COMPLEX ANALYSIS FOR THE SUSTAINABLE PLANNING AND CONSTRUCTION OF THE PLACE IDENTITY: THE SENSITIVE RELIEF METHOD

M. SEPE

Consiglio Nazionale delle Ricerche, Rome, Italy.

Dipartimento di Progettazione Urbana, Università di Napoli Federico II, Naples, Italy.

ABSTRACT

The city is not an artificial construct: the city is a set of habits, customs and lifestyles. These elements are interrelated, and rather than being viewed individually, they are subsumed in the identity of place and the identification of the city. The contemporary city is characterized by complexity, simultaneity and instability, producing situations of transience and transformation. As a matter of fact, the mutations in interpersonal relationships and intergenerational gaps, technological development, mass migrations and globalization have transformed the spaces in the urban landscape; new types of place have arisen and the utilization of existing spaces has been modified. These transformations have contributed to an increasing urban identity crisis and transformed cities into heterogeneous, multi-ethnic and multicultural societies. The new urban features of the territory are not easily identifiable and cannot be represented by a traditional planimetric relief, often remaining 'invisible'; other elements can only be identified by sense perception, which becomes a measure of analysis and a reference for planning. In order to give suitable terms and explain such new sites, several academics have tested maps, words and multimedia images, hypertext and software able to render this complexity and to permit readability, which have in most cases created new interpretations of urban features. Starting from this premise, the aim of this work, carried out in the framework of a Convention between the Consiglio Nazionale delle Ricerche and the Dipartimento di Progettazione Urbana, Università di Napoli Federico II, is to illustrate the analytical method of the Sensitive Relief. This method individualizes those elements that have value for the identification of the place identity, and are able to provoke cultural transformations and also influence the sustainable urban complexity construction. The final product is a complex map and the relative legend is designed to integrate the traditional planimetry and support the sustainable urban identity planning and construction. The Sensitive Relief method has been tested in various European cities and beyond; in this paper the results of the application to an urban area of Naples are presented.

Keywords: complex mapping, place–identity, Sensitive Relief, sustainable city, urban planning.

1 INTRODUCTION

The changes in the contemporary city have contributed to an increasing urban identity crisis [1], transforming European cities into complex, heterogeneous, multi-ethnic and multicultural societies [2, 3] and blurring national identities [4, 5]. As a matter of fact, the mutations in interpersonal relationships and intergenerational gaps, with the ensuing new demands, technological development, mass migrations and globalization have transformed the spaces in the urban landscape [6, 7]; new types of place have arisen and the utilization of existing spaces has been modified [8, 9, 10]. Recognizing the value of a place as a fundamental component in urban identity serves as a reference point both in terms of the wishes of the collectivity and in safeguarding and constructing the sustainable urban image [11, 12, 13, 14]. As Graham writes, landscape narratives—including built heritage narratives—facilitate the creation and enhancement of national identities by 'denoting particular places as centres of collective cultural consciousness' [15]. Cities have to find out how to reduce the risks inherent in the tendency of contemporary urban societies to fall back on their heritage and roots as they face up to an identity crisis. In this respect, innovation in urban space design represents an opportunity to construct a European identity of places and give an international scope to the urban form of European cities [16].

Traditional cartography proves to be unable to identify and represent the complex contemporary place identity and the urban cultural background in which the new schemes are to be constructed. Researchers have therefore imported from other disciplines ways to see, explain and represent urban complexity, constructing specific methods of transversal, multilevel decodification and analysis. Mapping involves five main categories, featuring virtual [17], multiscale [18, 19], lateral [20], nomadic [21] and complex-sensitive approaches [22]: these approaches are not separate entities but intersect at several points, revealing the main elements characterizing contemporary urban identity [23].

In particular, the complex-sensitive approach studies the urban place in all its complexity and is open to all possible stimuli, identifies and represents elements linked to features which are both perceptive and objective, permanent and transitory. In this framework, the proposed Sensitive Relief is a method for analysing the urban landscape which identifies elements that do not feature in traditional mapping and which constitute the contemporary identity of the places, representing them in a map that renders the sites intelligible. This method was developed in the context of a broader research project carried out in the framework of a Convention between the Consiglio Nazionale delle Ricerche and the Dipartimento di Progettazione Urbana, Università di Napoli Federico II, entitled 'The identity of the contemporary city and cultural, landscape and environmental assets: representation of the new urban culture, with hypotheses for future scenarios between integration and sustainability'.

The proposed Sensitive Relief, unlike other analytical approaches which study only one aspect of the site (perceptive, urban, etc.) or multidisciplinary approaches which collect a lot of data but have difficulty collating them, considers the places from all points of views and with different but compatible tools of relief. To represent the results, the method of analysis produces a complex map that provides a complex image of sites. The complex map is intended as a support for integrated strategies on the urban and territorial scales and tool of knowledge: it can help administrators and professionals make informed decisions for sustainable planning and construction of the place identity and serve as a source of information for citizens and all users of the sites investigated.

