

# THE USEFULNESS OF MENTAL MAPS FOR SOCIOLOGICAL RESEARCH OF THE CITY

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## Abstract

The paper attempts to demonstrate the potential applications of mental maps in sociological research of the city. The author presents the method and its modification. Beginning with the classical work by Kevin Lynch, he proceeds to show the elaboration of this method in the research of psychologists, social geographers and urbanists. The subsequent part of the paper discusses the possibilities of applying the method in sociological research of the city. The author demonstrates the wide range of possibilities offered by the use of mental maps. The final chapter includes a summary of the advantages and disadvantages of this method.

## Streszczenie

Tekst stanowi próbę pokazania możliwości wykorzystania map mentalnych do socjologicznych badań miasta. Autor przedstawia metodę i jej modyfikacje. Wychodzi od klasycznej pracy Kevina Lyncha, by następnie przedstawić rozwinięcie metody w badaniach psychologów, geografów społecznych i urbanistów. Kolejną część tekstu stanowi omówienie możliwości zastosowania metody w socjologicznych badaniach miasta. Autor pokazuje szerokie możliwości, które daje wykorzystanie map mentalnych. W końcowej części pokazuje zalety i wady zastosowania tej metody.

Keywords: Mental map; Legibility of the city; Imageability.

## 1. INTRODUCTION

Since the classical work entitled *The Image of the City* [24, 25] was published by Kevin Lynch in 1960, the application of mental map sketching techniques has gained worldwide popularity in studies of the city [16]. Lynch also found followers in Poland. First, the environmental psychologists (T. Tomaszewski, K. Skarżyńska, and M. Susułowska) participated in Lynch's research on children's perception of the city [23]. Then, it was also the social geographers (M. Bartnicka, H. Libura, St. Mordwa, A. Gendźwiłł, and A. Kowalczyk) who made their presence in the studies on the application of mental maps [cf. the works by these authors cited in the Bibliography].

Studies on mental maps are still conducted by environmental psychologists (for instance A. Bańka, M. Lewicka, and A. Hauziński) [cf. the works by these authors cited in the Bibliography]. However, mental maps have been less commonly used by sociologists [cf. 7, 15], who find it quite problematic to translate Lynch's analyses into a sociological analysis of urban spaces. A significant role was also played by the problems of processing the material gathered. Only after the publication of the work by Marcjanna Nózka, entitled *The Social Enclosure of Space* (Polish title: *Społeczne zamykanie (się) przestrzeni*) [30] in 2016 did this situation change. It was then that the sketching of spatial images, as proposed by Lynch, made its way into Polish sociological research on the city. The author

demonstrated how useful it could be for sociologists to analyse sketches of spatial images. Following the path traced by Nózka, this paper shall attempt to demonstrate that the method offered by Lynch may be useful not only in geography, psychology and urbanism, but also in the sociology of the city.

## 2. AROUND LYNCH

The interest in exploring images of the city started to increase in the late 1950s and early 1960s, when the behavioural trend in psychology was being superseded by cognitivism [12]. A similar phenomenon was observed in the perception of geography and the sociology of the city, where the issue of the city, as experienced by individuals or communities, started to be addressed more often. The typically objectivist research began giving way to studies revolving around the manner in which the city is perceived by its inhabitants and users. Their common objective was to gain a deeper insight into people's behaviour in the city. The purpose of this knowledge was to allow for more effective and beneficial organisation of urban space [18]. This concerned the research, dating back to the nineteenth century, on spatial images conducted by psychologists (G. Fechner, F. Galton), which got a new stimulus in the form of studies on spatial orientation by E. C. Tolman [34] and on J. Peterson's strategy of learning the surroundings by people [2]. Psychologists' attention was also drawn to the research by C. C. Trowbridge (the concept of the "imaginary map") and F.E. Lord. This issue was also undertaken by geographers and sociologists, who attached primary importance to the introduction of the distinction between objective and subjective social space by Chombarta de Lauwe [18]. This change paved the way for the emergence of the innovative work by Lynch in 1960 [18] – the work that attempted to comprehend what images are created by people in their minds, in order to better design the city.

The study inspired followers from the fields of psychology, geography, urbanism and sociology, which – in combination with the complex origin of the research on spatial images – resulted in a multitude of standpoints on the subject of the research and in a terminological mess. This was pointed out by T. R. Lee [18] as early as in the 1970s and, nearly 20 years later, Robert M. Kitchin listed 20 terms used by researchers [16]. It is not surprising that, in her work, Nózka described the term "cognitive map" as an umbrella term, because "it is referred to by the rep-

resentatives of numerous scientific disciplines who conduct research on miscellaneous issues – not only on the space occupied and marked by people, but also on geographical and environmental knowledge" [30]. This paper, however, intends to refer to the manner in which the terms have been defined by Lynch himself and by his followers.

In his book entitled *The Image of the City*, Lynch considered the visual quality of American cities. For this purpose, he made an attempt to study the mental images of the particular cities, as held by their inhabitants. Our images of a city's space, in the opinion of this American researcher, are the product of both immediate sensations and the memory of past experiences [25]. They are formed as a result of a two-way process between the observer and the object observed. What a human sees is exterior to him/her, but how s/he interprets and structures this, in turn, affects what s/he sees. Therefore, various groups may shape different images of the same outer reality [25]. Distinct images of the same space might be generated by the young and the elderly, men and women, pedestrians and motorists. In this way, images themselves do not constitute a precise model of reality, but rather its deliberate simplification which is formed by reducing, eliminating or even adding elements to reality, by fusion or distortion of interrelated and structured parts [25]. For Lynch, such an image of the city is not stable and only some of its outlines may be permanent. The image of the city is constantly changing as people acquire new experiences [25].

