

“Mural Arts” an Opportunity for Enhancing Cognitive Mapping

With Respect to Cairo

Alaa M. Abdelaziz, Manal Abou ElEla, Ayman F. Wanas

Abstract— Many cities are becoming referred to as being grey due to a variety of factors from which are pollution, urban sprawling, lack of sufficient infrastructure and many more. Cairo, Egypt is one of those cities where most of its informal settlements are indistinguishable and illegible. The main aim of this paper is to study the viability of urban art on enhancing the cognitive map of these areas and hence the Grey Cities. This paper is an attempt to explore urban art, specifically street art, and cognitive mapping to find if they have a relationship that might be beneficial to urban design. To be able to investigate the intended relation in an objective manner, a qualitative-quantitative approach has been adopted. Secondary data was gathered through desk study. Primary data was collected through structured interviews and field observations. This paper confirms the correlation between street art and cognitive mapping. As well as highlighting the proven significant recalling factors applicable to street art to attain this relation.

Index Terms— Grey Cities, Urban Art, Legibility, Cognitive Mapping, Public Art, Street Art Pieces, Informal Settlements.

1 INTRODUCTION

ACCORDING to Kevin Lynch “We must consider not just the city as a thing in itself, but the city being perceived by its inhabitants.” [1] The depressing environment that has dominated cities by being overcrowded, polluted and inhumane has helped in withdrawing its legibility as well as negatively affecting the communities both physically and psychologically [2]. As having a legible environment represents an important factor in offering security and enhancing the intensity of experiencing the spaces, the lack of it in many cities causes communal alienation from the surroundings [1]

Environmental psychologists recognize that “Our surroundings influence not only the way we think but our intellectual development.” [3]. Many initiatives have emerged aiming at beautifying the cities and improving how it is acknowledged. Examples of local and international organizations and artists that adopted this aim are Inside Out project, HAAS&HAHN, Mashrou Elsaada, Coloring a Grey City, Hanlawenha and Takween. All of these organizations have the same passion and target, which is enhancing the imageability of cities as well as turning them into cheerful and motivating places. The aim of the study is investigating the viability of urban art on enhancing the cognitive map of Grey Cities. To achieve this aim the paper adopts a qualitative-quantitative methodology that analyses the legibility of selected areas in Cairo and to what extent urban art could affect enhancing the cognitive mapping of such spaces.

- Alaa Abdelaziz, currently pursuing masters degree program in architecture engineering in Arab Academy for Science, Technology and Maritime Transport, Cairo, Egypt. E-mail: alaa_abdelaziz@hotmail.com
- Manal A.S Abou EL-Ela, Associate Professor, Department of Architecture, Faculty of Engineering Shoubra, Benha University (Arab Academy for Science, Technology and Maritime Transport Currently).
- Ayman Wanas, Professor, Department of Architecture, Faculty of Engineering, Arab Academy for Science, Technology and Maritime Transport.

2 GREY CITIES

Grey Cities are being defined as areas that lack clear and defined characteristics, which add an identity to the place [2]. If a city is not planned for, properly controlled or governed it leads no doubt to the society’s chaotic behavior and be the source of its illness further on. Although Grey Cities are mostly characterized by it chaos, it has dual identities; one that drives the economy, creates wealth, enhance the social behavior and provide employment, while the other is the upbringing atmosphere for poverty, environmental degradation and discrimination [4].

Urban growth is one of the main reasons that are behind the term “Grey Cities” as it might cause the disturbance of the city’s harmonious environment; socially, spatially and environmentally. As developing countries are gaining an average of 5 million residents monthly, they are mostly what commonly referred to as being Grey [2]. Grey cities are generally described as noisy, congested, polluted, frustrating, and unhealthy [5]. Having a city referred to as being Grey, whether in developing or developed countries, they almost have the same characteristics. Fig. 1 shows a sample of different countries that are referred to as being Grey.

