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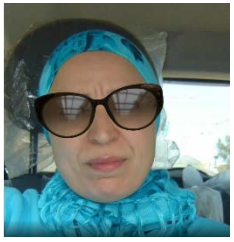

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Combining Scientific Approaches: A Methodology for Improving Spatial Equity. The case of Marginal Areas of Al-Harrach City

Access to space is a fundamental ethical right and contributes to realizing space ethics. In this regards, urban forms can reinforce or hinder spatial equity. If two-thirds of the population will live in cities by 2050, migration can increase social inequalities between residents and newcomers. However, urban studies rarely integrate ethical considerations as such. Over the past four years, we have been involved in experimenting with methodologies, which have engaged the computer, in explorations of both spatial analysis and design. This article describes a methodology for improving spatial equity that aims to strengthen social solidarity. First, perceptual analysis supports the visual analysis of the urban landscape. It aims at identifying the problem and the five elements structuring the urban space. Their outputs are mental image and Kevin Lynch's structure urban layout. Secondly, studying the structural properties by Spatial Syntax theory and techniques allows for examining the socio-spatial aspects of the place. Superimposing these three methods allows for visualizing data related to the urban morphology of the district. This dual approach allows setting the objectives and actions to implement the urban strategy. A marginalized neighbourhood of Al Harrach is an illustrative case study of this method. For the purposes of this article, we present only one students' urban project.

الملخص. إن إمكانية والوصول إلى الفضاء حق أخلاقي أساسي ويساهم في تحقيق أخلاقيات الفضاء. في هذا الصدد، يمكن للأشكال الحضرية أن تعزز العدالة المكانية أو تعيقها. وإذا كان حلول عام 2050 ثلث السكان سيعيشون في المدن، فيمكن لهذه الهجرة أن تزيد من التمييز الاجتماعي بين السكان والوافدين الجدد. الا أن الدراسات الحضرية نادرا ما تدمج الاعتبارات الأخلاقية على هذا النحو.

على مدى السنوات الأربع الماضية، شاركنا في اختبار المنهجيات، التي أشركت الكمبيوتر، في كل من التحليل المكاني وتصميمه. يصف هذا المقال منهجية لتحسين العدالة المكانية التي تهدف إلى تعزيز التضامن الاجتماعي. أولا، التحليل الادراكي يدعم التحليل البصري للمشهد الحضري. وهو يهدف إلى تحديد المشكلة والعناصر الخمسة التي تنظم الحيز الحضري. وتعتبر مخرجاتهما صورة ذهنية ومخطط حضري لكيفن لينتش. ثانيا، تسمح نظرية التركيب الفضائي، ولتقنياتها بفحص ودراسة الخصائص البنيوية للجوانب الاجتماعية المكانية للمكان. يسمح فرض هذه الطريقة الثلاثة بتجسيد بشكل فائق البيانات المتعلقة بالأشكال الحضارية للمنطقة. وتتيح هذا النهج الثلاثي تحديد الأهداف والاجراءات اللازمة لتنفيذ الاستراتيجية الحضرية. يعتبر حي الحراش المهمش دراسة حالة توضيحية لهذه المنهاجية. ولأغراض هذا المقال، لا نقدم سوى مشروع حضري واحد للطلاب.

Keywords:
Spatial equity, Mental image, Space Syntax, Urban studio project, Al-Harrach District.

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INTRODUCTION: DESIGNING URBAN SPACE

Since the last centuries, we are living in an unworthy environment that ruins our health and our morale. The technologically centred, rationalist and abstractionist approach of modernism reduced Man's attachment to his natural environment to its fragmentary relationships (Mumford, 1934, 1940). He was among the first urban planning scholars who paid serious attention to religion in the planning field. Privatism combined with high levels of economic inequality has led to the creation of unsafe places. In Dark Age Ahead (2004), Jacobs identifies five essential pillars of occidental culture that are in serious decline: community and family; higher education; the effective practice of science; taxation and government; and self-policing by learned professions. The decline of these pillars is behind environmental crisis, racism and the growing abyss between rich and poor. Their continued degradation could lead us into a new Dark Age.

A sure sign of city death is the collapse of the public realm where inequity (Adams, 1963) feeds crime on the streets (Newman 1972). Current ethics implies the "disappearance of ethics" or a "life without principles" (Bauman, 1993). Seen from this perspective, there is no ethics, or there is an ethic based on a degree zero of humility and an infinite degree of freedom and therefore, on a degree zero of both justice, democracy and solidarity. Therefore, the question of space ethics becomes unavoidable. Yet, the city faces the problem of its ethical role.

Scholars have approached question of space ethics as practical wisdom for the city (Plato, 360 B.C.E; Aristotle, 2002; Mc-Harg, 1969, Alexander, 1979; Jacobs, 1961, 1969, 1984, 1993; Lynch, 1981, Gilligan, 1982; Harries, 1997; Thomas, 2003; Chan, 2019; Belmessaoud-Boukhalfa, 2022). Wisdom guides both the city as a whole and the individual person. It provides unity to both the ideal society and the virtues. Long before, Plato stressed on justice (dikaiosune) in the Republic (in Jowett, 2008). Aristotle has stressed on justice both in the city and in the soul (Fig. 1). City's ethical foundations aim to ensure both the sustainability of societies, the expression of needs, fair sharing and avoiding clashes. Ethics provide residents with virtue, security and happiness (Aristotle in Thomas, 2003). The idea is that communicative power of architecture can support ethical values that are rooted in the content of this communication. A global approach based on an ethical system applied to urban design proposed a core of five critical ethical values in designing ethical urban spaces (Belmessaoud, 2006, 2012, and 2022). Equity value belongs to this ethical system and represents the display of justice.

Thus, designing ethical urban space engages the understanding of the lived space, its norms and its representation. The process explores a technique of design, in the realm of both concept and artefact. The student should have the capacity to make connections between concepts and objects.

According to Piaget (1950) and Piaget and Inhelder (1948), three types of representation of space exist:

1- The topological approach corresponds to an exploration by trial and error. The architect can tinker with a plan sketch by juxtaposing schematic zones, in order to seek a spatial organisation and know their place in relation to each other.
2- The Euclidean approach provides a definitive identification of the real position of the figures relative to each other, with a system of coordinates, distances and angles.
3- The projective approach simulates a visual image, in the same way as perspective, but it does not necessarily respect distances or proportions.

For Gagné (1985), five categories of learning fell into three particular domains: the cognitive domain, the psychomotor domain, and the affective domain. Each of these categories encompass a broad variety of human activities. The design studio approach described, in this article, tries to moderate the haphazard approach to create a holistic approach. It strives to find an objective tool for designing ethical urban design strategies.