The paper is organized as follows. In Section 2 the Sensitive Relief method is illustrated. Section 3 gives a brief overview of the experimentation carried out in European cities and beyond, while a complete and detailed case study concerning an area of the city of Naples is presented in Section 4. Section 5 reports some observations about the method and the experimentation. Finally, the conclusions are presented in Section 6.

2 THE SENSITIVE RELIEF METHOD

The method is constituted by five phases and a preliminary phase (Table 1). In *Phase 0* an *ad hoc* database is created to collect and store a wide variety of data gathered from the following modes of analysis: anticipatory (sketches, poems, collages, etc.); denominative and perceptive (using words); graphical (signs and symbols); photographic (fixed images); video (moving images); elements deduced from the study of traditional maps (graphic signs, symbols, etc.); the questionnaire administered to visitors (sketches, words, etc.).

This mass of data serves to *construct a grid* that will be used in all subsequent operations. This involves deciding on the categories of elements to analyse and the corresponding measurement parameters. Moreover, for the chosen reference period for urban changes it is necessary to establish which days and time slices are most significant for the relief.

The categories of elements to be analysed are chosen according to the nature of the place in question. The categories, and corresponding parameters used to measure and characterize them, which feature in the description of the second and third phases, in particular, were chosen during experimentation of the method. The data collected during each phase of the Sensitive Relief are then summarized and transformed into symbols and represented in the partial and final maps.

Table 1: The Sensitive Relief scheme.

Phase	Objectives	Actions	Products
0	Construction of the analysis grid	Choice of categories Choice of parameters Choice of significant days Choice of time slices	Grid of the database
1	Anticipatory analysis	Preliminary observations carried out prior to first inspection	Map of preliminary ideas of the place
2	Perceptive and denominative description of the elements	Denominative relief Perceptive relief Graphical relief Photographic relief Video relief	Map representing the results obtained from the reliefs
3	Use of traditional cartography to identify elements required for the area description	Analysis of traditional planimetry on: • urban scale • territorial scale	Map showing the site components deduced from traditional cartography
4	Identification of elements of the place perceived by people not involved in the study	Questionnaire for visitors	Map representing the results of the questionnaire
5	Elaboration of the collected information	• Combination of maps featuring elements observed from anticipatory and effective analyses • Cross-check of elements observed using different tools of analysis	Construction of a: • graphic system • complex map

Phase 1 involves the gathering of preliminary observations prior to the first visit to the site. The aim is to *analyse expectations*: once the city or area(s) to be investigated has been chosen, the ideas one already has concerning the site are assembled using whatever tool or means of expression you wish. This can include information from reading or research or previous knowledge. This phase will result in a map of the various ideas concerning the place, showing elements considered as belonging to the place. Although apparently abstract, this phase is highly significant because it involves relating to a place using the imagination, making a start on recognizing the place's identity.

Phase 2 involves drawing up five *reliefs* in order to identify the area's characteristic elements from the nominal and perceptive viewpoints.

The first relief, *nominal*, consists of assembling data concerning man-made elements (presence of monuments, buildings, etc.), natural elements (presence of urban greenery, trees, animals etc.), means of transport (presence or transit of cars, buses, etc.), people (presence of tourists, residents, etc.), recording localization, typology and quantity (expressed in small, medium or large concentrations). Rather than listing all the elements present, the idea is to record the typologies of elements which go to characterize that particular place: a historical building, a fountain, a form of paving, the presence

of cars or bicycles, tourists, hawkers, the type of vegetation, etc. The nominal relief is backed up by a sort of flexible database of relevant information where elements can be inserted during on-site reconnaissance.

The second relief, *perceptive*, records findings connected with smell, hearing, taste, touch and sight, and the overall perception, paying attention to localization, typology, quantity (expressed in small, medium or large concentrations) and quality, i.e. whether the sensation was perceived in an insignificant, pleasing or disagreeable manner. The categorization of findings in terms of quantity and quality according to three alternatives serves to simplify the elaboration of data, which in any case can be recorded more completely during the investigation.

Similar to the nominal relief, it is not necessary to register all the perceptions present but only those which are characteristic or salient: the noise of wind or traffic, the smell of flowers or food, the feeling of materials used for the paving, a striking view and, in addition, the global perception given by the sum of the sensations.

The next step is the *graphic relief*, based on sketches of the area backed up by any relevant annotations. This operation is fundamental in the construction of the graphic symbols to be used in the final complex map.

Then follow the *photographic* and *video reliefs* of the whole study area, featuring the site as a whole and the details, taking care to record the reality rather than its interpretation.

While the photographs provide 'stills' of the area, the video footage can give an idea of the rhythm, cadence and dynamics of the place.