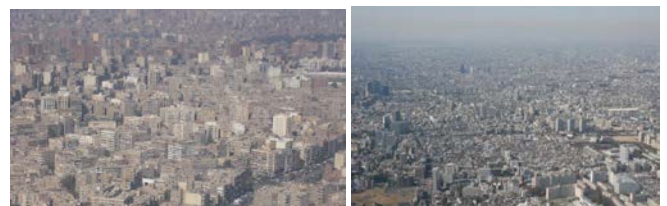


Fig. 1 Different Countries that are referred to as being a “Grey City”, from left to right, Egypt and England

Informal settlements in cities, which are a result of urban sprawl, lead to the overuse of resources. Cities will rapidly

lose their ability to provide a comfortable and healthy living environment to their inhabitants. The ability to produce the basic needs to sustain life will be a privilege that only the well off could take advantage of. Classifying grey cities could be done through the evaluation of three aspects Spatial, Social and Environmental aspects [4]. Cities referred to as being grey often tend to suffer lack of social and spatial harmonies as well as facing environmental deficiencies [2].

Cairo is one of the dominant cities that are referred to as a “Grey City” [6]. The grey color of pollution or, in some cases, the color of bricks of an unfinished building that covers its sky and streets give it a great sense of depression and incompleteness [7]. This, in addition to having most of the informal settlements in Egypt being indistinguishable, adds on to the perception of being a Grey City. Informal settlements accommodate more than 60% of Cairo’s population in an unfinished red brick and concrete buildings [2], [6], which participates greatly in perceiving the city as an assembly of indistinctive and unmemorable urban areas that has neither character nor identity.

Slums are defined as areas that are lacking one or more of the basic conditions of decent housing: adequate sanitation, improved water supply, durable housing or adequate living space [8]. Most informal settlements and slums share a lot of similarities (Fig. 2).

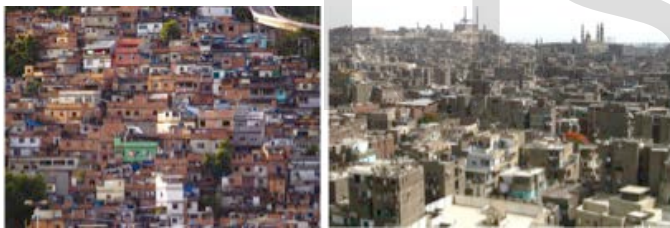


Fig. 2 Examples in both Egypt and Brazil of what is referred to as “Slums”

In the Egyptian context the term ashwa’iyyat has been used to identify the urban informal settlements that have developed without adherence to any urban planning or building regulations to accommodate the rapid rate of urban growth [9].

Slums are generally classified into four types as the following:

“Type A”: Informal Settlements on Former: Agricultural Land

“Type B”: Informal Areas on Former Desert: State Land

“Type C”: Deteriorated Historic Core

“Type D”: Deteriorated Urban Pockets

By far the most dominant types of slums in Cairo are Types A and B as shown below in (Table 1) [10]. The average inhabitants of these areas are 500 people per feddan in buildings of an average height of 5 floors. The basic utilities are the only thing that these areas might be in the privilege of, along with what might be called safe housing.

TABLE 1
GREATER CAIRO SLUM TYPES AND ESTIMATES OF PREVALENCE IN 1996

Typology	Population	% of total GC population	% of total GC residential area
Type A Informal Settlements on Former Agricultural Land	6,434,000	56.4%	46.1%
Type B Informal Settlements on Former Desert State Land	6,434,000	56.4%	46.1%
Type C Deteriorated Historic Core	n.a.	> 4%	n.a.
Type D Deteriorated Urban Pockets	n.a.	> 1%	n.a.

Cairo is a city of major contrasts, from the greatness of the pyramids or Islamic Cairo to the poor structures, infrastructure, pollution, and crowdedness of the informal settlements that could not be ignored. As these struggles kept being overlooked, Cairo became unfortunately perceived as a frustrating and a grey place to be [11].