Lynch was not preoccupied with the individual differences in the perception of the urban space (leaving them for psychologists to study). His interests revolved around the common mental pictures (public images) carried by the city's inhabitants [25]. These are images which might be expected to appear in the interaction of a single physical reality, a common culture, and a basic physiological nature [25]. The analysis of such images encompassed three interconnected components (abstracted for the purposes of the analysis only): identity, i.e. what makes us identify a given object to distinguish it from other things; structure, which is the relation of the object to the observer and to other objects, as well as the meaning (practical or emotional) conveyed by a given object for the observer [25].

Undertaking his research on the image of the city, Lynch's attention was focused on two qualities of the urban environment, namely:

- the legibility of the city, understood as the ease with which parts of this environment may be identified

and captured into structured patterns, or simply the ease of orienting oneself in the city [25];

- the imageability, understood as the quality of the environment, which gives it a high probability of evoking a strong image (strong sensations) in any given observer, or simply the ability of the urban environment to make a powerful impression [25].

To understand the role played by environmental images in the life of a city, Lynch carried out extended research in three American cities (Boston, Los Angeles and New Jersey). One of the many research elements (besides interviews, the recognition / identification of objects on photographs, the performance of imaginary trips) [cf. 25] involved a request to sketch a rough map of the area under study, which would depict its most interesting and influencing features. Such a map would allow an individual to move around the area without any difficulty. On the basis of such material, Lynch was able to reconstruct group images of the cities under study and construct their cognitive maps. These maps are a particular type of mental maps. According to the research tradition revolving around Lynch, they could be defined as a representation of the individual elements of the urban environment, common for a given group, and the relations between them [33], [27], [25], contrary to evaluative maps, which refer to the evaluation – shared by the group – concerning the individual elements of the urban environment [27]. According to what was said before, these maps are only a certain simplification of the reality and not its exact model. Nor are they equivalent to cartographic maps, but they merely show how the members of a given community imagine their environment [cf. 25]. The concept of a map in this case is merely a metaphor rather than analogy [36]. It is also important to bear in mind that maps are not identical to the internal representation of the environment, but constitute an exteriorisation of this knowledge in the form of sketches [10].

Analysing the sketches obtained, Lynch made use of a set of five repetitive elements. They were interesting for him merely as physical objects, excluding their practical and emotional meaning and their history [18]. The key categories of the analysis include:

- paths, i.e. the streets, walkways, roads, along which we move while observing the city. Paths form the basic frame of reference to other elements. Their direction, turns, continuity and unidirectionality determine the identity of the city;
- edges, i.e. linear elements such as shores, railroads and walls, which are not used or considered as paths by the observer. They are barriers, more or

less penetrable, which close one part of the city off from another [25];

- districts, i.e. the medium-sized sections of the city. When we are in a district, we are aware of being “inside of it”, while also recognising its distinct character. Districts are usually identifiable from the inside and, when seen from the outside, they allow us to determine their interconnections with other areas. This plays a vital role in structuring the image of the city [25];
- nodes, which are treated as strategic spots in the city. They include crossroads, intersections of tram lines, squares, bus stops, underground stations, airports or railway stations. These are places which we enter and from which we set out while travelling around the city. Nodes are related to paths in terms of their crossing points and to districts in terms of places that epitomise a given area, concentrate its activity, being regarded as a symbol [25];
- landmarks, i.e. physical objects, including buildings, stores, mountains, monuments, which are an external frame of reference making it possible for us to orient ourselves in the city. Landmarks are the most easily identifiable elements that stand in sharp contrast to the surroundings [25].

After distinguishing these categories, we are provided with raw material for constructing the image of the city. It is only after considering the relations between the separate elements that the image starts to take shape. As a matter of fact, this is not an image, but a series of more or less overlapping images. Such images vary depending on the scale of the area (a quarter, a city or a metropolitan area), the season of the year, the time of day, the weather, the manner of moving around the city (the images of motorists differ from those of pedestrians), sex, age and many other factors. By analysing such images, Lynch was able to understand how the city was perceived by its inhabitants. This, in turn, was used by the author of *The image of the city* to indicate the characteristics which should be exhibited by the individual elements of the city to make it a true place, visibly organised and sharply identified [25].

Subsequent research provided no confirmation that all of the five categories are always required. This is dependent on the scale of the city and the type of the space being sketched. For example, D. Appleyard's research in a small Venezuelan town revealed mostly paths and nodes [4], while Ch. Norberg-Schulz noted that the city centre was dominated by paths, landmarks and nodes. The suburbs, on the other hand,