Each of the five reliefs, taken singly, is not able to give a complete idea of the place. Only when all the data collected during the drawing up of the five reliefs come together is it possible to have comprehensive information on the elements of the place in nominal and perceptive terms, of a sort that does not emerge from a traditional analysis. The final product of this phase consists of a map showing the salient elements.

In *Phase 3* the area is studied using *traditional maps*, in order to identify elements on the urban scale, seeing how they interrelate, and on the territorial scale, viewing the area in the context of the surrounding territory. The typology of maps used will depend on the nature of the place, and the outcome of this phase is a single map showing elements with external and internal significance.

The importance of this phase lies in gaining an understanding of all those elements, such as the morphology of the site, the presence of particular types of urban building, the historical stratification, the main directives, the form of the public squares and concourses, and the relationship of the area with the rest of the city, which can be assimilated by looking at a traditional map but can only be guessed at from a nominal and perceptive analysis.

Phase 4 concerns the questionnaire to be completed by visitors to the area. The aim is to find out how the place is experienced by people not involved in the projects or with a professional interest. This will involve various levels of 'users', such as residents, passers-by and tourists. The questions investigate the images people have of the area, and this phase involves visiting the area with the respondents. Once again the outcome is a map, compiled from the information produced by the questionnaire. This information may well be very heterogeneous, but the map is a record of how the place is experienced, imagined, used and remembered by its users, and can also give indications as to how the place might be improved.

In *Phase 5* the partial maps are combined and the various elements that have emerged can be cross-checked. The aim is to re-elaborate the information gathered by assembling and reconstructing the data derived from surveys based on physical reconnaissance, sensory perceptions, graphical elaboration and photographic and video records, and sets this data against expectations, analysis based on traditional cartography and questionnaires given to local inhabitants. In this phase the

selection is made of the elements to be included in the final complex map. This phase is particularly important since it involves making a selection and verifying the existence of incongruencies. As well as the complex map, the outcome will be the graphic system of symbols representing the salient elements of the place's identity [24].

3 EXPERIMENTATION

The method was conceived in 2001 and has been continuously elaborated and enriched during the experimentation that started in 2002. The case studies have investigated urban areas in Europe and beyond that are highly representative of the cities in which they are located, revealing differences and points in common. It has been possible to test the various instruments used in the five phases of the Relief, to time the various phases and the elaboration of the outcomes, and to perfect the final map in terms of the complexity of the analyses carried out.

In some case studies, as for example Naples, Rome, Lisbon, Boston and Mexico City, an area of the historical centre was chosen featuring a mixture of touristic, commercial, residential and occupational activities. In Naples, the area Via Calabritto–Piazza Plebiscito–Galleria Umberto I; in Roma, Piazza di Spagna–Via Condotti; in Lisbon, the Rossìo; in Boston, the area of Newbury Street; in Mexico City, the 'zona rosa'. In Berlin, Barcelona, Helsinki and Vienna the places chosen were famous touristic, historical and commercial itineraries associated with the city's image: the Ramblas, in Barcelona; the Ku'damm, in Berlin; the Etelaesplanadi-Pohjoisesplanadi, in Helsinki; the Kartnerstrasse, in Vienna. For these case studies the Sensitive Relief investigated the metamorphoses, transformations and compromises due to contemporary urban life and globalization, as well as nuclei of urban tension and possibilities for a sustainable redesigning of the place identity.

These topics have been pursued further in a case study carried out on the historical centres in the Province of Caserta, Southern Italy, focusing on the prospects for commercial development [25]. This research called attention to the current state of commerce in the historical centres, in order to requalify, commercially and culturally, places which are suffering a gradual decline and abandonment. The Sensitive Relief method investigated all the components of the urban scenario related to commerce which go to identify these sites, throwing light on the current urban landscape and the elements and 'materials' which make it up, the insertion of traders in the historical centre, the patterns of use for the historical centre and its shops, and the overall perception of the place, with its rhythms, vocation and potential.

Two other case studies have involved the historical centre of Sant'Angelo dei Lombardi, in Irpinia, Southern Italy, which was studied in the context of the Progetto Dimostratore Irpinia promoted by the Centro Regionale di Competenza in Analisi e Monitoraggio del Rischio Ambientale AMRA [26], and the area of Kitano-cho in Kobe, Japan. Both are examples of areas that suffered heavy damages during earthquakes, where the lack of a solid culture of safeguarding of urban and landscape identities meant that even greater damage was produced, particularly in Irpinia, by misconceived reconstruction due to which the population still has difficulty in identifying with the new places. The approach to these case studies has involved recognizing the complex identity of the sites following reconstruction, to what extent the earthquake still affects current reality, and how to go about sustainable rebuilding and at the same time safeguarding the place identity.

One more example featured the construction of a Cultural District in an area of the Cilento, in Southern Italy. This area has a very rich natural environment and cultural heritage which is still to be fully enhanced and exploited, involving the creation of a network of sustainable socioeconomic development in the territory. In setting up this complex series of initiatives, the first step is to identify the key areas characterized by a common cultural identity through a multidisciplinary analysis of the places.