The involved students are in 3rd year architecture studio. They experiment for the first time town planning. Thus, lecturers must be very committed to make the urban approach successful. All the concepts of urban design and urban planning must be defined because they are unknown to the students.

The method integrates the computer into the process of analysis and designing urban form for exploring its perception, the properties of its spatial

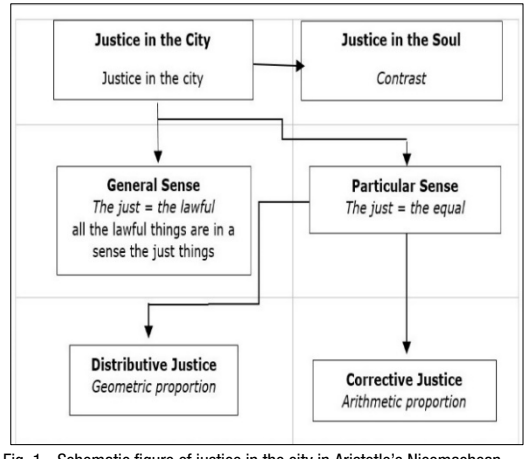

Fig. 1 - Schematic figure of justice in the city in Aristotle's Nicomachean Ethics modified by the author (https://en.wikipedia.org/wiki/Nicomachean_Ethics#cite_note-84).

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Table 1. Elements of Urban Equity modified (Belmessaoud, 2006)

Equity urban elements
Scale: *Subdivision of the city at the macro-scale* *Distributive justice is equal opportunities to all people.*
Equal ownership of land to individual. Avoiding : – *Zoning by fragmenting people and functions* – *speculative development Great difference in lot size* – *inaccessible uses (should be mixed)*
Morphological level *Unity : design meeting place by a design based on* – *figure-background clarity;* – *shapes* – *textures* – *colours and rhythms* *Hierarchy (Scale and proportion): Avoiding* – *Physical hierarchy: topographical segregation (vertical segregation richer on top and poorer on bottom)* – *Symbolic by great empty space* – *Excessive height and size : extra-human scale (monumental architecture)* – *Hierarchical ethnical division*
Arrangement level, allow equal access : – *Access to water granted to others (suitable design of infrastructures)* – *Air and light accesses not limited by encroachments* – *Access to public good afforded for all citizens (open street space, accessible to all and equipped for its functions) and services (education; shelter...)* – *Power structure should be avoided segregation transportation lines*
Typology: should be according to a principle of : Order, similarity and Coherence in exterior treatment
Household type: avoid flagrant segregation in lot size and exterior ornament, which is a formal expression of wealth: avoiding exterior decoration system in household.
Programming – *Planning institutions of culture rather than pleasure (indicator of diverting attention from social and economic inequities). Avoiding mass-culture oriented towards entertainment, leisure, distribution, efficiency and material rewards that creates a pure society of consumption.*
Sense of exclusion : avoiding – *Physical enclosure by a physical boundary which poses a problem of application and acts as physical form of discrimination (gated communities)* – *Segregated location (upper- lower)* *Social distance as private public realms (clubs) not accessible for all citizens, who feel a complex of inferiority and so become incapable of a sense of solidarity.*

syntax and choosing the spatial program. Manifesting laws of mathematical structure, this method has the effect of removing the empirical, ad hoc and uncertain character of spatial activities. The techniques inherent in computer-integrated exploration establish new dimensions in analysis and design that can be grafted onto conventional understanding. The combination of Kevin Lynch and Space Syntax methods has already been tested to analyse urban form (Dalton and Bafna, 2003; Tartag, 2016). We enhanced this method with the mental image that describes the emotions felt by students when visiting the site. Therefore, tools grounded both on phenomenology (cognitive) and structuralism are the bases of this approach. The aims were to initiate the design of more virtuous urban and architectural spaces where spatial equity is an essential value.
After a detailed presentation, the students were asked to use these methods, first to carry out an analysis of the urban district and to identify the problem; then in a second step, during the design task, to solve the identified problem and evaluate the ensuing urban project. Three learning domains were used to gather student Students' feedback: Intellectual Skills, Cognitive Strategies, and Affective Strategies. The effects of their previous knowledge of CAD were also explored.

SPATIAL URBAN EQUITY

Equity is the quality of being fair and just. This is the principle of moral correctness. The concept of equity is synonymous with fairness and justice. Many verses in the Qur'an ask for justice "*Verily, Allah orders justice and good conduct and giving to relatives and He forbids immorality and bad conduct and oppression*" (Surat An-Nahl 16:90). "*And give full weight and full measure, with equity.*" (Surah al An 'am). Other meanings are conformity to moral rightness in action or attitude and uprightness.
Maintenance of what is just, especially just treatment and due reward in accordance with honour, principle or law. Conformity to the truth, to the fact or to a sound reason: a justice of the peace (American Heritage Dictionaries). The value of equity or justice is linked with other values as others freedom (Spencer, 1897); or
It is a prerequisite of solidarity. The feeling of disadvantage in the soul of the individual produces resentment and the inability of community feelings (Walsterand al., 1973). Studying spatial urban equity can be summarized into three phases: quantitative equality (Rich, 1979), spatial equity (Tsou and al., 2005; Ma, 2020) and social equity (Newman-Kenworth, 1999; Burton, 2001). Quantitatively, distributing costs and benefits equitably resolve tensions. Broadly, spatial equity refers to the equitable and equal distribution of facilities and services in a space at any scale according to density. Defined and measured in different ways, it depends on the value systems of justice, fairness, and need. However, generally, studies on spatial equity involve measuring accessibility. Combining spatial syntax and population data can assess spatial equity. Social equity is associated with people's sense of well-being including the sense of belonging, and a sense of place and is linked to urban form compactness (Anderson and Ishwaran, 1965; Burton, 2001). Cities that most support equity are those with a large proportion of high-density housing and a large quantity of locally provided services and facilities. Providing cohesive elements and simplifying the division of labour, in complementary manner afford equity between people. Table 1 highlights the urban ethical principles of urban form.

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ANALYSIS TOOLS AND DESIGNING METHODS

Analysis of urban form and function allows an improved understanding of urban design processes. Testing urban design proposals give an indication of the potential degree of vital urban living. The mental image allows appreciating the quality of the urban environment through the users' perception. This visual analysis of the urban landscape allows a first detection of the site's problem. Lynch's method focuses on visual qualities of the city, tries to elicit the inhabitants' mental maps of their city and Hillier's method focuses on abstract spatial descriptions, and seeks to reveal their underlying structure or structures in relationship to observable behaviour (Dalton and Bafna, 2003). Urban spatial structure is a term used to denote and discuss the distribution of activities within an urban area. However, the structural plan achieved by Kevin Lynch's method allows generating the five elements structuring the urban space. Spatial syntax supports decision-making for well-functioning urban designs, enabling the creation of sustainable cities and communities. These combined tools could provide new insights in designing ethical urban spaces.