To enhance the urban environment of a city the non-physical factors must be addressed as well as the physical ones. Taking into consideration the city’s culture, heritage, sense of place and social connections are what could help elevate the state of a city as these non-physical assets are considered the “soul of a city”. Improving the condition of existing informal settlements whether physically, socially or environmentally, with the help of its residents, is a crucial process. Many approaches have been undertaken towards the enhancement of slums, from which are the relocation of inhabitants, the restoration of structures, improving the infrastructure and lately the most commonly used, due to its less cost and shorter implementation period, is the use of creative Urban Art. As the society is becoming more aware of the importance of colors in their daily lives and how it might affect their personalities, creative movements have been founded to enhance the quality of life and the image of the city through the beautification of the informal settlements without subjecting the residents to radical changes during the process.

Opportunities to enhance the urban life and the image of developing countries are a priority to be explored. The process of cognitive mapping is going to be briefly addressed along with the factors that indicate the legibility of cities in order to measure the viability of urban art on enhancing the image of informal settlements in Cairo.

3 COGNITIVE MAPPING

Architects Serge Chermayeff and Christopher Alexander in 1977 described what the cities have been going through from the spatial expansion during the 19th and 20th century as “modern space salad” [12]. The chaos that have taken over most of the cities to accommodate the huge population growth

led to the mixture of different structures, forms, sizes, functions and architectural styles. The resulted contradictory features of a city led to the illegibility and distortion of their cognitive mapping [13].

A cognitive map is defined as long-term stored information about the relative location of objects and phenomena in the everyday physical environment [1]. They are generally assumed to be incomplete, distorted, mixed-metric representations of real-world environments. They can also be maps of the imaginary environments. To perform such tasks it is necessary to use one's memory representations of spatial information, where having spaces with distinctive and unique features make it easier for the observers to conduct a clearer cognitive map of the space [14].

The term cognitive map was introduced by Edward Chace Tolman; an American psychologist by 1948. Through his theories, Tolman reached a conclusion that both animals and humans tend to trace a shortcutting path from origin to destination based on memorial images and learned paths [14].

Imageability of a city is crucially connected to the visual quality of spaces. In other words, the quality of any city lies within the ability to be identifiable [15]. According to Kevin Lynch in his book "Good City Form" there are different dimensions that contribute in the referring to cities as being good or legible from which are Vitality, Sense, Fit, Accessibility and Control. Sense is the degree of fit between the physical city and the way people recognize and organize it mentally, hence it is the most relevant element to the aim of the study.

Sense of a city is categorized into the following elements [15]:

1. Identity: Characteristics that allow users to differentiate one space from another. It enhances the ability of recognizing an environment.
2. Structure: It is how the object is placed in the space considering its relation to the observer and to other objects.
3. Meaning: It is a hidden character of the object and the deepen sense that reflects the importance of the object. A particular city may stands for enjoyment, power, vitality, mystery or something else presented in mental image of its inhabitants.
4. Congruence: It is the relationship of the form to its function.
5. Transparency (Immediacy): degree of visibility of process occurring in the place to users.
6. Legibility: It is the ease with which city parts can be recognized and organized into a coherent pattern. Visual sensations of color, motion, smell, touch and sound...etc, are all cues of orientation that reinforce legibility.

As clarified by Kevin Lynch, "It is that quality in a physical object which gives it a higher probability of evoking a strong image in any given observer" [1]. The quality of those physical

features depends on three factors, which are the shape, color and arrangement of elements in spaces. These factors determine if the image of a certain city is recognizable and of a strong identity or not.

A good city image, which is clear and vivid to the observer, not only gives a sense of emotional security but also elevates the sense of belonging. Lynch classified the elements of a city image into Paths, Districts, Nodes, Landmarks and Edges. To enhance the experience of the inhabitants, these elements must be considered [1].