The Sensitive Relief and the complex map proved invaluable in identifying the key areas in a future sustainable Cultural District [27].

The case study involving Naples described below is paradigmatic because the urban area covering Via Calabritto–Piazza Plebiscito–Galleria Umberto I presents an urban identity which still awaits redefinition in view of the many changes currently under way in the area itself and the immediate surroundings [24]. In recent years Naples has undergone major transformations and its identity is still evolving. The study area has a clear urban layout and occupies a central location in the city, with a mixed touristic–commercial–residential–occupational nature, in which no one component prevails over the others. It is 'used' by residents, tourists and professional classes; it contains monuments and sites which are emblematic for the city including the Royal Palace, Galleria Umberto I, Piazza Plebiscito, as well as features that can be seen in the distance, such as Sant'Elmo Castle, Vesuvius and the port. In addition, it contains public and private offices, residences, hotels and guesthouses; new 'multicontainers' such as cinema complexes and new places for socialization such as a mega-bookstores; pedestrian concourses, thoroughfares and bus routes. In the surrounding area there is a large historical monument currently being refurbished and urban parks and gardens; the infra-structure for urban transport are being reinforced with microinterventions of contemporary design and architecture. For the moment it is not clear how the image of the city will be affected by these transformations, nor in particular to what extent the identity and role of such a central, emblematic area will change. In this case the Sensitive Relief is a useful tool for identifying and representing these urban changes, to be proposed to local administrators and experts in what is still a transitional phase involving the enhancement and/or sustainable redevelopment of the place identity.

4 THE CASE STUDY

The chosen area in the city of Naples includes the quarters of Chiaia and San Ferdinando, especially Via Calabritto–Piazza Plebiscito–Galleria Umberto I. As regards the time schedules, the morning and afternoon slices were chosen, while, in terms of days, surveys were conducted during one weekday, one semi-holiday (Saturdays) and one holiday (Sundays, Christmas, Easter, etc.).

We begin with *Phase 1*, the instrument used to analyse the expectations, which is the written word and whose results are summarized below.

With regard to the anticipatory analysis of the morning time slice of the survey: Via Calabritto is a road that is used mostly for commercial purposes with high-fashion and jewellery shops; Piazza Santa Caterina is a place mostly for passing through without any precise connotation. The innovative element is the new bookstore, a place of new socialization because of its multiple functions. Piazza dei Martiri is a place with a mix of residential buildings, offices, etc., and a clearly delineated conformation. It presents quite a contrast to Piazza Trieste e Trento; Via Chiaia is a road that is used mostly for residential and commercial purposes. It has no great interest from the architectural point of view, and is suitable for walking and shopping. The Piazza Trieste e Trento–Piazza Plebiscito–Galleria Umberto I area with historical monuments and empty spaces represents a place where users of the zone or the city and tourists can socialize. It could be interesting to understand its dynamics, above all in relation to other places for socialization. With regard to the survey in the afternoon hours: in Via Calabritto there will be more pedestrian traffic than in the morning and the users will be of different types; in the afternoon Piazza dei Martiri will be populated by a larger number of professional people; in Piazza Santa Caterina, the spaces in front of the new bookstore will be more crowded than in the morning hours; Via Chiaia should not give rise to too many changes in terms of perception; in the Piazza Trieste e Trento–Piazza Plebiscito–Galleria Umberto I area there will probably be a smaller quantity of tourists and schoolchildren, but a larger number of professional people.

