Schizoanalytical Digital Modelling for Urban Design

Incorporating the indexed keys methodology into the anthropological analyses of urban structures

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Abstract. Schizoanalytical digital modelling serves description of processes occurring in urban settings. Schizoanalysis serves to ‘meta-model’ the everyday world around us, where ‘meta’ means inclusion of different perspectives. The paper formulates few hypotheses concerning the relation between the crowd of people representing a specific culture and the urban settings, which constitute their habitus. The methodology of analysis of urban structure is proposed, which is based on the urban closures cross-sections analysis with the use of Line of Site method (LOSs), as complimentary to the Space Syntax methodology of pedestrian simulation and analysis of field of sight, based on isovists. The paper presents the results of the descriptive analysis of the former Jewish district in Lodz, research on which is to be developed with the methodology proposed.

Keywords. Anthropology; schizoanalyses; geomatics; urban design; urban morphology.

INTRODUCTION

Definition
Schizoanalytical digital modelling serves to describe processes occurring in urban settings (McGrath 2008, p.198). Guattari defines the analytical aim of schizoanalysis as a shift away from prescribed ways of thinking within disciplinary structures of representation, by instead ‘fashioning new coordinates for reading and for “bringing to life” hitherto unknown representations and propositions’ (Guattari 1998, p.433, after McGrath 2008, p 201). “Each stratum, or articulation, consists of coded milieus and form substances. Forms and substance, codes and milieus are not really distinct. They are the abstract components of every articulation.” (Deleuze and Guattari, 1987, p.502). Schizoanalysis serves to ‘meta-model’ the everyday world around us, where ‘meta’ means inclusion of different perspectives (Guattari 1989).

The human presence in social spaces may be divided into flows and concentrations: flows are connected with movement/traffic and are related to space, following the definition by Yi Fu Tuan (2001). Concentrations enable contact and communication processes. They are static rather than dynamic, thus place related. Both types are closely interrelated, they inseparably interpenetrate each other. Whenever the human flow stops for a moment concentration occurs, though interrelations require more comfortable conditions to take place, among others: time and spatial arrangement. The development of
methodology, which may allow for understanding how urban spaces are formed, through interaction of various forces and flows, acting at different intensities and speeds, requires incorporating research of several specific disciplines. In terms of the theory formulated by Lynch (1960) flows may be treated as paths and concentrations as nodes.

**Anthropological concept of situation.**

In anthropology situation is defined as a theatre of human activities (Perinbanayagam 1974). Goffman (1963, p.18) refers to a situation as to “the full spatial environment anywhere within which an entering person becomes a member of the gathering that is (or does then become) present”. Anthropologists developed elaborated theory on ways how a site is converted into a meaningful ‘place’; by inscribing human activities into the surroundings. The relationship between people and sites encompasses both: attaching meaning to space and “recognition and cultural elaboration of perceived properties of environments in mutually constituting ways through narrative and praxis” (Lawrence and Low, 2009, p. 14). Schumacher (2011) states that the role of architecture is to frame social communication and “to continuously adapt and re-order society via contributing to the continuous provision and innovation of the built environment as a framing system of organised and articulated spatial relations” (Schumacher 2011, p. 414). Thomas, who introduced the concept of situation in the 1920s, defined it as a “constellation of the factors determining the behaviour” (Thomas 1937, p.8 after Schumacher 2011, p.420). The morphological approach (Panarais et al., 2009) refers this concept to the urban structure introducing the not concept of spatial logic of space. A comprehensive set of features allowing for making characteristics of physical structures, including the culture related ones, was developed, among others, by Rapoport (1990, pp.106-107).

**Perception of city scapes**

Direct contact with the environment allows for observation and validation. The development of theories referring to urban perception started with Lynch (1960, 1994) and Debord (1950). The theoretical body for the studies is derived from Lynch’s theory of perception (1960), Rodwin and Lynch (1991) distinguish two types of urban structures: spaces of flows and by the British Picturesque School (Cullen 2008), concentrating on elements of urban scapes presented in detailed scale, allowed to enrich this methodology. Currently, concentration on the human perception of cityscape became a common approach along with the development of postmodernism and postFordism and it is also often connected with the psycho-geographical examinations of the urban settings.