Many pioneers addressed cognitive mapping from different aspects such as Edward Chace Tolman (1948) [16], Kevin Lynch (1960) [1], Donald Appleyard (1969) [17], Roger M. Downs and David Stea (1973) [18], Jonathan Raban (1975) [19] and many more. This paper is focusing on Donald Appleyard's approach, which examined recognition through multiple measurable factors that were proven solid. This Approach could be tailored to fit our purpose to study the relation between street art and recognition. In addition to clarifying which recalling factors are significant to affect and enhance the cognitive mapping of grey cities [17]

Donald Appleyard conducted a verbal study to test the recalling of buildings during 1888 in Orange, California and Ciudad Guayana, Venezuela in 1964. The aim for selecting such different cases was for the results to be generalized and not site specific [17]. Various factors were extracted through comparing expert's judgments along with the subject's verbal descriptions. Those factors were tested for significance and those who proved to be significant were subdivided under the three main attributes as shown below:

TABLE 2
THE PROVEN SIGNIFICANT FACTORS CONCLUDED BY DONALD APPELYARD IN HIS "RECALLING THEORY" OF BUILDING FACADES (AUTHOR)

Donald Appleyard's Recalling Theory												
Form	Movement around building	Contour Clarity	Size	Shape	Complexity	Color	Surface Texture	Maintenance Quality	Signage	Visibility	No. Of Viewers/Passers By	Proximity of building to orientation point
Symbolism	Centrality to Circulation Sys.		Function Uniqueness		Symbolism							

Appleyard's findings indicate good stability and generalizability in the attributes selected. For further investigation for Appleyard's results, researchers derived five more characteristics from the research on environmental assessment by Stephen Kaplan (1973) to be assessed against Appleyard's factors. These characteristics are complexity, naturalness, mystery, coherence and spaciousness. Through studying the significance factor of each of the variables, it clarifies that complexity and naturalness are significantly correlated to recalling of buildings. On the other hand mystery, coherence and spaciousness had variance in their

ratings, which proves they have no relation to recalling of buildings [20].

Comparing both studies, it could be concluded that a human has the ability to recall buildings through the significance of specific features it holds. And by taking into consideration those factors while designing, a building would have the ability to affect the imageability of viewers despite its site settings. For this reason those factors could be used as an assessment factors to measure the imageability of physical features within any space.

To achieve the aim of our study, the impact of urban art on enhancing cognitive mapping of grey cities, the above factors will be utilized. The factors will be used as testing measurement of the selected urban tool as shown in the table 3 below:

TABLE 3

MEASURABLE FACTORS TO TEST URBAN ART FOR BEING RECALLED BASED ON BOTH APPLEYARD'S AND KAPLAN'S TESTED FACTORS (AUTHOR)

Recalling Factors										
Form	Contour Clarity	Size	Shape	Complexity	Color	Surface Texture	Maintenance Quality	Visibility	Centrality to Circulation	Symbolism

Through understanding the factors of a city image and how the quality of physical features is directly related to the legibility of cities, guidelines are extracted. These guidelines will be later used as the framework of selected urban tool against the urban element that this study focuses on which is the edges to investigate the selected case studies. In this direction urban art is going to be investigated.

4 THE ENHANCEMENT OF COGNITIVE MAPPING VIA URBAN ART

The right to inhabit and dwell in a city was termed by Henri Lefebvre as the "The right to the City" [21]. It is the right of the citizens to use, socialize and participate in making their places, and by that they would explore the meaning of living in a city. Both professional artists and the locals are currently using urban art as one of many tools to interact with the city. Urban Art is defined as any work that is exposed to the public from scribbling, sketching and painting. It is usually a temporary work that has emerged from the hassling human activities in the complexity of city on the streets and buildings surfaces. Urban artists take the cities as their main muse to the creativity of their work (Fig. 3).



Fig. 3 Paleolithic art in Cave of Altamira, Spain discovered 1879

Urban Art represents the city. William Whyte constantly encouraged urban designers to have the city viewed as habitats for human beings that has to represent them rather than just a machine. He criticized the ugliness of the urban image and the waste of land that took place. He called for more socially equitable places for the humane metropolis [22].