Let us move on to *Phase 2* and the first two reliefs, *denominative and perceptive*, whose information collected through the database and some related observations are reported in the synthesis. During the course of the surveys regarding the squares, various types of characteristics were found: Piazza dei Martiri is seen as a place where people pass through (residents, traders, shoppers) rather than a place for socialization. Even though there is a monument in the centre of the piazza, it does not change the life of the site as it is fenced off and there is nowhere to sit down. Paradoxically, the visual element consisting of the large advertising hoarding covering the scaffolding on the façade of a palazzo catches the eye of the observer more than the monument. The same is the case for Piazza Plebiscito where, in spite of the presence of monumental buildings like the church of San Francesco di Paola and the Royal Palace, there is a void in between, delimited by two buildings in symmetrical positions, that make it a place for passing tourists, people heading for other destinations, schoolchildren, rather than a place for socialization. No natural elements are noted except the background towards Via Marina, the view of Vesuvius and the sea, but it seems that they do not directly connote this space. The only natural element in the square is the presence of pigeons on the pavement in front of the San Francesco di Paola church. Piazza Trieste e Trento appears instead the closest to the concept of a public square as a place for events and socialization. Numerous elements of connotation are found there: a fountain in the centre that represents a visual focus (it lies in the centre of the square) and an acoustic one because of the sound of the water; the church of San Ferdinando, the prospect on Via Chiaia, Via Toledo, Piazza Plebiscito, the San Carlo Theatre; the historical Café Gambrinus and the other pavement cafés. The noise from vehicles is so great that it blocks out the sound of the water. Another observed sound is that of the church bell that rings every 15 minutes. There is also the element of the large advertising panel that covers the church restoration works. The pace of the place is quite calm and different kinds of people are observed: from mothers with prams to beggars, tourists, passers-by, professionals, artists. The police and an ambulance are stationed in the centre between the two squares, and a small electronic billboard displays the latest news, while another gives information on bus timetables. With regard to the Galleria Umberto I, the following may be noted: the gallery constitutes a typical space for socialization and trade, the people move at a rather hectic pace and the general perception of the place is not of serenity. There are also various background noises that contribute to this slight state of uneasiness. Smells of baking come from cafés and shops that sell typical pastries, a required stop for many tourists. In Via Chiaia, there are no annotations of interest within this analysis, perhaps because of its homogeneity of functions. It should be noted that this road lives particularly towards the outside: the Spanish quarters, the deep courts of the buildings, the stairs, the Chiaia bridge. It looks like a façade, but life goes on inside such places. Returning along Via Chiaia in the opposite direction, from Piazza Plebiscito to Via Calabritto, little or nothing seems to change in spite of the opening of the stores. Perhaps a slight increase in the pedestrian flow. The same holds for Piazza Santa Caterina, Piazza dei Martiri and Via Calabritto. The fact that close to noon there was nobody in the squares created some doubts. So we went into the new bookstore in Piazza Santa Caterina and found quite a notable concentration of people: a climatized space, a slight smell of coffee, the bookcase sector, the CD sector with the option of listening, a video screen, spaces for breaks, a sofa and small tables for the bar have increased the flow of customers. It is a place where people go in order to relax, allowing themselves the luxury of slowing down, perhaps because they can relax without feeling the guilt imposed by a society with a hectic pace (the break has cultural aims). Moreover, outside the bookstore we are still within the city walls, unlike the case of some megastores constructed in the city suburbs. During the survey, other data were gathered about the pace of life and times of the city. These elements were observed to be part of the identification of a site: two places with the opposite pace of life are, for example, the Galleria Umberto I (hectic) and the Piazza Santa Caterina bookstore (quiet). A common element among the open places concerns

the porphyry pavement, which represents a strong element of tactile perception, and the presence of quite homogeneous urban furniture.

With regard to the third relief, the *graphic* one, many sketches were made concerning the visual perception of the places and the first useful signs were drawn to construct the system of symbols to be inserted in the complex map.

As for the *photographic* relief, approximately 200 photographs were shot during the various surveys and in all the sites in question, recording the 'stills' of the places and whatever element might be useful to the aims of the analysis. With regard to the last relief, the *video* relief, the footage had in particular the functions to record data regarding the cadence and the dynamics of the places.

The images presented are some examples of data on the 'stills' of the places (see Figs 1–4) and the rhythm of life in the study area (see Figs 5 and 6).

Phase 3 involves the analysis of traditional planimetry of the area at a scale of 1 : 1000 and 1 : 10,000 (see Figs 7 and 8).

In the analysis on the urban scale the interesting elements concern especially the kind of system and morphology of the places, the presence of axial roads and interruptions of continuity, of monuments of historical and cultural interest, of green spaces; while in the analysis on the areal scale we highlight where the area is bounded by the sea, the public park of the Villa Comunale, Vesuvius, Sant'Elmo castle, the places of historical and cultural interest, the main roads, and the various viewpoints.

Phase 4 concerns the questionnaire; the questions that the users of the place were asked during a survey are: What elements in this area strike you (people, things, etc.)? Can you see one or more element that arouses a particular sensation or that reminds you of an important moment for any reason? Are there elements that disturb you? If something in these places could be changed, what would you change and why? Could you compare this area to another area of Naples or to another city? If so, which and why? Which of these images do you prefer and why? (See Fig. 9.)

The interviewees are not informed beforehand about the specific reason for the survey. It is only generically explained that it concerns research into the cultural characteristics of that particular place, in order to obtain responses that are spontaneous.

Figure 1: Area with monument of Piazza dei Martiri.

Figure 2: Piazza Trieste e Trento, view of the advertising panel and Galleria Umberto I.

Figure 3: View along Piazza Plebiscito.

Figure 4: View from Piazza Plebiscito.

Figure 5: Rhythm of life in Piazza Plebiscito.

Figure 6: Rhythm of life in Piazza Trieste e Trento.

The questionnaire, which is expected to last approximately 30 min, includes not only short questions on personal data (age, kind of profession, use of the place, etc.) but also seven questions concerning the general perception and personal idea of the place through a survey and the viewing of some images.