The perception and evaluation of urban scapes express the spirit of the particular era and remain a subject of the beauty canons (Lotthian 1999). During the 20th century, this process occurred mostly in the case of modernist transformations of downtown areas, where former structures, particularly from the 19th century – perceived as obsolete – were replaced. The changes and differences in beauty canons follow the mental interpretation of perceived images (Adorno 2011), (Strzemiński 1974). The important issue, which influences the perception of city structures, is the cultural background of citizens and designers. Proxemics, constituting a part of the anthropological approach, relates the human environment to the behavioural patterns proper for distinguished cultures. The differences in personal distances influence both the perception of space and its production (Hall 1966; 2009).

**CASE STUDY – FORMER LODZ JEWISH DISTRICT**

The paper seeks to develop the methodology for the analyses of the former Jewish district in Lodz. In the 19th century the district served as a habitat of the multiethnic society, in which Jews constituted a majority (Hanzl 2011; Hanzl 2012a). The transformation processes, which started during the World War II and continued during the socialism period, prove the presence of utterly different approaches, as a result of both civilisation changes and cultural differences. The numerous studies concerning the
culture of Jewish emigrants from the areas of Eastern Europe deal with the characteristic features of the life in small towns, villages and districts of bigger cities defining them under the same notion of ‘the shtetl’ (Zborowski and Herzog, 1962; Ertel 2011; Wirth 1962).

**Former analyses of urban morphology of Lodz**

The analyses of urban morphology in Poland was based so far on the methodology of MRG Conzen and was developed for Lodz by Koter (among others: 1979, 1984). Conzenian research (2004), developed further by, e.g., Whitehand et al. (2000), concentrated on examination of the urban structure mostly in its plan aspects, against the economic and social background, looking for relations between the city, its inhabitants and the dynamics of city construction (Vernez Moudon 1997, p.4). The lack of analyses of the physical form pointed by Bandini (2000, p.133) doesn’t allow for examination of the appearance of urban scapes, which constitutes an element of culture. The character of constructions in the given area was characterised in Hanzl (in press).

The descriptions, frequent in literature, indicate at the presence of narrow, “circulating” back-streets of the downtown part of Bałuty district and of the Old City as at an example of spontaneous development (Friedman 1935, p.94). An attempt has been made to define a certain set of features proper to the area, describing its morphological structure (Hanzl 2011, 2011a), which is repeated in most Polish towns and neighbourhoods populated by Jews (Dylewski 2003; Hanzl in press a).

![Figure 1](non-existing appearance of the central part of the old Jewish district contrasted with the contemporary figure-ground map:
1. buildings in 1939,
2. buildings in 2010,
3. parcels in 1939,
4. parcels in 2010,
5. lines of frontages – 1939,
6. distant landmarks – 1939,
7. landmarks – 1939,
8. locations of different activities – 1939.)
fers mainly to the areas of the Old Town and of the central part of Nowe Bałuty. Some features proper for Jewish concentration concerned also the area of Nowe Miasto, established in 1821-1823 by Rajmund Rembieliński, though the level of assimilation processes of the society living there, the mixing of different groups and the character of spaces represented different stages of urbanisation processes (Wirth 1938).

The juxtaposition of various spatial traits within the neighbouring areas as well as the comparison of planned transformations allow to distinguish features proper to each period and some of the cultural differences. The analyses of chosen places within the district – the index keys, basing, among others, on archive photographs, provide important data on how spaces were used; the characteristic of relations between the types of activities and forms of spaces allows to formulate the conclusions indicating at a culture-specific character of the urban spaces. The basic assumptions to the description of the character of space may be defined basing on the analyses of the main elements of urban structure as defined by Lynch: landmarks, paths, districts, nodes and edges [Fig.1]. The characteristics of public spaces of streets, alleys, nooks and squares – paths and nodes, according to Lynch’s terminology, where the most important flows and encounters take place, may provide the basics for the description of the situation-dependent context.

