has pointed out, “it is central to our understanding of our relationship with what we call nature that we understand how we perceptually categorise real objects in the world as well as the implications such categories have”. The rural landscape, its qualities, functions and values include many conceptual levels and they are given

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*a The different concepts through which the landscape has been explored need to be recognised: ‘environment’, ‘place’ and ‘landscape’ (see Relph, 1989).
different meanings depending on the signifier and the context. For example, biodiversity, a dimension of the ecological character of a landscape, has turned out to be a complicated concept, which might be understood and used differently by different actors. Concept mapping might help figure out how much and in which way the views are distinct.

Finally, I would see an integrated approach to mapping as a future challenge for also studying the human dimensions of landscapes. A descriptive analysis of spatial routines and place preferences using mental mapping or symbol mapping could be combined with concept maps, for instance, on ecological processes or landscape changes of the same landscapes. The analysis, which integrates spatial and conceptual understanding of landscape and its functions, might produce interesting results.

10. Conclusions

Mapping is a very old method of constructing and conceptualising the world. Humans have prepared maps for various purposes for thousands of years. In the earlier times, maps were regarded as abstractions of the world or reality, but nowadays they are viewed as means of communication and intermediating values and power.

During the past decades, human landscape research has been based on interviews, participant observation or textual interpretation of paintings and other cultural products. Mapping has until recently been almost an unused resource. As described in this article, mapping, like every other method, has its restrictions in depicting the relationship between humans and the landscape. Still, it adds value especially to landscape research.

Although landscape research has become more and more textual, it still has its visual and spatial connections. As a visual mode of representation, it seems to me that a mental map is a natural way of expressing one’s thoughts on a landscape. Concept mapping as a way of expression differs from other modes of linguistic expression, since it includes short propositions instead of verbal descriptions or discourses. Both mental and concept mapping have their advantages and disadvantages, but they do provide an alternative way for studying human perceptions of the landscape.

Mapping techniques presented here are probably at their strongest when used in combination with other data or methodologies.

The scientific justification for mapping is found in postmodernism and in the recent development of geography. Postmodern science has challenged the modern way of understanding and explaining the world. It encourages interdisciplinarity and transdisciplinarity, as well as diversity of methodologies and innovative ways of presenting results (Best and Kellner, 1991; Benko, 1997; Owen, 1997). Additional support for mapping comes from the cultural turn of geography and its call for subjectivity in geographical writing (Cosgrove and Domosh, 1993). As it has been shown in this paper, drawing and interpreting a map are, to a great extent, subjective processes.

For these reasons, I suggest, there is a need to reconsider the value of mapping followed by large scale empirical research, which would point out its possibilities in landscape research.

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