MENTAL IMAGE

The subject of the imagery continually manifests itself as being-in-space. Freud linked this experience to the phenomenon of the unconscious. Space would therefore be "non-existent" for the conscious. To access consciousness, the human being has two necessary tools: the representation of words and the representation of things.

The contribution of the latter would be ignored because reduced to a temporal and linear succession of iconic objects identifiable by words (Saint-Martin, 1987). However, for Aristotle, the senses, perception, memory, dreams, action are linked to form the basis of psychology. Impressions are stored in the sensorium (the heart), linked by laws of association (Fig. 2). Segal and Fusella's (1970) study confirms that image and perception are similar processes. René Thom (1972) defined spatial thought as the foundation of conceptual thought in humans.

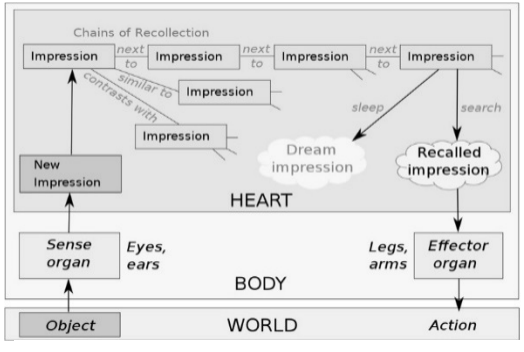

Fig. 2 - Senses, perception, memory, dreams, action in Aristotle's psychology. Source: Chiswick in https://commons.wikimedia.org/w/index.php?curid=67559741

URBAN SPATIAL STRUCTURE

For Lynch (1960), urban form must be identifiable by its unique characteristics. These characteristics will allow individuals and social groups to appropriate it and to give it emotional and affective meaning. Lynch then created the concept of urban forms *imageability*, which corresponds to their ability to provoke an image in the individual and thereby facilitate the creation of collective mental images.
A city with strong imageability allows the observer to perceive it as a strongly continuous structure. A coherent sequence of distinctive objects maintain clear relationships with other objects. Beyond the subjective filters, the morphology, the physical form of the city plays a fundamental role in producing the perceived image. Kevin Lynch's method rests on urban structure map through five constituent types of the urban landscape elements: ways, limits, nodes, landmarks and neighbourhoods or districts (Fig. 3).

SPACE SYNTAX METHOD

Spatial syntax supports decision-making for well-functioning urban designs, enabling the creation of sustainable cities and communities. Through systematic research, spatial syntax consists of a set of theories about the relationships between space, spatial relationships, and society.
Space Syntax theory is based on the elementary principles of centrality, extension, contiguity and compactness. Since these spatial principles deal

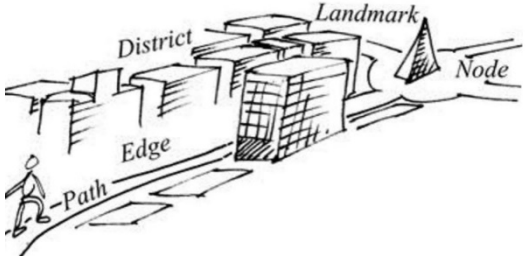

Fig. 3 - Schematic Lynch's quintuple elements (source of https://semanurcan.wordpress.com/2019/10/27/the-city-image-and-its-elements-by-kevin-lynch/)

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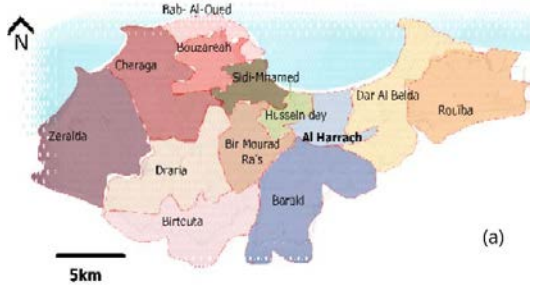
with the spatial aspects of the built environment, human intention, meaning or memories are not considered (Hillier, 1996). To overcome this gap, both phenomenological (cognitive), structural and sociological tools complemented this approach.

THE CASE OF AL HARRACH MARGINALISED DISTRICT

Al-Harrach is the 18th district of Algiers. It is located 12 km east of the city centre of the Algerian capital. Its former name was Bordj Agha or Maison-Carrée, now the Municipal Centre of Al-Harrach. This city is located along the North-South axis, which is composed of the Industrial communes of Oued Smar and Eucalyptus and those bordered by Oued Al Harrach (or Al Harrach River from which it takes its name). It is located in the North, with the railway in the South up to the section of railway tracks, at the level of Lakhdaria. The RN 38 bound the city to the east as far as Oued Al Harrach and to the south, as far as the intersection with the southern ring road. The route runs along the ring road to Oued Smar, to the limit of the barracks, to encompass it to CW 118. The prison represents the limit at the crossroads of Belfort, then towards the East until the crossing of the RN 5 (Figs. 4 and 5).

Some writers say that Al Harrach is older than Algiers and some call it "Old Algiers" (Marmol, 1571). When the French occupants arrived, the land surrounding the Fort was vast swamps. The French later gave the village the name of Maison-Carrée. Farms were created. Cardinal Lavigerie founded an orphanage nearby as well as the *Maison des Missions Africaines*, the monastery of



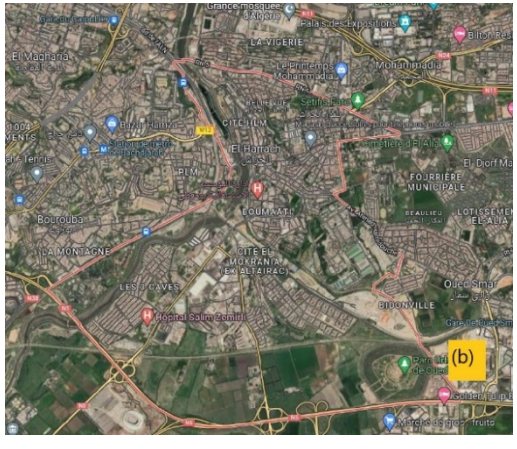


Fig. 4 – (a) Situation of Al Harrach district in Al-Djazair city (Students group, 2020) and (b) Al Harrach map courtesy Google Maps.

a)

b)

c)

d)

Fig. 5- Presentation of Al-Harrach district: a) municipality; b) railway; c) Oued al Harrach; c) the bridge

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Table 2. Different perceived emotions.