**METHODOLOGY**

*Theory of seeing – index keys concept*

Like in paintings of Van Gogh, the seeing is concentrated around few key points, which define the way, how a scene is perceived (Strzemiński 1974), the analyses should provide the observation of processes: flows and forces, and concentrate on their key points. The situations, which are the most important for definition of cultural character, thus the moments of human interactions, particularly attract the researcher attention (Hall 2009). The clue activities important for the specific cultures remain often unnoticeable for foreigners, that is the reason why photographs and pictures effectuated by native observers are indispensable. The methodology of key points, analogue to the anthropological method of making photographs by native observers, who are able to notice the clue activities important for their cultures and often unnoticeable for foreigners, allows for observation of socially meaningful activities, responsible for cultural specific environments’ formation.

The implementation of the key points’ methodology as an addendum to the method of analysing the urban scapes with the use of isovists proposed by Benedikt (1979) assumes the choice of the most obvious perspectives when observing the environment, which for urban spaces means choosing these view axes, which provide cross-sections perpendicular to the main axe of a given path. The analyses of the cross-section and of the silhouettes may, e.g. use the highly efficient methodology proposed by Gal, Doytsher (2012), which allows to extract the Line of Sight (LOS) of groups of buildings.

The proposed methodology of path analysis assumes examination of the cross-sections, which may obviously change along the path providing the street silhouette. The points of change of cross-sections as well as the points of change of axe direction – as in the axial analyses developed as part of Space Syntax methodology (Hillier and Hanson, 2003; Hillier 2007) provide an interesting insight defining the space. Their distribution along the path axe as well as the range of changes (e.g. of height) shows the variety of streetscape, allows to identify the width of frontages, etc. The regularity of key points distribution confirms the presence of rhythms in urban space. Their clusters evidence the presence of nodes.

The proposed methodology provides additional analysis of public/social spaces in their most important/key points and may be complimentary to the Space Syntax – a method of examination of physical spaces provided by Hillier and Hanson (2003) and further developed by Hillier (2007) and researchers all over the world. The basis of the method is derived from the traditionally used...
method of description of urban closures (Jacobs 1995). The method itself answers to some points of the critics of the Space Syntax methodology as provided by Ratti (2004), among others tries to answer the question of geometrical description of buildings as forming urban settings, including their size, shape and distribution. It also remains complementary to the method of space partitioning and recording properties of the isovist fields associated with paths proposed by Batty (2001). The depth of space, as defined by Benedikt (1979) may be analysed as an additional resource.

**Crowd assessment**

The analysis of the key points distribution associated with paths should also follow the methodology. The thesis is made that there is an observable correlation of the distribution of key points in the urban settings and the distribution of people, who are everyday users of the given settings, forming a pedestrian flow. Thus the proxemics distances as described by Hall (1966; 2009) find their reflection in the streets and squares walls’ shape. According to Strzęmiński (1974) artistic creation, including the architectural one, uses the apparatus of perception which is being developed when watching people’s distribution, and it is where he looks for the explanation of this adjustment. Groups of people forming a crowd are usually described as clustered, spaced or scattered (Fridman, Kaminka, 2007). The interpersonal distances are related to the cultural conditions of a given community. The hypothesis is made that the consistency of urban pattern discussed by Hillier (2009) are a consequence of the rules of crowd behaviour constituting part of a given culture.

The use of linguistic variables, as referred by fuzzy logic (Berthold 2007, p.323), to define the features, which may be described as belonging to a given population allows for analysis of lay notions. In the analysis of flow systems the clear cut edges between the flows – paths of movement - and nodes - places of encounters - are usually not applicable. Thus the description of the schizoanalytical process may use the fuzzy logic methodology. The features distribution may also use the GIS continuous data analyses.