Accordingly William Whyte and Jane Jacobs criticized the state of urban planning strategies that put such inhumane scale of high-rise structures as a renewal programs for cities. This type of solutions takes away the soul of cities, as expressed by Whyte, "The scale of the projects is uncongenial to the human being". Having no street life and spaces that does not provoke human attachment to, is considered a failure [22].

Visual art and Public art are another terms to express urban art, where they reflect the emergence of open-air galleries as an alternative that was needed to serve the public domain in 1960s [13]. These types of art applied aims primarily on the revitalization process of neglected urban spaces. They take different forms from which are painting, sculpturing, and printmaking [23], [24], [25].

Urban art is considered one of the solutions that when applied to urban spaces, that lack identity, it enhances their livability and gives them unique character. Some urban artist as "Swoon", an American street artist, became famous by 1999 for her life sized figures on any surface to give the people sense of place marking and way finding to guide themselves through the city, (Fig. 4) [26]. Urban art plays an important role in giving spaces different experiences that reveal the daily struggles of life in the city and in the lives of the inhabitants where it makes those places more personal.



Fig. 4 Work of the Street Artist Swoon

As artists are aware of the importance of urban art and how they can affect the society, a project was launched in 2004 by the artist Jean Hester named "Write on this". It aimed at provoking the interaction with the public through placing posters among the walls of public spaces in Lower Manhattan. A question was written on each poster that triggered the public to share their feelings about the place and the surroundings such as the beauty they saw in this particular place, their feeling in that exact moment being present in this location, what would they change about the place and many more. This in her opinion took a priority in changing the culture by spreading the awareness through urban art [26].

Urban art aids as a tool that enhances space recognition, and as the British writer Iain Sinclair stated in his book light out of the territory "Walking is the best way to explore and exploit the city. Drifting purposefully is the recommended mode" [27]. If the public had the opportunity of witnessing art through their streets it would enhance their recognition of urban places as well as beautifying it.

It is said, "An empty wall is an empty population" where it shows that the public must have a voice of their own that is expressed freely through out their city walls [28]. In this direction Artist Cacao Rocks (Fig. 5) clarifies "My work is more like telling a story without trying to change the ideas of the spectators if this is possible. I just want to make them feel other things than just walking by a grey wall in the city" [26].



Fig. 5 Artist Cacao Rocks Street Art work "Deja Vu Fractal", Athens, 2013

Urban Art takes place in different forms and techniques. The most frequent technique employed is stenciling, followed by freehand graffiti and sprayed or painted slogans, proposing a slightly more aggressive stance on reclaiming

space [29]. At this process the built environment becomes a canvas in front of the creativity and the story that needs to be told. Shelley Sacks (2005) defines art as instruments that involve "transactions" between people, issues, and places. Through art people are being expressive and to certain extent territorial, where they restore what is considered private back to the public.

Street art, as one type of urban art, is influenced by the effortlessness of Graffiti during the early 1990s [30]. It is defined as a type of art that takes different forms and purposes from which are form of protest, critique, irony, humor, beauty, subversion, clever prank or all of the above. The difference between street art and graffiti is the legalization of the work applied. Graffiti is mostly an illegal art piece that is done by self-taught artists. On the other hand street art is a permitted action that trained artists seek to carry on overarching messages to the public. Fig. 6 shows the difference between Street Art and Graffiti, where an illegal writing graffiti work attempts to corrupt an elaborately painted mural. But as an artistic way to overcome the tagging, the street artist covered the writing with smiley faces as some sort of Band-Aid.