Briefly, the responses to the questionnaire show the following: Piazza Plebiscito and its monuments are the elements that mainly strike respondents; Piazza dei Martiri is an area that provokes a sense of solitude, Via Chiaia of chaos, Piazza Plebiscito of empty space, Piazza Trieste e Trento of a metropolis; an annoyance factor is the noise in Piazza Trieste e Trento; Piazza Plebiscito is a place that provokes a strong feeling; the areas that would be changed are Via Chiaia, the organization of Piazza Plebiscito and the space between Piazza Trieste e Trento and the Royal Palace; the study area reminds interviewees partly of Genoa, partly of Venice and in general of maritime cities due to the presence of the sea—even though the sea is barely seen, but it is just perceived—and the monumental area.

Phase 5 involves the reprocessing of the collected data to construct the system of symbols to represent the different elements of the contemporary place identity and create the map supported by a adequate legend (see Figs 10 and 11).

Based on the observations and the re-elaboration of the relative maps of the four previous phases, a system of symbols and the map were constructed. The shape of the symbols was created bearing in mind two components: the signs of the graphical relief and the comparison of the sign
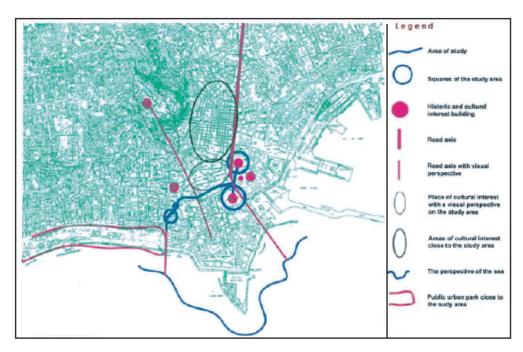
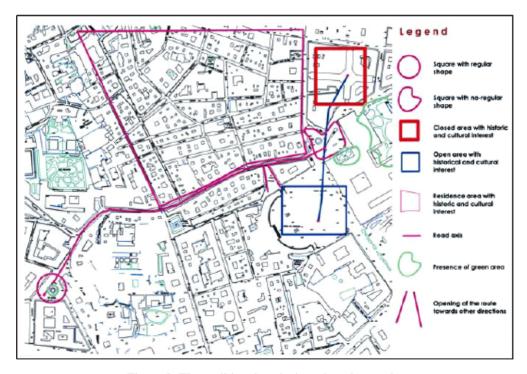Figure 7: The traditional analysis at the territorial scale.

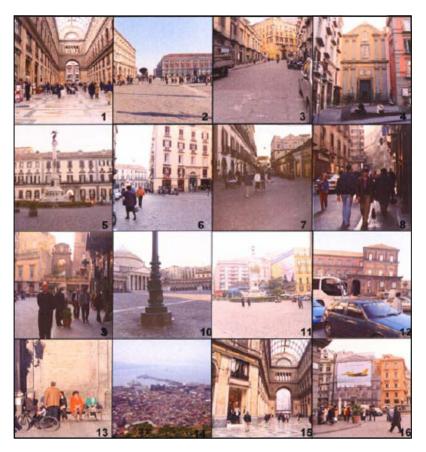Figure 8: The traditional analysis at the urban scale.

Figure 9: The images of the questionnaire.

with the meaning. Another criterion adopted concerns the size of the symbols; three sizes were designed (small, medium or large) referring to the percentages quantifying the presence of that given element (low, medium or high). We also matched the symbol with a number in order to indicate in the legend the element to which it referred.
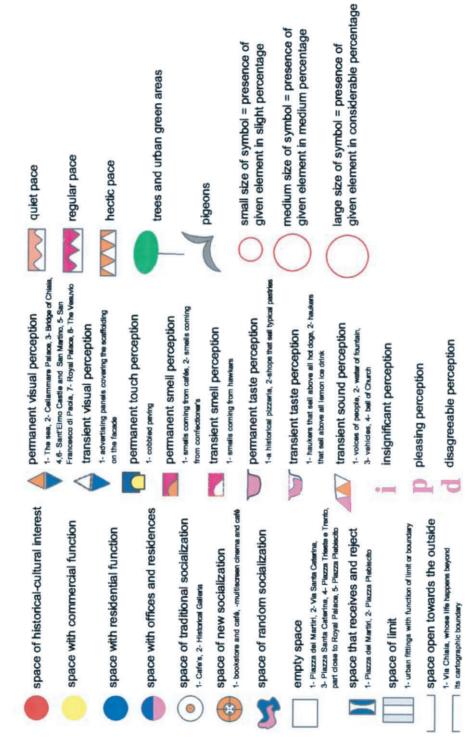
Finally, it was decided to summarize the feelings concerning the elements of the perceptions as insignificant, pleasing or disagreeable and to place beside each number the first letter of these words in order to indicate them. The strong and contrasting colours that were used aim to attract and activate the visual perception and overall perceptions. The full or half-full closed circles are symbols that were chosen in order to visualize the concept of space, linked to the idea of circumscribed area.