Genesis				
Lost mind	Contradiction	Ambiguity	El-Harrach The Damaged	Belonging and well-being
Fear that causes a balance with a hand that asks for help.	The foetus represents belonging but also curling up on oneself. A depression metaphor	The tree representing the centre of life that is the living space.	Colours represent the joy, which makes a contrast between the black, which expresses the fear.	The reflection represents the other state of the destroyed city
How to solve the problem of inequity to give a certain quality to Al Harrach district?				

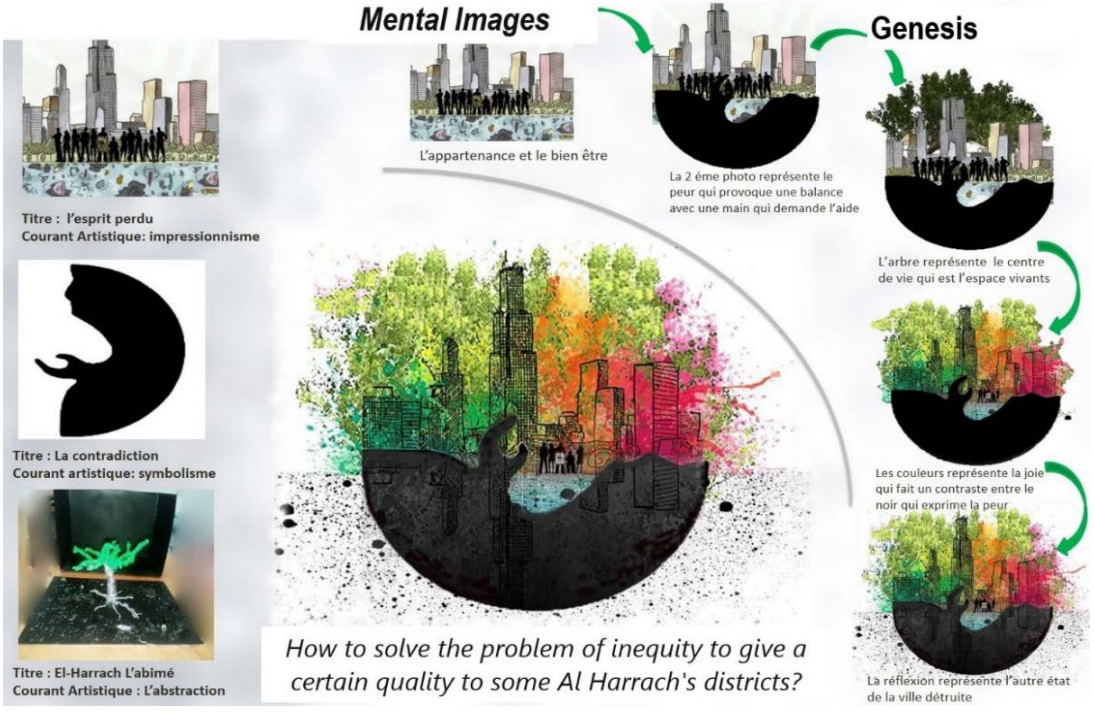

Fig. 6- Mental image Al-Harrach district. See table 2 (Students group and supervisors, 2020).

Saint Joseph, and the motherhouse of the "missionaries of Africa" the White Fathers. The aim was to initiate an ethical change from Islam to Christianism.

In 1842, the city passed from the statute of simple agglomeration to that of the commune and as of 1850, the first industrial structures were established (*Briquetterie Altairac*). Others followed and settled along the banks of the Oued. In 1862, an important cattle market contributed to the enrichment of the merchants of the city. In 1869, an imperial decree renamed the commune of *Rssassa* (*Fort de l'Eau, Aïn-Taya, Rouiba, Matifou*) with the name of its capital: Maison-Carrée. Crossed by the Oued, the district was flooded several times and the deadliest floods were those of 1911, 1916, 1930, 1931 and 1936.

In May 2016, a Master Plan for Development and Urbanism (PDAU) was created to plan the capital. It will be a legal and mandatory instrument for spatial planning and urban management by 2035 (Bachar, 2016). Except for the development of Oued Al Harrach and the central station project in the Baraki/Al Harrach hub, these projects are generally located to the west of the city. Thus, they could reinforce the disparities with the southeastern peripheries. The undertaken changes to the east of the city, such as the development and depollution of Oued Al Harrach and the new Bab Ezzouar business centre are supposed to enhance this part of the city and contribute to its urban integration. The question is whether social integration followed.

A certitude is that the authoritarian and segregated nature of urban and housing policies represents an essential vector of resentment within societies.

In reality, since 2000, the arrival of populations with higher incomes has resulted in the multiplication of one-piece constructions of opulent villas

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contrasting with the existing ones while this town is previously home to a majority of social groups with modest incomes (Semmoud, 2015).

RESULTS OF THE THREE ANALYTICAL METHODS.

MENTAL IMAGE

The students visited the place for the first time. They were asked to individually drawing their impressions. They used different artistic trends. A data show was organized allowing them expressing themselves but also to help them grasp their feelings more clearly and find the right words thanks to a collective dialogue. They created the following mental image using their individual ones (Fig. 6). Colours, words and metaphors help them to translate their emotions.

Largely, the students perceived the degraded state of the district. The mental images and the words used to express the different perceived emotions are summarized in Table 2.

They illustrated the inequity value by contradiction, the need of help, and their sense of loss. The detected problem was *how to solve the problem of inequity to give a certain quality to Al Harrach city?*

AL-HARRACH DISTRICT'S URBAN STRUCTURE MAP

The second step was to realize the structural layout. This phase was more complicated. Students had to read Lynch's book *The image of the city* (1960). Then, they created a table to define the different variables and how they should be materialized on the ground.