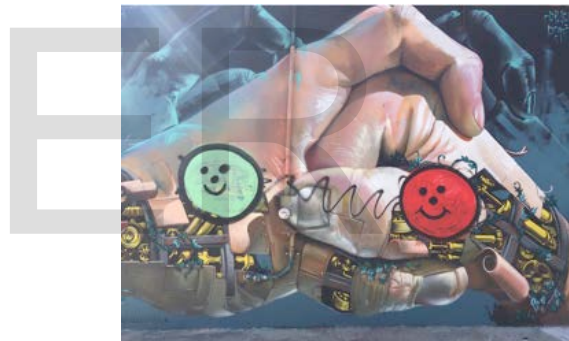


Fig. 6 At the Bushwick Collective, street artists paint smiley faces over graffiti tags on their murals

In 1982 Keith Haring created his first major outdoor mural on the Houston Bowery Wall in New York City (fig. 7). The iconic mural is one of the street art legends most recognizable public works. It is created using his signature style figures and bold colors created in dedication to the rising art scene in the area. In 2008, the Houston Bowery Wall became a permanent outdoor exhibition space.



Fig. 7 Keith Haring - Houston Bowery Wall 1982

Christian Norberg-Schultz (1999) remarks that “the purpose of a piece of art is to retain and convey existential meanings while humans through perception and understanding the symbol, exposes themselves to an act of identification which consequently gives some meaning to their individual existence” [13].

5 METHODOLOGY

The paper adopts a qualitative-quantitative approach to investigate the relation between the cognitive mapping of grey cities and urban art. The empirical study investigates three cases in Cairo, to explore whether the painting initiatives have succeeded to enhance the cognitive image or not. The cases selected are Manshiet Nasser, Kom Ghorab and Darb Saada, where all addressed areas have street art applications and represent informal settlements, which are one of the main contributors in perceiving Cairo as a Grey City. Edges of urban spaces, in form of walls or building façades, were selected to be the focus of the study. The art applications on the selected edges were evaluated relative to the recalling factors deduced from Donald Appleyard and Kaplan’s fieldwork. The investigation took place through structured interviews and field observation documentation to detect the relation between recognition of spaces and the recalling factors concluded from the literature review. This topic was explored using structured interviews where it was more relevant to the selected areas to avoid any misunderstanding or confusion.

6 ANALYSIS AND DISCUSSION

A probabilistic sampling technique was attained, where a random batch of subjects was the target of the study. They were structurally interviewed for the purpose to fulfill a survey. The sample consisted of total of 140 participants, 80 Female (57%) and 60 Male participants (43%). 65 participants of the sample were residents of the selected areas (46.4%). The dominating sample of 95 participants fell in the age group between 25 to 34 years old (68%).

A reliability test was generated to validate the reliability of the survey and sample. The 15 cases of different art pieces underwent the test for the 10 variables in each case. The reliability value conducted was 0.947, which is a high indication of the reliability of the survey and the data.

TABLE 4

NORMALITY TEST RESULT FOR INVESTIGATED FACTORS (AUTHOR)

Variables	Skewness	Kurtosis
Recognition	-.632	-.732
Lines Clarity	-.396	-1.022
Size	-.462	-.766
Shape	-.280	-1.018
Complexity	-.114	-1.208
Color	-.736	-.704

Surface Texture	.158	-.936
Level of Maintenance	-.160	-1.226
Centrality to Circulation	-.402	-.876
Symbolism	-.032	-1.305

Normality test are demonstrated in the form of Skewness and Kurtosis values that describe the data gathered whether it is normally distributed and could be later generalized on a bigger population or not. The normal range of Skewness is -1.0 to 1.0 and Kurtosis is -3.0 to 3.0. All data for both Kurtosis and Skewness values fell within the normal range (Table 4). Through clarifying both reliability and normality of the data gathered, the investigation of the relation between space recognition and street art was tested.

TABLE 5

SPEARMAN'S CORRELATION TEST CLARIFYING THE RELATION BETWEEN RECOGNITION AND ART RECALLING FACTORS (AUTHOR)

	Lines Clarity	Shape	Color	Size	Level of Maintenance	Complexity	Centrality to Circulation	Symbolism	Surface Texture
Spearman's rho	.808**	.793**	.784**	.765**	.722**	.695**	.688**	.531**	.410**
Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	.000	.000	.000	.000
N	140	140	140	140	140	140	140	140	140

This paper is dealing with non-parametric kind of data; a Spearman Correlation test was generated to investigate the aimed relation. A perfect Spearman correlation factor is either +1 or -1, where any near value is an identification of a monotonic relation between both variables.