For the places of casual socialization, instead of a precise shape, we chose an imprecise curved shape, which recalls the idea of aggregation. The uncoloured square is used to recall the sense of empty space. The concave–convex symbol is intended to recall the concept of the place that receives and rejects at the same time. The square with the coloured vertical bands and an uncoloured band in the centre was used to indicate a limit and/or boundary. Two square horizontal brackets open towards the outside were used to indicate a place where life goes on beyond its cartographic boundary.

For the symbols concerned with perception, two fundamental types were created: one for permanent perceptions and one for transient ones, the former being denoted by symbols with a solid line and colour, the latter with a dotted line and half-coloured. The ten perception symbols recall shapes of body parts connected to the respective actions of seeing, touching, smelling, feeling and tasting.

Figure 10: The complex map.

L E G E N D

space of historical-cultural interest

space with commercial function

space with residential function

space with offices and residences

space of traditional socialization
1- Cafés, 2- Historical Galleria

space of new socialization
1- bookstore and café, -multiscreen cinema and café

space of random socialization

empty space
1- Piazza dei Martiri, 2- Via Santa Caterina,
3- Piazza Santa Caterina, 4- Piazza Trieste e Trento,
part close to Royal Palace, 5- Piazza Plebiscito

space that receives and reject
1- Piazza dei Martiri, 2- Piazza Plebiscito

space of limit
1- urban fittings with function of limit or boundary

space open towards the outside
1- Via Chiaia, whose life happens beyond
its cartographic boundary

permanent visual perception
1- The sea, 2- Cellammare Palace, 3- Bridge of Chiaia,
4,6- Sant'Elmo Castle and San Martino, 5- San
Francesco di Paola, 7- Royal Palace, 8- The Vesuvio

transient visual perception
1- advertising panels covering the scaffolding
on the facade

permanent touch perception
1- cobbled paving

permanent smell perception
1- smells coming from cafés, 2- smells coming
from confectioner's

transient smell perception
1- smells coming from hawkers

permanent taste perception
1-a historical pizzeria, 2-shops that sell typical pastries

transient taste perception
1- haukers that sell above all hot dogs, 2- haukers
that sell above all lemon ice drink

transient sound perception
1- voices of people, 2- water of fountain,
3- vehicles, 4- bell of Church

insignificant perception

pleasing perception

disagreeable perception

quiet pace

regular pace

hectic pace

trees and urban green areas

pigeons

small size of symbol = presence of
given element in slight percentage

medium size of symbol = presence of
given element in medium percentage

large size of symbol = presence of
given element in considerable percentage

Figure 11: The legend for the complex map.

For the symbols denoting pace, we used signs that recall the speed to which they refer and the perceptions that derive from them. For the symbols of the natural elements we used the stylized real reference image.

Once the symbols were created, they were inserted in the map, whose graphical basis consists of the area boundary, placing them at the point where they were found.

5 OBSERVATIONS

Some significant points have emerged concerning the method of the Sensitive Relief during the experimentation. *Phase 0*, concerning the construction of a database suitable for collecting and collating different kinds of data, is still being improved: the records used for gathering data have been formulated, and the Sensitive Relief was drawn up without the aid of the computer to cross-check the data collected during the various phases [22]. Nonetheless, the most appropriate typologies of hardware have been identified and a specific software is currently being developed for all the phases of the Sensitive Relief and the construction of the final map. With respect to *Phase 1* the major difficulties concerned the choice of the most suitable means of expression for expectations: the type of observations made appeared vague and rather meaningless. Still, at the end of the process of analysis such annotations can be of use in understanding a place. In this phase the use of imagination is fundamental: one only has to think how this is used and indeed engendered by the tourism and advertising industries in order to invent an identity for a place. The gathering of data for this phase of the Sensitive Relief can involve sketches, ideas jotted down, collages or any other means of expression that seem appropriate. In order to make the operation of transforming ideas into symbols more straightforward, it is preferable to choose just one means of expression for each analysis.

In *Phase 2* it emerged that it is better to formulate the five types of relief concurrently, so as to be sure of having data that are comparable and compatible. The parts of the perceptive relief that took up most time were those concerning taste, smell and touch. In these cases the method used comparison and deduction, describing and measuring these sense elements partly by approximation and in relation to the other senses, notably sight and sound. We believe that the random nature of the results obtained does not seriously affect the analysis because the final perception of the place is the outcome of a whole range of perceptions and not just one, unless of course there is one component which is so overwhelming as to eclipse the others; in such a case it is actually simpler to record and measure it. Following the experiments we carried out, the indication of percentages (low, medium or high) helps to summarize the quantity parameter, and if there is no such clear difference in quantity, the database can adopt other parameters to manage the data. Similarly, in terms of the perceptive relief it was decided to refer to insignificant, pleasing or disagreeable features in order to ensure a uniform typology of measurement. While elements of acoustic perception, for example, can be measured scientifically, for others such as taste there are no such objective parameters. If a relief requires additional parameters, once again the method ensures flexibility. The graphic relief represented an important moment because it gave the possibility of setting down on paper elements and places that had been observed, providing the bases for developing the symbols for use in the final map.