**THE PRELIMINARY RESULTS OF ANALYSES**

**Shape of public spaces, sequential analysis - General features**

The examination of the character of public spaces as they are perceived by observers, in the case of scapes, which do not exist in their original form, includes mainly the analysis of archival photographs.
The subject of analysis is first the shape of the public realm itself – in 2D plan, cross-section and street silhouette. Moreover the sequences of views in time and character of buildings itself should be analysed. The essential features of the outdoor space, characteristic for the given area refer to the issues of scale and dimensions. The narrowness of streets and presence of numerous slight turns and directional differentiation, providing the notion of concavity, thus closing the perspective and assuring perceived and felt closure, are factors favouring direct physical interaction. Gehl (2009) indicates at small dimensions of spaces as favourable for establishing relations. The irregularity of enclosures of streets, their broken line, the apparent lack of precise form, which enlarged the amount of border space, where people stop more willingly than in the centre of an open space, facilitates transactions, presentations of goods, etc. The abundance of such spaces enabled the location of numerous outdoor, commercial furniture: stalls, kiosks, stands and presentations encouraging buying. Furthermore, purchase was encouraged by the merchants’ activity; by the way, not all methods were upright. The aforementioned behaviours are also the most successful in narrow and intimate places; even in the comparably wide streets such as Zgierska or Łagiewnicka the pavements remained narrow. Whyte (2009) defines the set of features of outdoor space favouring contacts and fostering relations pointing at the location inside of the human flow. Gehl (2009, p.150) underlines the role of the corrugation of the edge of space (through the presence of elements of urban equipment and the shape of walls themselves) as a feature important for enhancing communal life. In the case of the discussed area the tightness of some places, the complication of wall shapes, the apparent chaos could hinder concentration and easiness of perception by persons from outside, which could in turn facilitate transactions profitable for sellers (not necessarily for buyers). Attracting passers-by, was fostered by the presence of numerous small size elements in the outdoor space, providing sham shelter – Cullen (2008, pp.103-105) describes this phenomena using the example of a street „cross“, the main function of which was to stop pedestrians. Here such role, less formal, was fulfilled by outhouses and stalls. Whyte (2009) confirms the observation concerning the attractiveness of elements freely distributed in the outdoor space.

**The ubiquity of commerce**

The basic character of the area of concern may be defined as the ubiquity of commerce. The space of commerce was not restricted to the main square, it was present in the neighbouring streets and passageways. The assortment of goods covered all branches. Frequent protrusions of buildings, especially of commercial and service use (gastronomy, etc) additionally influenced the presence of service in the public sphere, and thus improved the effectiveness of sale. Very rational management of space, lack of space without prescribed use, frequent overlapping and synergy of different uses of the same space completed the above picture. Limited scale both of streets and squares, which on the one hand facilitated the development of commerce, and on the other was related to the smaller interpersonal distances, than in case of other nations. Jews often choose the settlement location in the direct proximity of commercial places. After settling, they usually redeveloped their environment introducing enhancements with regard to the requirements of commerce.

**Analyses of the sociometric layout**

The physical structures, in the Jewish period, due to the breaks in the lines of frontages surrounding most of the blocks, allowed for enriching of the initial network of streets with numerous passages, small squares, nooks, completing the official sociometric layout with the possibility of informal circulation in the area. The actual network of passages was thus richer than the layout of streets, laid out as part of the initial parcellation. Hillier and Hanson (2003, pp.53-66) indicate at the relation between the characteristic of a given society and the sociometric layout, which is created by the group.
The dense network of curvy streets, alleys, nooks, passages and pedestrian ways, including informal passages through private properties is a feature characteristic for the whole of the discussed area – also in the part of Nowe Miasto inhabited by Jews the number of such junctions is higher than elsewhere. The density of the street network is a feature, which Jacobs (1992) qualifies as facilitating the development of all kinds of services, especially commerce in the ground floor of buildings, as it stimulates pedestrian movement. Most of the connections remained mostly pedestrian, which fostered the presentation of goods and making deals.

**Issues related to proxemics**
The proxemics approach, presented by Hall (2009) and his successors, examines the relation of spatial patterns of usage of space in different cultures with the material environment. The differences between morphological structures representing various cultures are particularly apparent in cities, which like Lodz had become a melting pot of many cultures. Hall (2009) identifies direct relationships between interpersonal distances and other characteristics specific to individuals and communities and the way they shape their own physical environment. Hillier and Hanson (2003, p.27) refer to the usage of space and the patterns of behaviour appropriate for different communities and ethnic groups as the determinants of the final shape of urban structures. According to Hillier (2009) city is seen as a system of visual distances, which is strongly influenced both by perception and personal distances.

In nomadic tribes, the members of which are accustomed to residing in small spaces, social distances are usually smaller than in other groups. Assessment based on the descriptions of the crowd in literature, e.g.: Singer (2010) or photos of the Ashkenazi Jewish population, which once used to live in Lodz, correspond to that characteristic. The typical for the most of former Jewish towns and districts limited scale of outdoor spaces, narrowness of the passages and nooks, often even narrowed because of introduction of additional trade facilities also fit into this characteristics.