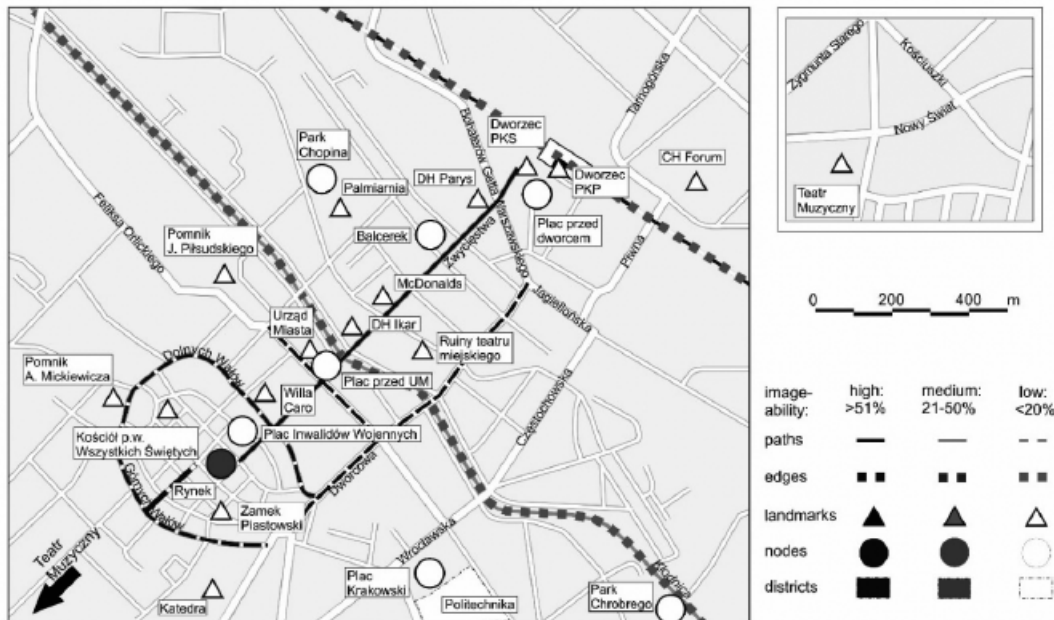


Figure 1.  
The collective map of Gliwice 2013, Source: Prepared by Piotr Dawidko on the basis of the author's research

consisted of districts and edges [2]. Irrespective of the above, Lynch has provided researchers with a set of categories which are extremely useful to study any given city.

### 3. THE PROBLEMS OF STUDYING THE PERCEPTION OF SPACE BY MEANS OF COGNITIVE MAPS

Lynch and his followers asked residents and users of a selected city to draw a sketch of the city's area. Following an analysis through data aggregation, they obtained the image of the given city [cf. Fig. 1].

The process of compiling sketches (cf. the sketch maps appended to the text) into a collective map is carried out as outlined by A. Gendźwił [8]. While exploring the space, we start from the physical aspects (objects and their interrelations). Gendźwił defines it as the real space, which may spark a dispute over the reality of spaces [8]. However, notwithstanding the terminological discussions, the starting point for the perception of space is the blocks of flats, streets or landscaping structures. In addition, there is the information from secondary sources. We do not need to be in Katowice to know that there is the "Spodek" Sports and Entertainment Arena, or in Cracow to know that it has the Sukiennice Cloth Hall in the Main Market Square. Our knowledge is also

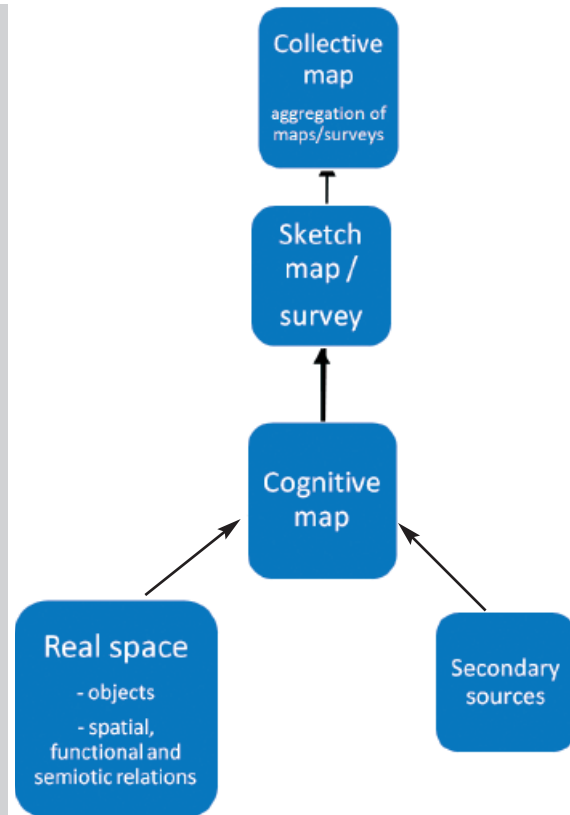


Figure 2.  
Schematic diagram of the studies on space perception.  
Prepared on the basis of Gendźwił 2006



derived from city plans and maps thanks to the popularity of such Google tools as Google Maps and Google Street View.

The tools for exteriorising fragments of cognitive maps may include requests to draw a sketch map of a city or its area (as in the Lynch's tradition) or questions for the assessment of some areas of a city, as in the tradition referring to the work by Peter Gould entitled *On mental maps* [10]. It is also possible to combine both traditions and request that the respondents not only draw sketch maps of a city but also answer the interview questions [27]. Another option is to request evaluation of the places/areas on the sketch map (e.g. by marking the highest or lowest ranking parts of the city, indicating hazardous areas, etc.). As rightly noted by Gendźwiłł, such a combination of methods makes it possible to minimise the imperfections of the individual methods.

The last stage involves the aggregation of data to create a collective map. This map is "the function of the cognitive maps of all respondents" [10]. As Gendźwiłł quite rightly points out, this raises the problem of representativeness of the community that participated in the research. Given the need to minimise "strong local effects" (we better know and evaluate our own surroundings), the issue of the research sample emerges at this point. The sample should be sufficiently large to reflect the nature of a given community (a quota sample) and to be capable of being distributed spatially, as in the author's research on Gliwice. An example of a collective map for this research is represented in Figure 1.

The aggregation of maps is also hindered, to a significant extent, by the diversity of the sketches obtained. The individual maps differ from each other. According to the typology by Appleyard, if they are dominated by linear elements and the links between them, we are dealing with sequential-type maps. If, on the other hand, they are dominated by surface elements (areas) where the links do not play any significant role, we are dealing with spatial-type maps. Each type is further divided into four subtypes [20]. A different path was followed by C. F. Ladd, who analysed sketches provided by young people and distinguished pictorial drawings presenting buildings; schematic drawings showing lines and areas (usually not interconnected); drawings resembling a map, which looked like maps but were not rich in elements, as well as real maps with landmarks [36].