The difficulty in *Phase 3* lay in choosing which elements to record. It was decided that this phase should follow that of the reliefs so as not be influenced by knowledge of the planimetry; but at the same time one had to take care to approach the traditional cartography in an objective manner, without being influenced by what had transpired during site reconnaissance.

Coming to the interviews in *Phase 4* held with 'users' of the place, it was necessary to accurately programme the typology and number of subjects interviewed in order to obtain significant, compatible data. The questions had to be appropriate to the place and also perfectly intelligible to all: they cannot be too specific or specialized, since they are intended for passers-by, tourists and residents.

As had been found in other pilot schemes, however, this part of the Sensitive Relief involves many unknown quantities, on account of people's reactions. In some places, such as tourist sites or recreation areas, people are perfectly willing to take the time to answer a questionnaire, whereas in places of transit where people are above all making for their workplace, they have much less time or the inclination to stop and answer.

As for the final outcome, the complex map, the main difficulty in *Phase 5* lay in assembling the various types of data available, including the maps, and turning them into unambiguous graphic symbols. To be sure that the collected data is coherent it is necessary to operate continuous crosschecks with the findings concerning expectations, traditional mapping and on-site reconnaissance, as well as from the various specific reliefs. The topics most liable to show incongruencies have proved to be urban areas affected by new or critical developments, which are also the most interesting subjects for analysis. It is necessary to guard against constructing a complex map that is so full of information that it appears cluttered and difficult to read. An adequate legend is also fundamental.

6 CONCLUSIONS

This article has illustrated the method of analysis constituted by the Sensitive Relief and some practical applications, with particular reference to an experiment carried out in an area of the historical centre of Naples. This study was carried out in the context of the research project entitled 'The identity of the contemporary city and cultural, landscape and environmental assets: representation of the new urban culture, with hypotheses for future scenarios between integration and sustainability', coming under the framework of a Convention between the Consiglio Nazionale delle Ricerche and the Dipartimento di Progettazione Urbana dell'Università di Napoli Federico II. The starting point was the observation that the contemporary city is the place of complexity, simultaneity and instability, which determine situations of transience and transformation, causing an increasing urban identity crisis. Cities in Europe have to find a way of reducing the risks inherent in contemporary urban society; one possibility is to introduce innovative designs into the urban space in order to generate a new place identity, which may in turn internationalize the urban form.

Traditional cartography is still unable to represent the new place identities of contemporary cities because it cannot encompass the urban cultural matrix underlying the new design schemes. The proposed Sensitive Relief is a method for analysing the urban landscape designed to identify elements that do not feature in traditional mapping and which constitute the contemporary identity of the places, representing them in a complex map that renders the site intelligible. Unlike other analytical approaches, which study only one aspect of the site (perceptive, urban, etc.), or multidisciplinary approaches, which collect a lot of data but find difficulty collating it, the Sensitive Relief method considers the places from all points of views and with different but compatible tools of relief. This method assembles, elaborates and reconstructs the data derived from surveys based on physical reconnaissance, sensory perceptions, graphical elaboration, photographic and video records, and sets this data against that provided by an overview of expectations, an analysis based on traditional cartography and a questionnaire given to local inhabitants. The peculiar feature is that, far from excluding traditional types of analysis, it integrates them with other approaches serving to understand the place in all its complexity.

The complex map of place identity provides both analytical data about a place and the information required for intervention and development. It is an aid in establishing identity in the contemporary city, for integrated planning strategies on the urban and territorial scales, for the informed decisions of administrators and professionals in the sector, for citizens and tourists. The map can be used to redesign, with sustainable criterion, the identity and image of a place in terms of an initial question

(concerning for example its historical identity, commercial identity, etc.), or to understand the compatibility of an activity in terms of the sustainability or place's vocation, or again, if the intention is to repristinate existing activities, to verify whether a certain intervention is in line with current requisites. Thinking of local administrators, the place identity complex map can help at the planning stage to recognize the inherent potential and problems, a site's vocation and how it is perceived by those who use it and live there; for urban planners it can show how to collocate their intervention in relation to the context. For both administrators and planners, the data contained in the map can be used to construct active indices and reference parameters to study, for example, thresholds of quality of life or pollution, or other aspects concerning the project's sustainability. For citizens, the complex map can give a better idea of the identity of their city, giving a stronger sense of belonging, so as to become active in safeguarding and improving it in sustainable ways. For tourists it can be a type of map that introduces them to a more complete and sustainable knowledge of a city, going beyond the sights and monuments, capturing the identity in all its complexity and made up of so many tangible and intangible, permanent and transitory elements.

Further developments of the method are leading to the creation of analytical software and products that will be able to generate flexible and interactive maps.

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