The analyses of crowd basing on the methodology proposed by Siddiqui and Gwynne (2012), and with the use of the archive photographs, allow to distinguish apparent clusters of people, who grouped also when moving. Thus the narrowness of sidewalks. The network analysis of pedestrians allows to characterise crowd as clustered.

**Perception as a factor influencing the creation of space**
Strzemieński (1974) pointed at the evolution of the visual awareness along with the development of civilisation. The visual awareness was transformed together with the changes of the socio-cultural settings. He noticed the result of economic and technical factors as well as the social structure proper for the given group of people, in the defined historical context. The notion of visual awareness, understood as the “cooperation of seeing and thinking” emphasises the role of cognitive absorption of perceived visual stimuli. Strzemieński (1974) identifies two ways of development of the visual awareness. In the rural cultures, it is the observation of the interior of an object, which finds its expression in the studies of nature. The second form was a silhouette vision, which developed from the primitive contour observation in economies based on hunting and breeding animals, that is in tribes accustomed to vast open spaces. The derivative of the silhouette vision was the perspective of simple parallel projection, and, in the further stage, the development of rhythm, including architectural rhythmisation, as a consequence of inclusion of the afterimage phenomena, natural for the perception processes taking place in vast open spaces. Another form of seeing, which was particularly apparent in communities, whose main occupation was commerce was seeing concentrated on ware attributes, with the emphasis on the texture and weight of objects, usually devoid of larger perspective. The preserved iconography, mainly paintings by Jewish artists contemporary to
the development of the ‘shtetl’ culture, confirms the assumption on their belonging to this group. The shape of urban settings analysed above also confirms the thesis about concentration on the content rather than on external appearance of activities and environment itself.

Adorno (2011, p.5) points at the role of artworks as medium reflecting the unconscious aspects of culture: “Artworks are afterimages of empirical life insofar as they help the latter to what is denied them outside their own sphere and thereby free it from that to which they are condemned by reified external experience.” The same refers to the urban settings, which perceived by a group of users answer their needs, including the aesthetic criteria.

CONCLUSIONS
Lévi-Strauss (1954, pp.137-8) describes the city as “the most complex of human inventions, (...) at the confluence of nature and artefact”. The subject of investigations are the tangible results of social and economic forces, the outcomes of ideas and intentions expressed in actions, which are themselves governed by cultural traditions (Vernez-Moudon 1997, p.3). Experiencing of culture may be effectuated via examination of its influence on the physical form of the city: spaces of flows and built-up places.

The everyday uses of space constitute the most important part of activities analysed (Lawrence, Low 1999). Hillier (2009) defines the term of ‘spatial emergence’ as “the network of space that links the buildings together into a single system acquires emergent structure from the ways in which objects are placed and shaped within it”. An important factor influencing the creation of social spaces is the way, they are perceived. The seeing awareness is an unconscious mental process, which allows for filtering out of what is seen including the culture-related setting. The perception of images and the beauty canons remain culture specific, which refers also to the urban settings, directly influencing their shape. At the same time pedestrian behaviour remains influenced both by behaviour of other people – thus analysis of crowd behaviour is necessary as well as the analysis of the perceived space in the field under observation. In this the analysis of LOS (Light of Sight), which may refer to the cross-section studies, seems the most important. The paper proposes the methodology for analysis based on LOS studies and crowd behaviour assessment and provides some initial observation confirming the influence of culture and everyday usage of space for shaping the settings referred in this study. Further research is planned with the aim to develop the proposed methodology for the chosen case.

Panerai et al (2009) propose a concept of habitus, which seems significant for the present considerations, and which assumes that urban structure, as reflecting the repetitions of social practices of everyday life, becomes the form of record of these practices. With time, the recorded layout may become a contribution to the further continuation of the former way of use of space – and this case takes place in Lodz. In a globalising world man must find out how “basic cultural systems such as time and space are used to organise behaviour.” (Hall 1989, p.55) – this conclusion starts to influence contemporary urban design thought as numerous studies show (Schumacher, 2011; Jones, 2007). The thread of cultural studies imports a viable resource to the proposal of ontology for urban design, which is being developed e.g. by Duarte et al. (2011).

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