#### 4. EXAMPLES OF USING MENTAL MAPS IN THE SOCIOLOGY OF THE CITY

As has already been mentioned, Polish sociologists do not make use of mental maps as often as social geographers, psychologists or urbanists do. This method, even though well-known, is not particularly favoured. This is despite the wide range of possibilities it offers. The sheer summary of the characteristics of mental maps, presented by Nózka on the basis of Hauziński, demonstrates the richness of their applications. According to the Cracow-based sociologist, mental maps:

- refer to both the physical spatial properties and the socio-cultural characteristics of a city;
- contain information on objects as well as their social and cultural attributes;
- direct human perception, decisions and spatial behaviours, as well as determine our navigation in the space;
- imitate our activities in the space and show how we use the space;
- influence the processing of the information we receive, "its (re)interpretation, omission, storage" [30].

Based on the above-mentioned remarks and referring to one's own research experience, one can distinguish several basic applications of mental maps in the sociological research of the city.

First of all, such maps are primarily used in studies on the perception of the city space. The sketches of mental maps of a given city allow us to explore the spatial images held by its inhabitants. This method is equally effective to the preferential approach (the data concerning attitudes and preferences are obtained through an interview) [17]. This was proved, for instance, by the research conducted by the author of the present paper with Krzysztof Bierwiałonek in Mikołów. It turned out that the spatial images obtained by means of mental maps were almost identical to those obtained through interviews [7]. This was nevertheless corroborated by our subsequent research [21]. A request to draw a sketch of a city is a quick and simple method to obtain data similar to those elicited during a lengthy interview which is usually boring for the respondent. Mental maps allow us to identify, for example, the most characteristic (hence the most commonly appearing in the sketches) places of the urban space as well as the frequency with which the particular spatial forms occur. We learn which edges divide

the city or which landmarks are used by the inhabitants. Important information is also conveyed by the omission of certain elements. For example, the studies on the spatial images of the Katowice city centre demonstrate a total lack of religious buildings and sites (despite the fact that they do exist in the city centre), which may be indicative of the desecralisation of this part of the urban space [21]. They are simply not relevant for the inhabitants to move around the city [see Fig. 8]. Mental maps make it possible for us to get to know both the elements that are essential for our orientation in a given city and those important for its residents [Nózka 247]. The research by Agnieszka Kilian, conducted in Chorzów on maps drawn by young people, revealed the presence of gaming arcades and a McDonald's restaurant, which then were of key importance for people in their age group. On the other hand, the elderly respondents paid no attention at all to such elements [15].

Secondly, as has been demonstrated by numerous studies using this method, the correlation of sketches with socio-demographic data may provide us with information on how a given city is viewed by men, women, the elderly and children [cf. Fig. 2; Fig. 3]. Similarly, we can use the information on the duration of residence, the financial situation, the place of residence and the way of getting around the city. For example, the research carried out by the author of the present paper in Gliwice revealed that the inhabitants of the suburban areas held completely different images of the city than their counterparts from the central regions of the city [cf. Fig. 5; Fig. 7]. The sketches of both groups include different elements. Those prepared by suburban inhabitants are more strongly oriented towards their own home location, while the residents of the central areas of the city tend to omit such places, paying more detailed attention to the city centre.

There is a vast body of literature presenting the differences in constructing mental maps depending on sex, age, the place of residence and the way of getting around the city [cf. 16; 18]. The reasons for these sex- and age-related differences were collected by Kitchin, who showed, for example, that men and women apply different cognitive strategies with regard to moving around the space, thereby creating different cognitive maps. The author also noted that a significant impact on the shaping of spatial images is exerted by the diversity of social roles performed by men and women. On the contrary, children gain their knowledge about their surroundings through education and play. Moreover, their spatial images are

influenced by a narrower range of mobility compared with adults (children usually move around in the vicinity of their home and school) [cf. 18]. The latter have more possibilities of getting around the city. The same is true for the elderly. The type of their daily activities makes their sketch maps include elements which are absent from the maps drawn by young people. The elderly attach great weight to squares, benches and health care centres [16].

Thirdly, by sketching mental maps and, above all, marking the starting point of the sketch, one can identify the *conceptual anchor point* [25, p. 102] of the inhabitants of a given city. This is the point where each map begins and around which further elements are subsequently added [cf. Fig. 6]. This demonstrates that people orient themselves in the city by making references to this element. Only later are further elements added around it. This, in turn, shows that investigating the sequence in which the individual elements are drawn on a sketch would make an interesting material for analysing spatial images.

In the case of the research conducted in the past in Mikołów, almost half of the respondents started to draw their sketches from the market square or their home location. The market square in this town was (just like the one in Gliwice) the most powerful centre of crystallisation for the locality's spatial structure [cf. Fig. 6]. As regards the home location, the motives must have been similar to those of the twelve-year-old son of Christian Norberg-Schulz, who – when requested to present his surroundings – stated, “well, I must start from my home, because it is from here that I set out to all other places” [29].

Fourthly, the sketching of mental maps may be an effective tool for delimiting the areas of a city. By requesting sketches of a city centre, we can verify which areas have been included and which not. However, it should be noted that, in this case, we may deal with two issues which are not at all identical. It can be the image of the given area or what is believed to be the given area within a community [18]. In the studies on four Silesian cities, it was the market square (if there was one in a given city) that determined the heart of the city [cf. Fig. 7]. The external boundaries of the city centre were determined by the key points in the city: the railway station, city squares and churches (the cathedrals in Katowice and Rybnik) [6].