The results showed several problems. They are mainly situated on the riverbanks: inundating, noise and smell pollutions, anarchic road network (unstructured), and lack of legibility, traffic jams, and undeveloped spaces. The two riverbanks are

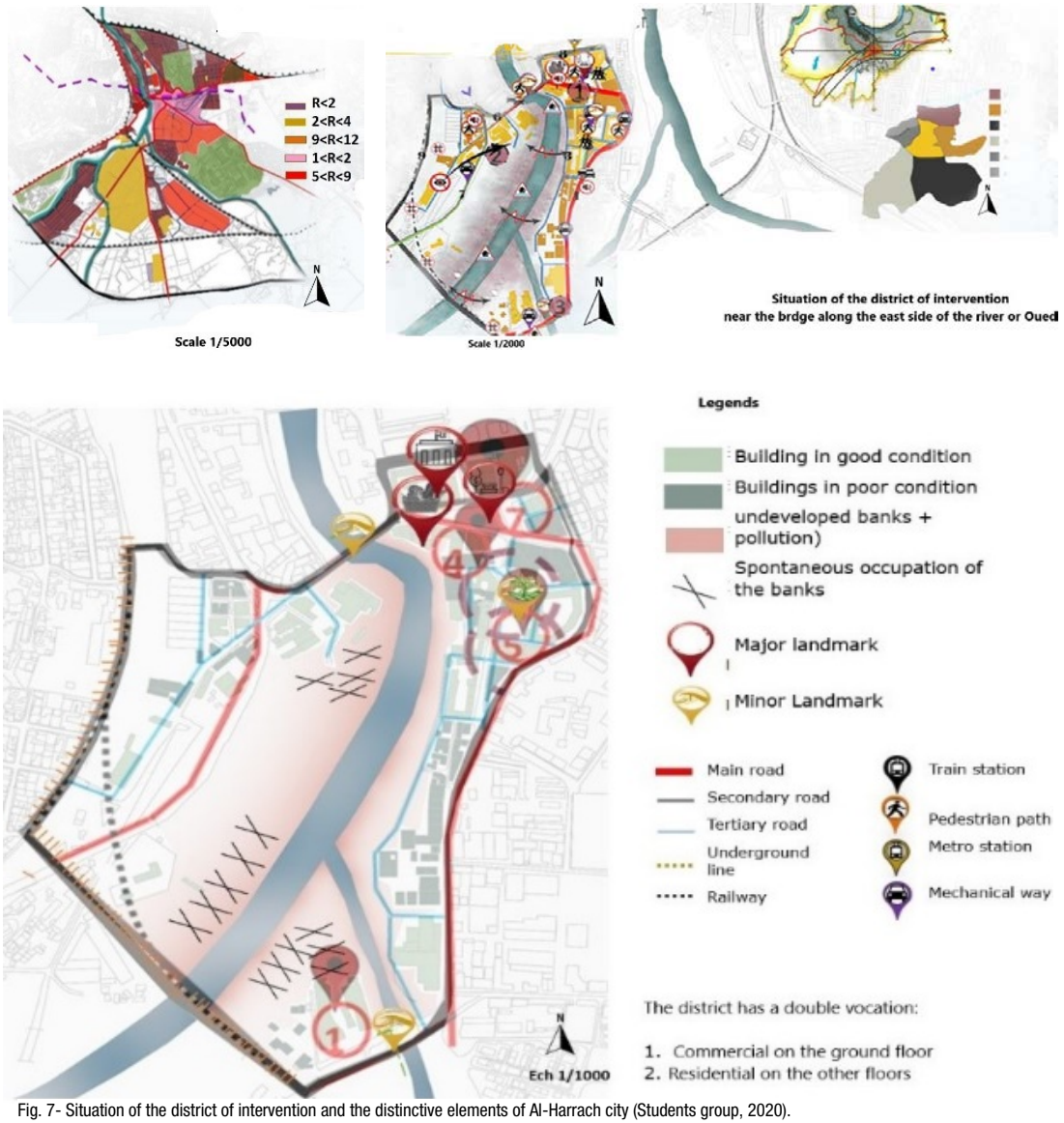

Fig. 7- Situation of the district of intervention and the distinctive elements of Al-Harrach city (Students group, 2020).

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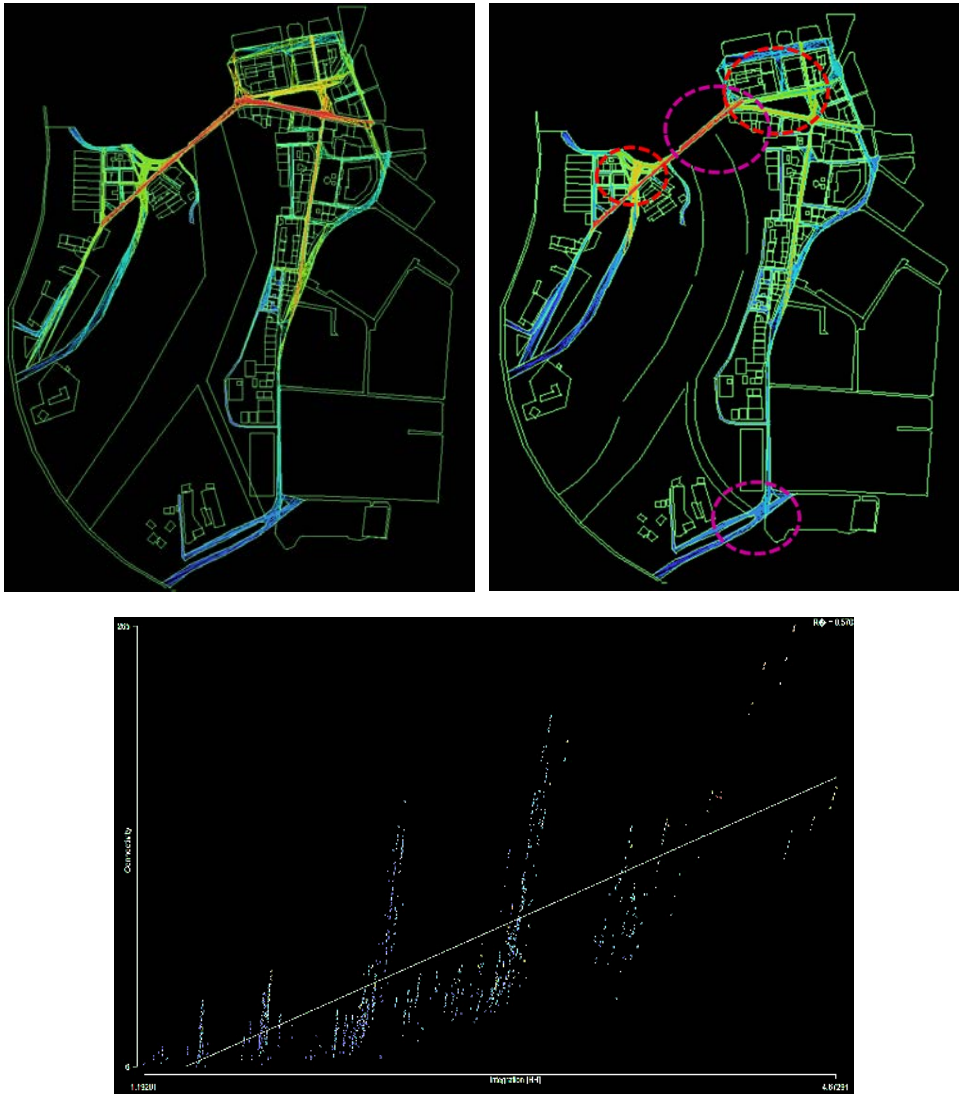

Fig. 8- District's axial maps: 1. Connectivity map. 2. Map of integration. 3. Intelligibility score. R2= 0.57>0.50 (Students group, 2020).

broken through the imbalance in the distribution of nodes, landmarks and activities, which creates a concentration and densification, on only east side. On the west side of the district, there is a lack of public spaces that can ensure social exchange and a lack of equipment for different functions that allow social needs (educational-cultural-commercial-housing, etc.