Table 5 orderly clarifies the high significant relation between most of the art recalling factors and space recognition. The highest recalling factor was “Line Clarity” with significance value of 0.808, this clarifies that the participants had recalled more vividly the location of the art pieces, which had clear and defining lines (Fig. 8). Line clarity was followed in significance by factors of “Art Shape” and “Art Color”, with significance values of 0.793 and 0.784. It was observable that during the survey study people mentally connected the recognition of spaces with art pieces in their own perception with the color, cheerfulness and unblemished shapes the applied pieces fig. 9.



Fig. 8 Art Pieces with Clear Line Definitions (Author)



Fig. 9 Sample of Tested Street Art Pieces (Author)

On the other hand the least significant factors affecting space recognition were the “Surface Texture” with a value of 0.410. Most of the participants did not mind the surface texture of the building façade or the edges that displayed the art. Whether the texture was smooth or rough and how it might affect the over all piece, was an inconsequential factor relative to their own perception in comparison to the other factors.



Fig. 10 Sample of Subjected Art with Surface Texture Variance (Author)

“Art Symbolism” with significance of 0.531 represents one of the least enhancing factors to space recognition. The correlation coefficient clarifies its insignificance but as observed during the fieldwork, participants did not neglect its effect and important addition to the meaning of the art piece.

On the other hand, in their opinion, it did not have the enough importance to impact space recognition solely.



Fig. 11 Sample of the Symbolic Representative Street Art Pieces Tested (Author)

After presenting the personal information of the participants, the data set gathered was tested and analyzed to validate the aim of the paper where it proved its reliability and normality of distribution. Followed by analytical tests for non-parametric data, Spearman’s Correlation test was generated as the main validating test to the topic under investigation. It was used to clarify if there was an existence of a relation between area recognition in a human perception and the street art applied through testing the recalling factors applied in the pieces. The test validated the relation presented with great significance between space recognition and art recalling factors. In other words it confirmed that there is some factors that had direct monotonic relation to space recognition not emphasizing necessarily of the direction of the relation.

7 CONCLUSION

The perception of Cairo as a Grey City has multiple contributors. The uncontrollable formation of informal settlements is one of the main factors to this perception. Through exploring cognitive mapping, the factors that enhance space recognition, and street art, it was proven that the areas with art applications were significantly recognized than others. Furthermore the street art pieces tested clarified that certain spaces were more distinguishable due to particular factors eg: Line Clarity, Shape, and Color.

In comparison with Donald Appleyard’s experiment, there is a resemblance in findings. Although Appleyard’s tested the factors on buildings, both field work proved that line clarity and shape have the highest significance to recognition. As well as both showed that symbolism did not affect the recognition of neither the buildings nor the tested areas.

The relation between street art and cognitive mapping was clearly shown through field study. This leads to taking into consideration multiple art recalling factors when using this tool in enhancing space recognition. This makes street art a suitable solution for upgrading the informal settlements. It will enhance their legibility and change the image of the unfinished red brick and concrete buildings that contributes in perceiving the city as a group of indistinctive and unmemorable urban areas.

Future studies could be conducted to address the paper limitations. Another approach could be adopted is selecting non-slum areas that will explore whether the formal settlements have a different perspective to recognition than those of informal settlements, As well as addressing the cultural aspects.