A variant of this function might be the application of the method for determining the extent of a neighbourhood. The maps are then analysed by concentrating on the extent of the area presented on the sketches. Respondents may be requested to draw a

sketch of the nearest neighbourhood area or mark such an area on a ready-made map. An example of research based on this last variation of mapping includes the analyses by T. R. Lee, who empirically falsified the assumptions concerning the extent of C. Perry's basic unit area (not 350-400 acres as proposed by Perry, but 75-110) [18].

Fifthly, the drawing of mental maps was frequently combined with the indication of rating (expressing opinions) and emotions (preferences) on the sketches. This leads to the creation of evaluative maps. They can be used, as in the research by J. L. Nasar, to mark the most and the least pleasant areas of a city [27], the most characteristic, the most attractive, the most dangerous and the most beautiful public spaces in a city, as in the research on the public spaces of Katowice and Gliwice [5], as well as the liking for and attachment to a specific area, as in the research by M. Lewicka [19]. We then gain an insight not only into the spatial images, but also into the ratings assigned to the particular spaces and the related emotions. This provides us with an opportunity to explore the residential preferences, which is extremely important in times of increasing social mobility [12]. It is also possible to reconstruct intimate maps of a given city by marking the sketches with sites and spaces of particular importance for personal reasons (e.g. former places of residence, places of first dates, playground facilities, etc.).

Unique ideas on how to use cognitive maps and environmental assessment were offered by the students of the Institute of Sociology at the University of Silesia (Jakub Olszewski, Anna Orska), whose research on cognitive maps required the respondents from Czeladź to mark eyesore areas [cf. Fig. 11] [31].

Sixthly, the analysis may also encompass the descriptions placed on the sketches. The respondents not always, but very often, give the names of the objects, quarters and landmarks they sketch. The terminology they use does not always include the officially recognised names, but often refers to local nomenclature. An example illustrating this may be found in the research conducted by Zofia Masny in Pszczyna. The sketches collected in the research included a wide range of local names, thereby bearing witness to clear regional identity. There were examples of words from the local dialect, including: *moja chalpa* – my house, *kirof* – a cemetery, *tankszela* – a petrol station, *stary i nowy torg* – the town's market place, *stowki* – the ponds in the park [26]. As a result, the author was able to analyse the local and regional identities of the residents of Pszczyna [cf. Fig. 10].

A similar analysis may also be applied to pictograms used on sketch maps. Not only do the respondents provide local names, but they also use pictograms to facilitate the analysis of their sketches [cf. Fig. 3]. An airplane stands for an airport, just like a ship stands for a harbour and a cross for a cemetery. Similarly, Marcin Lisak noticed that the respondents in his Irish research quite willingly used pictograms to mark public utility places [21]. Such an analysis of pictograms could be an interesting complement to the sociological analysis of mental maps. However, it would require further refining of the methodology.

Seventhly, as demonstrated by the highly fascinating research of Nózka, mental maps can be used for examining the issue of social exclusion. Her ingenious analysis made it possible to show the differences amongst spatial images depending on the degree of social exclusion. She highlighted the relations of residents living in the enclaves of poverty with their surrounding space. Moreover, she created an innovative typology of sketch maps (a network of roads with objects; a network of roads without objects; domocentric arrangements; objects without roads; fragmentary arrangements), thereby being able to show *the relations between the subjective sense of exclusion and the manner of existing in the space and its schematisation* [30]. This paved an interesting way for the research on both spatial images and exclusion [30].

Eighthly, the research can be used to analyse the degree of adaptation to the place of residence. This application becomes clear after examining the results of the research on Polish immigrants in Dublin. Even though Lisak does not analyse the sketches from this perspective [21], the material presented encourages a more insightful examination, taking into account the level of adaptation to the surroundings. It may be assumed that the length of residence and the degree of adaptation to the city's community play a significant part in this case. However, such an assumption would require separate studies to be verified.

It is possible to indicate further similar applications. The latest research by Nózka demonstrates that the method has a huge potential and is worth using to obtain interesting results. However, this is not happening and sociologists, unlike geographers, psychologists and urbanists, are very chary of using the mental map sketching techniques. This has nothing to do with the knowledge of the works by Lynch (*The Image of the City* has been finally translated into Polish) [24, 25] and his followers, but rather with a certain balance of advantages and limitations associated with this method.

## 5. THE ADVANTAGES AND DISADVANTAGES OF USING THE MENTAL MAP METHOD BY SOCIOLOGISTS

Although this method offers a series of significant advantages, it is not free of flaws. Let us now review both sides. First and foremost, the sketching of mental maps gives us an insight into the spatial images of the city inhabitants and users. Moreover, the method allows us to specify the elements that constitute the collective images of a given space and their mutual relations. Such possibilities are not offered by the traditional preferential methods (such as surveys or interviews). Its indisputable advantage is also the active role of the respondent. We avoid suggesting any answers to questions. The sketches are created in a spontaneous manner, with the respondents being totally free to choose which elements should be drawn and which not. Furthermore, it is possible to combine mental maps with other research methods and techniques. Particularly good results are brought (as experienced by the author himself) when we combine mental maps with free-form interviews or even structured interviews. The subjects of the research find it interesting to draw sketch maps as a departure from the sometimes tedious questioning. Supplementing the instructions with requests to indicate ratings on their sketches makes it possible to present emotional ties with the various elements of the environment. Of great importance is also the possibility for graphically representing the research results on a city map. Mental maps are also perfectly suitable for researching children [cf. Fig. 3]. In the case of children, it is not always possible to apply the conventional research techniques. However, children are keen to draw sketches of how they see their city [cf. 23].