We can observe a morphological rupture with a dense centre and a sparse periphery. A clear break between the two banks is visible. A single bridge links the two shores. They lack urban development.

Figure 7 displays the distinctive structural elements of Al-Harrach selected district.

DISTRICT'S AXIAL MAPS

The axial map of the city superimposed on the structural layout allowed distinguishing the most affected part of the city and thus to choose the district and the intervention's islets.

Students have drawn Al-Harrach map on AutoCAD and used DepthMap10 software (Turner, 2017) to analyse the district's structure of the urban layout. The results show that the most integrated streets are those animated with the different activities: leisure, sport, commerce... as Avenue de 5juillet and the 8 May Bridge. Said Mokrani Street is the transition space with medium flow. The 8 May Bridge is the deepest and the closest to the connected area (presence of nodes and landmarks). On the other hand, the roads in the eastern part are the least connected and the deepest in the system. The Oued banks are highly segregated and thus poorly accessible (Fig. 8).

The high level of intelligibility of the district allows a good orientation to the inhabitants, in spite of an imbalance in the degree of integration of the ways between North and South (Fig. 8).

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RESULTS: STUDENTS' URBAN PROJECT

OBJECTIVES OF THE STRATEGY

The main objectives of the strategy is restructuring the existing roads and sidewalks by giving them new dimensions and new shapes integrating urban vegetation:

1- Creating a better character in this urban district,
2- Restructuring of the left bank, following the lines of the river (Oued). An arc and its centre are marked. This portion will allow restructuring the road network to make it more permeable.
3- Smoothing the lines of the Oued
4- Restructuring the Right Bank by prolonging the lines of the existing paths and creating the pathways that will accommodate the extended ones.

Figure 9 summarizes the design process through the different geometric schemes.

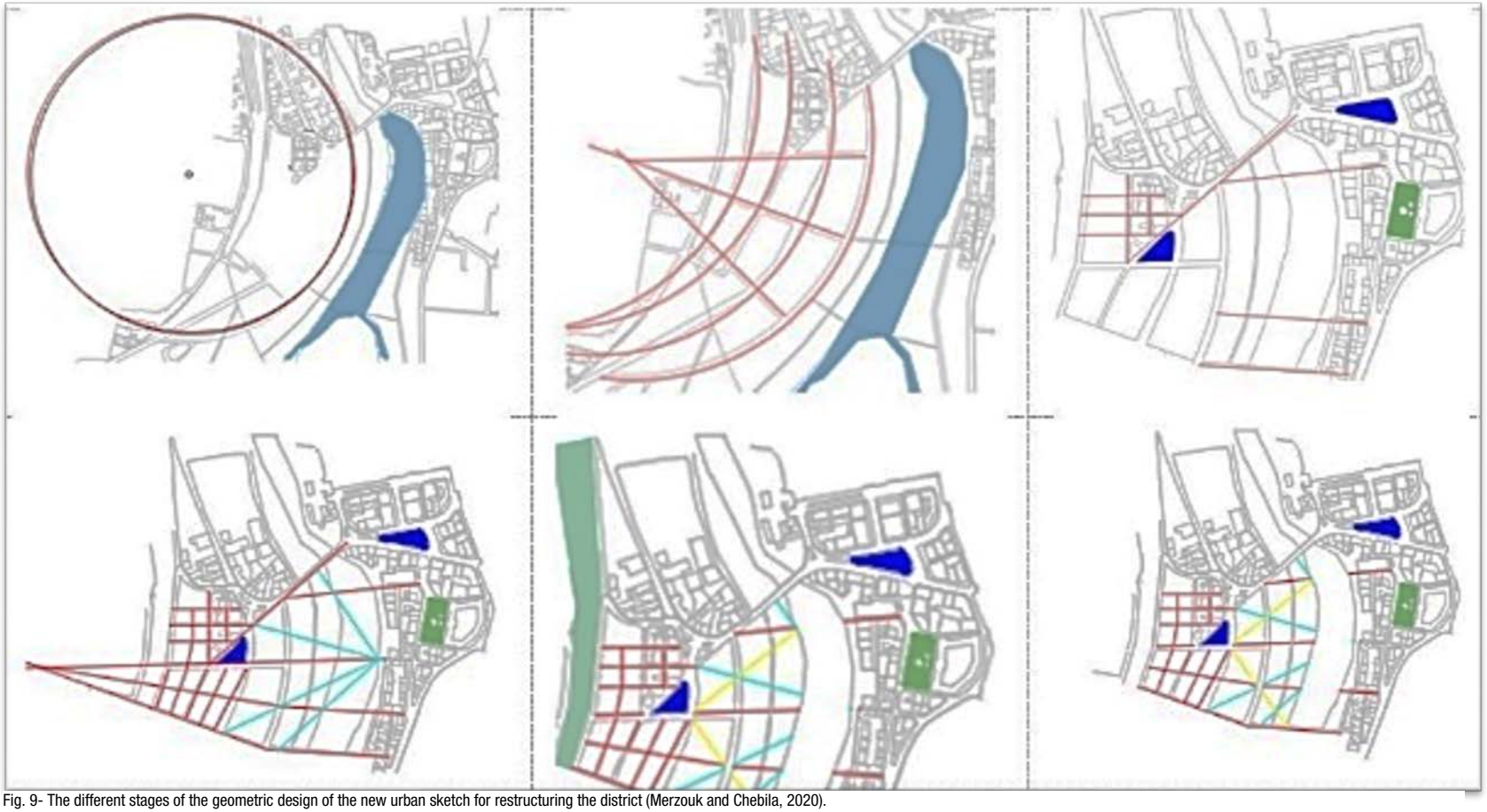

Fig. 9- The different stages of the geometric design of the new urban sketch for restructuring the district (Merzouk and Chebila, 2020).