8 REFERENCES

- [1] Lynch, K. (1960). *The Image of the City*. United States of America: MIT Press.
- [2] UN-Habitat. (2008). Slum Cities and Cities with Slums. In U. Habitat, *State Of The World's Cities 2008/2009 Harmonious Cities* (pp. 106-119). USA: Earthscan.
- [3] Popow, W. B. (2013). *A Report on Psychology & Architecture*. Chicago: Grand lodge of Manitoba.
- [4] Awan, A. (2013). Relationship between environment and sustainable economic development: A theoretical approach to environmental problems. *International Journal of Asian Social Science*, 3 (3), 741-761.
- [5] Dekay, M., & O'Brien, M. (2001). Gray City, Green City, New thinking and new settlement patterns can bring about urban sustainability. *Forum for Applied Research and Public Policy*, 16 (2), 19-27.
- [6] Tadamun. (2015, march 15). *Painting Initiatives: Can They Make Egyptian Cities Better*. Retrieved April 10, 2015, from Tadamun: <http://www.tadamun.info/>
- [7] ElSharkawy, D. (2012). Study of the color composition of Cairo sky under the influence of pollution. *Helwan University*.
- [8] *Slums & Informal Settlements*. (n.d.). Retrieved February 28, 2016, from Development Studies, The University of Duplin, Tirinity College: https://www.tcd.ie/Economics/Development_Studies/link.php?id=92
- [9] Unicef. (2013). *Multidimensional child poverty in slums and unplanned areas in Egypt*.
- [10] Sims, D. (2003). *The case of Cairo, Egypt*. Egypt.
- [11] Howeidy, A. (2009). *Cairo's Informal Areas between Urban Challenges and Hidden Potentials, Facts, Voices, Visions*. (R. Kipper, & M. Fischer, Eds.) Cairo: GTZ.
- [12] Alexander, C. (1977). *A Pattern Language: Towns, Buildings, Construction*. United States of America: Oxford university press.
- [13] Szostak, A. J. (2010). The Role of Public Visual Art in Urban Space Recognition. In K. Perusich, *Cognitive Maps*. Poland: InTech.
- [14] Golledge, R. G., & Stimson, R. J. (1997). *Spatial Behavior a Geographic Perspective*. Newyork: Guliford Press.
- [15] Lynch, K. (1981). *Good City Form*. United States of America: MIT Press.
- [16] Tolman, E. C. (1949). *Purposive behavior in animals and men*. United States of America: University of California Press.
- [17] Appleyard, D. (1969). *Why Buildings are Known: A Predictive Tool for Architects and Planners*. California: Institute of Urban and Regional Development.
- [18] Downs, R. M., & Stea, D. (1974). *Image and Environment: Cognitive Mapping and Spatial Behavior*. Transaction Publishers.
- [19] Raban, J. (1974). *Soft City*. The Harvill Press.
- [20] Pezdek, K., Smith, C., & Evans, G. W. (1982). Cognitive Maps and Urban Form. *Journal of the American Planning Association*, 48 (2), 232-243.
- [21] Lefebvre, H. (1968). *Le Droit à la ville [The right to the city]* (2nd ed.). Paris, France: Anthrosop.
- [22] Platt, R. H. (2003). Holly Whyte Visionary for a Humane Metropolis. *Lincoln Institute of Land Policy*, 15 (1), 1-3.
- [23] Miles, M. (1997). *Art, space and the city: public art and urban futures*. Psychology Press.
- [24] Kwon, M. (2004). *One place after another: Site-specific art and locational identity*. MIT Press.
- [25] Rendell, J. (2006). *Art and architecture: a place between*. Chicago: London: IB Tauris.
- [26] Pinder, D. (2005). Arts of urban exploration. *Cultural Geographies*, 12 (4), 383-411.
- [27] Minshull, D. (2011). *The Vintage Book of Walking*. New Zeland: Random House.
- [28] Visconti, L. M., Borghini, S., Anderson, L., & Sherry Jr, J. F. (2010). Street Art, Sweet Art? Reclaiming the "Public" in Public Place. *Journal of consumer research*, 37 (3), 511-529.
- [29] Tulke, J. (2014). Aesthetics of Crisis. Street Art, Austerity Urbanism and the Right to the City. *aestheticsofcrisis*.
- [30] Irvine, M. (2012). The Work on the Street: Street Art and Visual Culture. In B. Sandywell, *The Handbook of Visual Culture* (pp. 235-278). Newyork: Georgetown University.