Unfortunately, this method also has important drawbacks. First and foremost, no unified methodology has been developed to conduct the research based on mental maps. This concerns such research in general and sociology in particular. Sociology has not developed such a sophisticated methodology for analysing maps as psychology and social geography have. Even this short paper has shown various approaches to the research based on sketches of the space. A coherent methodology for processing the research results has not been developed either [36]. The methods for processing the results vary across different authors. Further use of this method will require sociologists to review and specify the manner in which they gather and analyse the research material. An important step in this direction is the work by Nózka [30], which has

already been mentioned a few times.

Lynch's method was also criticised on the grounds that a hand-drawn sketch "requires a certain level of education, training and ability" [36]. Not everyone is competent enough to present an elaborate sketch map. Some respondents sidestepped this task by presenting a very general drawing of their city (e.g. limited to an indication of the market square and their own home location). This is also related to the tendency for the respondents to shrink from drawing a sketch. As experienced by the author, many participants try to avoid the drawing activity (this is true for adults; children are keen to draw maps). This is when a new risk emerges. While encouraging respondents to draw their sketches, the interviewer provides them with additional instructions that may impact the final sketch map. This is because the research is very susceptible to the occurrence of the so-called "interviewer effect", especially when carried out by incompetent and inexperienced interviewers (this was experienced by the author while he was conducting his research in Gliwice). The problem can be avoided by providing a precise instruction on how to draw the sketch. However, it must be borne in mind that the sheer nature of the instruction has a considerable impact on the sketch being drawn. Researching the same city, we may obtain different maps, depending on how sophisticated and detailed the instructions are. Therefore, any potential instructions require a high level of precision, just like the instructions for interviewers.

The criticism also related to the fact that both the sketching activity and the subsequent analysis of the sketches are quite time-consuming. Even if the research based on mental maps is relatively quick to conduct (despite the objections raised by critics), the subsequent data analysis is a process that requires a considerable amount of time. One can create map typologies (Nózka), categorise and encode the elements on the sketches (Bierwiałonek, Nawrocki), apply the sketches on tracing paper and photocopy them (it is then possible to determine the reach of a given area) or supplement the analysis with an examination of pictograms, descriptions, etc.

The objections also concerned the above-mentioned diversity of sketches [cf. 3-11]. Various types of maps make the subsequent analysis more difficult and generate methodological doubts. It is difficult to make a joint analysis of a sketch presenting trees in a park or a family home and sketches that present detailed spatial relations.

There is also criticism concerning the sheer essence of the method. Some critics complain that it high-



lights too many of visual impression elements at the expense of auditory and olfactory impressions [36]. This is, however, the price paid for choosing one method over another. After all, the analysis of a city's image may be supplemented by the analysis of the urban audiosphere [22] or by the construction of aromatic city maps [32].

## 6. THE PUBLIC SPACE OF GLIWICE – AN EXAMPLE OF THE APPLICATION OF THE METHOD

The research was carried out in July 2013 as part of a training programme for the sociology students of the University of Silesia. The request to draw a sketch map was interwoven with interviews concerning the identity of the city and its inhabitants. The research encompassed 390 inhabitants of Gliwice, who were selected on the basis of sex, age, education and the district of residence. Maps were drawn by 262 individuals (67.2% of all the respondents), which is close to the value obtained in the research conducted in 2010 in the same city (70.4%). The respondents were requested to draw a sketch of the city as they see it from their own perspective. They were instructed that they were not expected to draw an exact plan, but merely a sketch of Gliwice with indication of some of the most important, in their opinion, locations for the city. Unfortunately, the preparation of the interviews translated into the quality of the material gathered. The fact that the research was conducted by trainees, rather than adequately selected and well-trained interviewers, was reflected in the quality of the material gathered. A certain number of the sketches were excluded from further analysis. One respondent failed to handle the task and, in the case of three others, three or fewer maps were prepared (the sketches constituted 20% or less of the overall number of interviews conducted). The analysis of the maps drawn also showed the presence of the interviewer effect. In the case of a few individuals, the majority of the maps were of the same type and were prepared in a similar manner. The students found it far more difficult to execute the sketches than to conduct standard interviews. This example illustrates the importance of adequate selection and proper training of the interviewers conducting such research.

The research also demonstrated that the issue of spatial sample distribution requires thorough consideration. This is particularly true for cities whose shape has been affected by the course of agglomeration processes. Due care was taken to distribute the

research sample in proportion to the number in all the districts of the city. It turned out that in the suburban areas, which were formerly autonomous villages or even towns (e.g. Łabędy, Wilcze Gardło, Bojków), most of the inhabitants did not draw the inner city of Gliwice and confined themselves only to their own district. This trend might be demonstrated in Łabędy, where only 27.2% of the inhabitants in this district referred to the inner city of Gliwice in their sketches. Therefore, it should come as no surprise that, in a city like Gliwice, only 34.4% of the inhabitants confined themselves only to the inner city in their sketches. In the case of Gliwice, the instruction to draw a city from one's own perspective caused the majority of drawings to include the areas of one's place of residence, supplemented by inner city areas. The lower quality of the material gathered when compared to the previous research on Gliwice from 2010 [5] significantly affected the frequency in which the particular elements emerged on the maps drawn by the inhabitants of Gliwice. Nevertheless, the main conclusions from the studies on public spaces in Gliwice [5] were confirmed.