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Fig. 10 - New urban character of the district (Merzouk, 2020).

THE NEW URBAN PLAN

This urban project created new good urban character in the district (Fig. 10), new pathways, multifunctional public buildings playing the role of new landmarks and nodes (Fig. 11).
The urban principles that guided the design of the project were applied at the level of urban morphology (see Table 2). A video created on Sketchup comes as close as possible to the mental image of the students and allowed to go through the project mentally.
The results show that the integration becomes very good throughout the new district and much more at the level of the major roads (pedestrian way and roads that connect the square to the 3 bridges).
Connectivity score is very high in the neighbourhood for the presence of the square, which becomes a landmark and a major node.

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Fig. 11 - Suggested structure map 1/1000 (Merzouk and Chebila, 2020).

Intelligibility score is $R^2 = 0.82 \rightarrow 0.5$. This higher level improved wayfinding in this area (Fig. 12). This quality is important if we want to attract the public to the other bank. The objective was to create a place where the mix of activities is possible while preserving the intimacy of the introverted designed residential islands with interior courtyards. This specificity responds to the Islamic ethical imperative of preserving the privacy of the inhabitants.

Finally, we asked students to summarise their work on one panel (Fig. 13). This work should summarize the problem, the results achieved by the site's analysis, the urban intervention's objectives, and the actions of the involved strategies, the urban programming and finally the ensued urban project.

The structure of the panel shows the comparison before and after the intervention. The same methods used to analyse the urban site assessed the project.

Fig. 12 – a) Connectivity and b) integration results maps. c) Intelligibility score 0.87 (Merzouk and Chebila, 2020).

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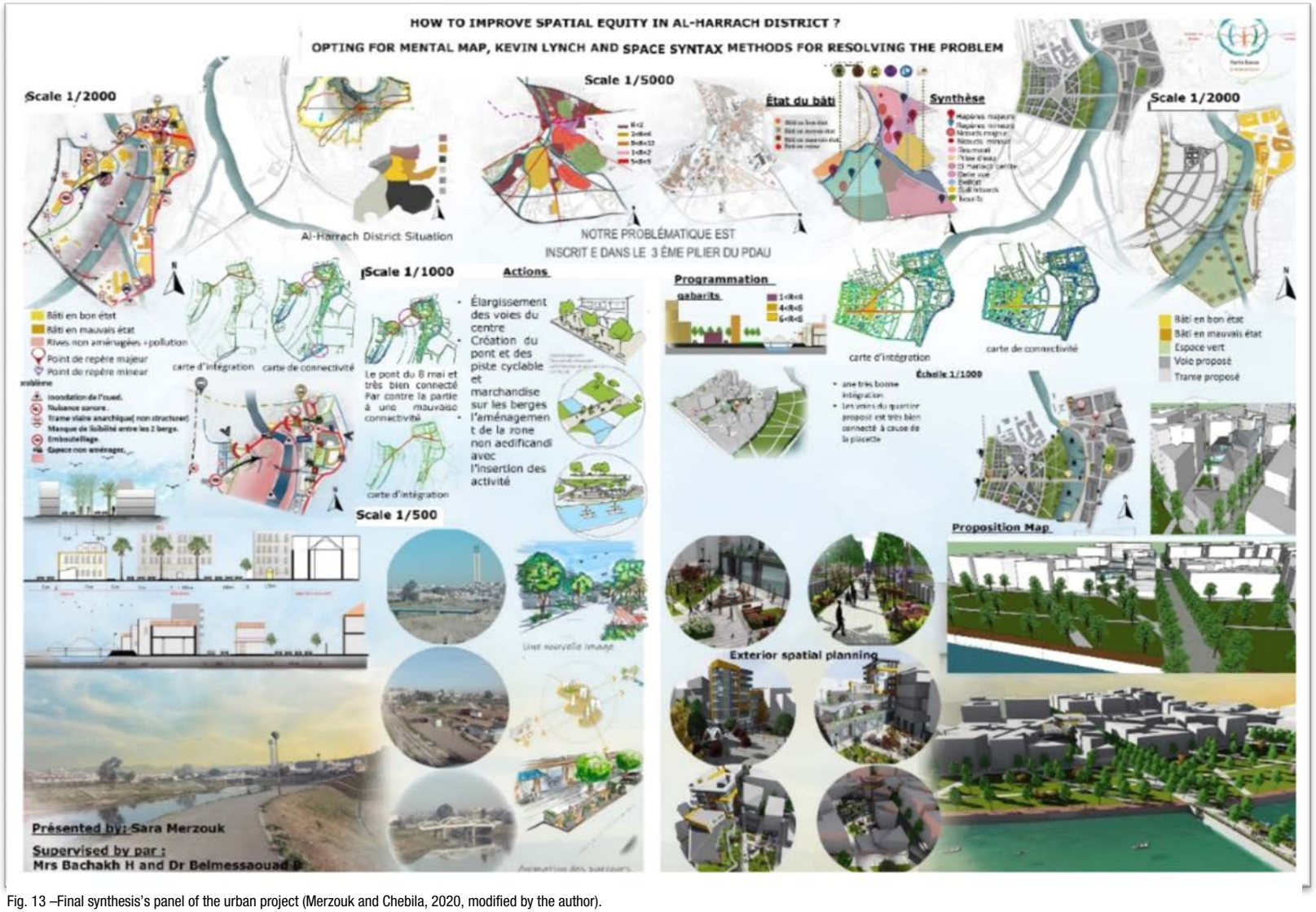

Fig. 13 –Final synthesis's panel of the urban project (Merzouk and Chebila, 2020, modified by the author).

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CONCLUSION

In this paper, we presented a new way of understanding the design of an urban project based on spatial equity. The design studio approach tried to overcome the haphazard approach by combining tools grounded on phenomenology and structuralism. With the techniques inherent to integrating the computer, we were able to design an urban project that concretizes this ethical value. The spatial accessibility, the propensity for social interaction and the good character of spaces mainly define this value. The implementation of such a project may allow verifying these qualities.
This approach allowed highlighting the districts' essential components, providing methods and perspectives for the sectoral analysis and a better understanding of the specificity of the city. We can reproduce this experiment for other cities.
From now on, it becomes essential to analyse the interrelationships between the different components of the urban object. The systemic approach is the only one capable of understanding the functioning of urban space in its complexity. Guided by the understanding of the overall functioning of the urban space, we will be able to make a diagnosis that will open on strategic recommendations for an ethical urban development. The objective of such systemic diagnosis of urban spaces is reproducible for other case studies. Thus, combining scientific approaches allows for covering many human needs. These new relationships between urban societies and physical space encourage the right to the city, spatial equity, and the design of a physical city project as a means of improving civitas. They are signs of a new social cohesion, a sense of ethical contemporary public space and the sustainability of urban development.

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REFERENCES

Adams, J. (1963). Towards an understanding of inequity. *The Journal of Abnormal and Social Psychology*, 67(5), pp.422-436.

Anderson, N., Ishwaran, K. (1965). Urban Sociology. Bombay: Asia Publishing House.

Alexander, Ch. (1979). *The Timeless Way of Building*. Oxford: Oxford University Press.

American Heritage Dictionaries (1982). Third Edition. Boston: Houghton Mifflin.

Aristotle (2002). *Nicomachean Ethics*. (Trad. C. J. Rowe, annoted by S. Broadie). Oxford: Oxford University Press. DOI: 10.1093/actrade/9780198752714.book.1

Bachar, Keira. (2016). Le nouveau PDAU d'Alger approuvé. Études sur la ville. Réalités Urbaines en Algérie et au Maghreb. *RURAL-M*. Lien: https://ruralm.hypotheses.org/972

Bauman, Z. (1993*). Postmodern ethics*. Oxford: Blackwell.

Belmessaoud, B. (2006) Sustainability and Urban Form: Implementing ethical values in sustainable urban design. (Doctoral dissertation). University of Alexandria, Alexandria, Egypt.

Belmessaoud-Boukhalfa, B. (2012). The ethical dimension of Islamic urban architectural heritage as sustainable design. In *7th International Conference on Urban Regeneration and Sustainability*. Wit Transactions on Ecology and the Environment, 155, 917-928.

Belmessaoud-Boukhalfa, B. (2022). Space Syntax Theory Identifies the Ethical Reversal Trend of the Overwhelmed Madina of Al-Djaza'ir Urban Morphology. *Mediterr. Archaeol. Archaeom.* (1)22, 155–182.

Burton, E. (2001). The Compact City and Social Equity. In *Housing, Environment and Sustainability*, Housing Studies Association Spring Conference, University of York.

Chan, J. K. H. (2019). *Urban Ethics in the Anthropocene. The Moral Dimensions of Six Emerging Conditions in Contemporary Urbanism*. University of Technology, Singapore: Palgrave Macmillan.

Dalton, R. and Bafna, S. (2003). The syntactical image of the city: a reciprocal definition of spatial elements and spatial syntaxes. In *4th International Space Syntax Symposium*, 17 June 2003 - 19 June 2003, London.

depthmapX development team. (2017). depthmapX (Version 0.6.0) [Computer software]. Retrieved from https://github.com/SpaceGroupUCL/depthmapX/

Gagne, R. (1985). *The Conditions of Learning (4th Ed.)*. New York: Holt, Rinehart & Winston.

Gilligan, J. (1982). *In a different voice: Psychological theory and women's development*. Cambridge: Harvard University Press.

Harries, K. (2000). *The ethical function of architecture*. Cambridge, Mass: MIT Press.

Hillier, B. (1996). *Space is the Machine*. Cambridge University Press: Cambridge, UK.

Jacobs, J. (1984). *Cities and the Wealth of Nations: Principles of Economic Life*. New York: Random House.

Jacobs, J. (1984). *Cities and the Wealth of Nations: Principles of Economic Life*. New York: Random House.

Jacobs, J. (1993). *Systems of Survival. A Dialogue on the Moral Foundations of Commerce and Politics*. New York: Random House.

Jacobs, J. (2004). *Dark Age Ahead*. New York: Random House.

Lynch, K. (1960). *The image of the city*. Cambridge: MIT Press.
Lynch, K. (1998). Good city form. Cambridge, Mass: MIT Press.

Ma, F. (2020). Spatial equity analysis of urban green space based on spatial design network analysis (sDNA): A case study of central Jinan, China *Sustainable Cities and Society*, 60, art. No. 102256.

Marmol, L. (1571). *Descripción general de África, sus guerras y vicisitudes, desde la fundación del mahometismo hasta el año*, Tome II.

Mc-Harg, I.L. (1969). *Design with Nature*. Garden City, N.Y: Natural History Press.

Mumford, L. (1934). *Technics and Civilization*. UK: Routledge.

Mumford, L. (1940). *Faith for Living*. London: Martin Secker and Warburg.

Newman, P. Kenworthy, J. (1999). *Sustainability and Cities: Overcoming Automobile Dependence*. Washington: Island Press.

Newman, O. (1972*). Defensible space: Crime prevention through urban design*. New York: Macmillan.

Piaget (1950). *Introduction à l'épistémologie génétique*. Paris: PUF.

Piaget, J., & Inhelder, B. (1948). *The child's conception of space*. New York: W. W. Norton.

Plato, (Jowett, B.) (2008). *The Republic*. Charleston: Forgotten Books.

Rich, R. F. (1979). The Pursuit of Knowledge. *Knowledge*, 1(1),6–30. https://doi.org/10.1177/107554707900100102

Saint-Martin, F. (1987). *Sémiologie du langage visuel*. Sillery. Québec: Presses de l'Université du Québec.

Segal, S. Fusella, V. (1970). Influence of imaged pictures and sounds on detection of visual and auditory signals», *Journal of Experimental Psychology*, 83(3), 458-464.

Semmoud N. (2015). Les marges urbaines : un analyseur privilégie de l'urbanisme d'Alger ? *Les Cahiers d'EMAM. Politiques urbaines et inégalités en Méditerranée*. <http://emam.revues.org/1091>. <hal-01254640>

Spencer H. (1893). *Justice*. M. E. Castelot (trad.) *Collection :* Collection d'auteurs étrangers contemporains.

Tartag, R. (2016). Interaction ville/piéton dans un site historique, cas de la Casbah d'Alger. (Master Thesis), École Polytechnique d'Architecture et d'Urbanisme, Algiers, Algeria.

Thomas, R. (2003). *Sustainable urban design*. London: Spon Press.

Tsou, K.W.; Hung, Y.T.; Chang, Y.L. (2005). An accessibility-based integrated measure of relative spatial equity in urban public facilities. *Cities*, 22(6), 424–435. https://doi.org/10.1016/j.cities.2005.07.004.

Walster, E., Berscheid, E., & Walster, G. W. (1973). New directions in equity research. *Journal of Personality and Social Psychology, 25*(2), 151–176. https://doi.org/10.1037/h0033967.

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