Above all, the spatial image of Gliwice continues to be based on the urban layout of the market square, the Zwycięstwa Street, the railway (PKP) station (occasionally with spatial extension in the form of the Forum shopping mall). When a sketch depicts the city centre, the most common element is the market square, appearing in 55.0% of the maps (in 2010 – 83.5%), the Zwycięstwa Street in 24.4%, the railway (PKP) station (11.7%) and the railway square (8.4%). This has corroborated the claim by K. Bierwiazzonek who years ago wrote that this space clearly identifies the most important and imageable urban axis [5]. At the same time, the market square is the most significant area for the crystallisation of spatial images. Nearly one fourth of the inhabitants (24.5%) began drawing their sketches from this very place, while only 4.4% from their place of residence, while 5.8% from the city's contours.

However, the dominant role of parks was not confirmed amongst the surface elements. The Chopin Park once again demonstrated the highest imageability (11.8%), but it was marked on a considerably lower number of sketches than in 2010 (30.1%). The Bolesław Chrobry Park appeared only on 3.1% of the sketches (5.9% in 2010). On the other hand, the Krakowski Square was marked on 7.3% of the maps (14.8% in 2010).

As in 2010, it was very uncommon for the inhabitants to mark edges. The railway tracks appeared in mere-

ly 4.6% of the cases (8.9% in 2010), while the Kłodnica River – in 3.4% (14.1%).

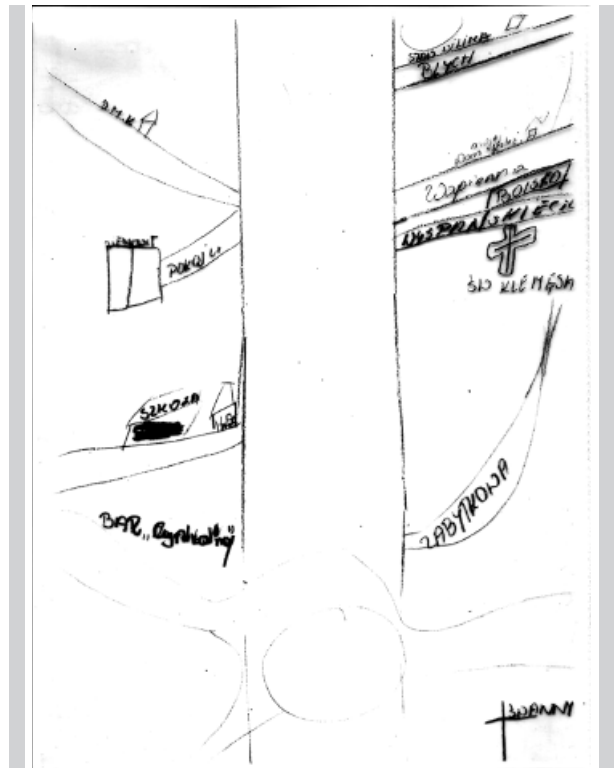
As far as the Lynch's concept of paths is concerned, besides the Zwycięstwa Street, it is worth mentioning only the Dworcowa Street 7.3% (23.4% in 2010) and the Dolnych Wałów Street (9.0% in 2010). On the other hand, the most commonly appearing landmarks included: the Palm House 11.1% (15.4% in 2010) and the Cathedral 8.0% (15.6% in 2010). The maps were markedly less common (6.9%) to feature the Forum shopping mall (32.8% in 2010).

The research, conducted at the interval of 3 years, brought slightly different results. Despite the same instructions, the overrepresentation of individuals from suburban areas and the lower level of interviewers' preparation resulted in different results. The most common categories continued to be sketched, but they appeared on the maps considerably less frequently. This shows how important it is to properly develop the research methodology, adequately create the research sample as well as suitably train and control the research team. The author's experiences demonstrate that the application of the mental map technique may be beneficial for the sociologist, provided however that the research methodology is properly developed.

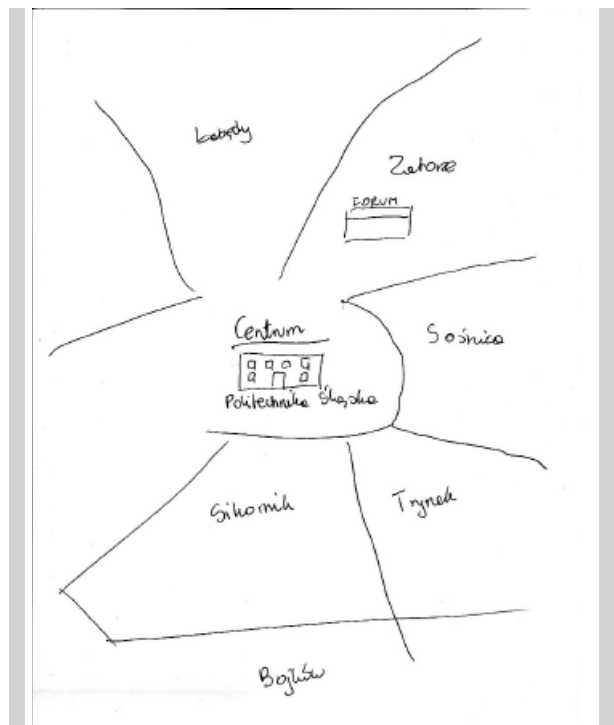
The present paper presents examples of how mental maps can be applied in sociological research of the city. The author of the paper mentions some of the more significant advantages and disadvantages of the method. It seems that its many advantages are offset by its equally numerous disadvantages. However, it is too early to make any predictions about the usefulness of the mental map method for sociological research of the city. The question whether such maps are worth using for urban analyses should be answered by further studies and specifications of the research methodology. In the case of Polish sociology, significant progress in the application of this method has been reported thanks to the work by Nózka [30].



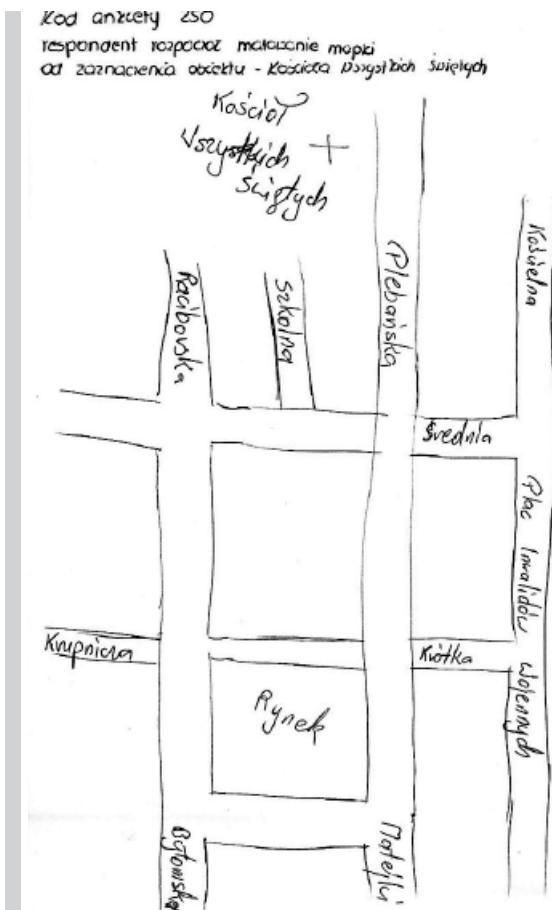
**Figure 3.**  
**Ledziny 2001, a child**



**Figure 4.**  
**Łęziny 2001, an adult**



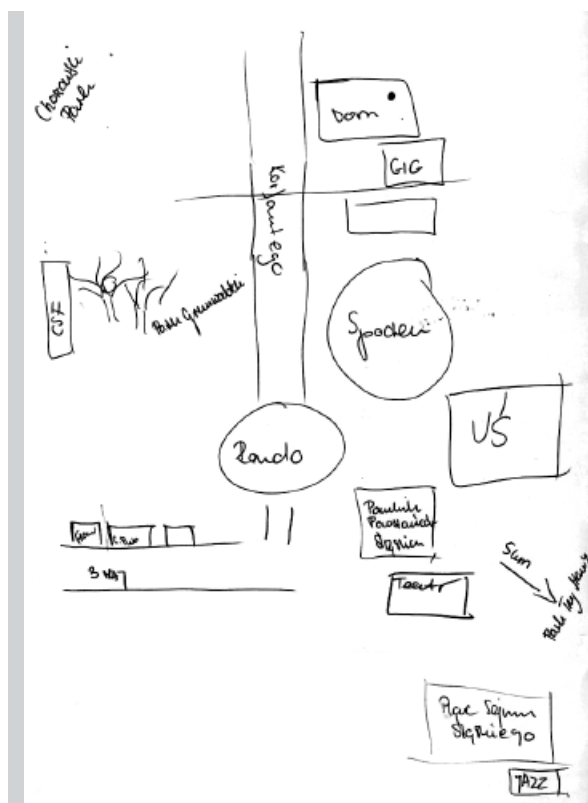
**Figure 5.**  
**Gliwice 2013, a woman, aged 18–35**



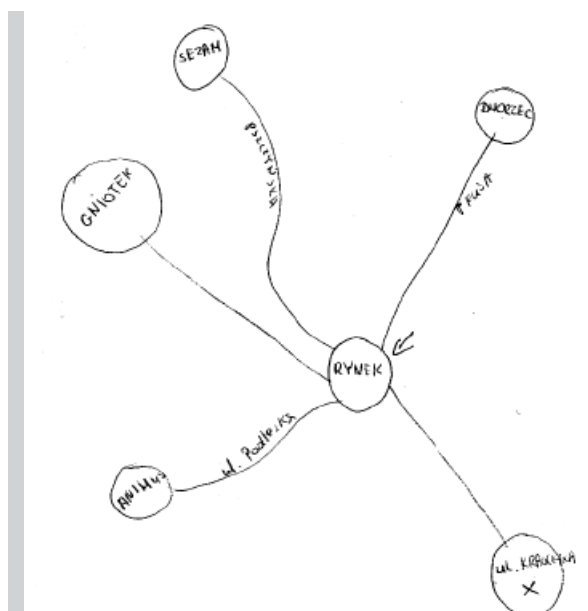
**Figure 6.**  
Gliwice 2013, a man, aged 51–65. The respondent began drawing the map by marking the object – the All Saints' Church (in Polish: Kościół Wszystkich Świętych)



**Figure 7.**  
**Gliwice 2013, a man, aged 36–50**



**Figure 8.**  
**Katowice 2010, a woman, aged 18–35**



**Figure 9.**  
**Mikołów 2001, a woman, aged 23 [7]**



Figure 10.  
Pszczyna 2008, research by Zofia Masny [26]

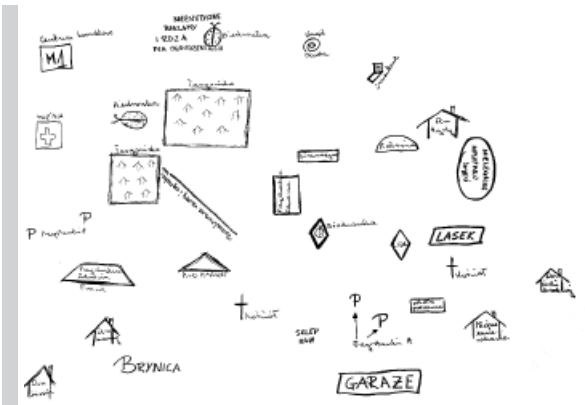


Figure 11.  
Czeladź-Piaski, research by Anna Orska, Jakub Olszewski [31]

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