

IN PURSUIT OF COMPATIBILITY AS A FUNCTION OF VISUAL CONTINUITY WITH REFERENCE TO THE GROUND RIBBON IN URBAN SPACES

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ABSTRACT

There has been a growing public dissatisfaction with the visual impact of the built environment in the local Cairene context in the past few decades. There is a quite difference between public taste and the professional scale of measurement. It is argued that this dissatisfaction is a result of the lack of empirical studies that validate urban design controls.

The aim of this paper is to verify local contexts' visual compatibility levels. A survey is conducted in two different local districts exploring the architectural features leading to visual compatibility from the perspective of the professionals on one hand and the laymen on the other. The compatibility ratings were analyzed by Regression. The results outline factors affecting the visual compatibility in Cairo, highlighting non-homogeneous facades, testing and evaluating the different architectural features and physical attributes which replicate or contrast with the facades. These outcomes may help overcome the problems we are facing nowadays in streets and residential compounds where architects and urban designers dismiss public taste in the design of local urban environments.

KEYWORDS: visual continuity, architectural features, physical attributes.

1- INTRODUCTION

Contextual compatibility has received intensive attention throughout the last few decades due to a great dissatisfaction with the visual impact of the local Cairene built environment. Yet many theorists had tried to solve this problem by suggesting conceptual frameworks for specifying physical features that are relevant to contextual fit. Harrison and Howard (1980), considered the physical components of the environment necessary to evoke strong images to observers. They outlined several important aspects of the physical components including shape, pattern, form, color, size, material, and design that evoke different visual imaging and referencing [1,2]. Also Stamps (1995), presented a method to validate contextual urban design principles as a design control. In his study, Stamps identified two reference design variables: scale and character, according to which a new building could be matched with a group of older ones [3, 4].

The approach outlined by Linda Groat, is discussing and investigating a wide range of design factors, not only the façade components as stated by other theorists. In her studies in (1983), she

specified space, massing and style (defined interchangeably as site organization, mass and façade features). Moreover in (1988), Groat investigated the design attributes of contextual compatibility; she found that the façade components had the strongest effect on compatibility judgment [1, 5].

There are scholars who investigated the contextual compatibility through physical attributes only such as Bentley and Stamps. Yet others with Groat, such as Kevin Lynch, and Gordon Cullen had investigated the compatibility in a different perspective, [6,7,8,9 and 10], then categorizing the contextual compatibility into three types (compatibility as a function of visual continuity, compatibility through deeper levels of meaning and association, compatibility as a reflection of history) [4] - it is the variety of ways that compatibility may actually be interpreted - It is worth saying that this paper will concentrate on compatibility as a function of visual continuity.

Accordingly in order to investigate the visual compatibility, this will be done through a survey that focuses on two different local districts, El Korba district and Fatimid Cairo, asking about different physical attributes, patterns, and urban

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features through the analysis of guided questionnaires with frequent users and laymen, investigating mainly the ground ribbon referring to shops' facades.

1-1- SITE ORGANIZATION

Linda Groat had mentioned this aspect in some studies as "space" and other studies as "site organization" defined interchangeably as "site arrangement"; site organization has to do with the basic spatial pattern that a building imposes on the site. Tactics such as setback distances, landscaping patterns, and circulation pathways contribute to the definition of this spatial pattern [4].

One of the terms related to site organization is the "orderliness", and though orderliness in the terms has not been a central conceptual and empirical issue in environmental psychology, but it has formed one of the major underlying assumptions in the development of the concept of place [2] and especially this spatial pattern called site organization.

1-2- MASS

The massing of a building is its volumetric composition, defined in terms of design attributes such as height, shape, and complexity of overall form [5]. It is one of the main components of the design strategy, related with some categories of design characteristics which are essential in any context such as block, building form, and building treatment.

1-3- FACADE FEATURES

Facade design or Façade accentuation as stated in some reviews is used to mean the surface treatment of the planes (the elevations) that define the shell of the buildings [5]. Manipulation of the facade is rendered not only through such stylistic tactics as motifs, but also through more abstract features such as the proportioning of window openings or the use of color and materials.

By suggesting that these three components of design strategy have architectural analyses, the important aspect of these architectural analyses is the extent to which the organization of this conceptual framework may be pertinent to identification of key features. For example, Brolin's argument suggests that most of the key design features would have to do with (style); whereas Cavaglieri's opinion suggests the opposite [4]. This however refers to the (style) or (façade design) component as a

prominent aspect of these components having a great relation to physical attributes and key design features such as materials, windows, color, ...etc.

1-4- COMPATIBILITY AS A FUNCTION OF VISUAL CONTINUITY

Visual continuity can be perceived through different elements in urban context, elements of the city as stated by Kevin Lynch are taken in consideration; paths, edges, districts, nodes, and landmarks. Visual continuity is perceived with the help of paths which are the channels along which the observer customarily, occasionally, or potentially moves. They may be streets, walkways, transit lines, canals, railroads. For many people, these are the predominant elements in their image. People observe the context while moving through it, and along these paths the other environmental elements are arranged and related [8].

On the other hand the edges are the boundaries between 2 places, they are not considered as paths or linear elements to the observer but on the contrary they break the visual continuity: such as edges of development and walls. Such edges may be barriers, more or less penetrable, which close one region off from another, or lines along which two regions are related and joined together. However many architects can use natural edges in urban context as a stimuli for the visual continuity not breaking it, especially when they are shores or railroad cuts. These edge elements, although probably not as dominant as paths, are for many people important organizing features in the context [8].

In a study in 1988, Groat investigated the design attributes of contextual compatibility. She found that the façade components had the strongest effect on compatibility judgment. Also Groat had specified space, massing and style in an earlier study in 1983, as aspects of design strategy according to which architects may fit the new to the old; In another study on preferences for residential façades, Stamps 1999 identified three factors of architectural façades: surface complexity, silhouette complexity, and façade articulation, are important also within the components of design strategy, so visual continuity can be investigated through the façade components as well.

2- RESEARCH PROBLEM

Certainly the designer has a great challenge to find out and create well suited Architecture or






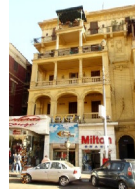

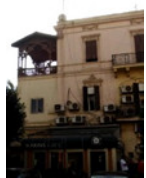
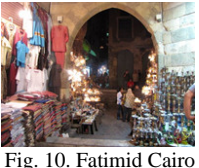


contextually compatible Architecture. Lately, most architects don't put the concept of contextual architecture in consideration; they don't observe the surroundings when designing new shops' facades. Thus certain designs transcend their surroundings and in turn, create their own context, considered as a problem in some residential and commercial sites nowadays, then by result local contexts and urban spaces lack visual compatibility, character, and their own style, consequently they lack the feeling of place as well as the identity.

Yet one can see conflict between the ground ribbon referring to the shops' facades and the building above, shops under residential buildings have different colors, materials and proportions than the

building above leading to non-homogeneous facades, as indicated below in table (1), some pictures referring to several observations showing the **research main problem** which states that although Architects are aware of the visual compatibility in urban spaces, there is a lack of a tangible analysis for assessing and evaluating visual compatibility in different Cairene settings.

It is worth to say that although the norm is to investigate all types of compatibility; the environmental, physical, cultural, conceptual, and perceptual compatibility, but the paper will concentrate on the perceptual compatibility known as visual compatibility, for being the easiest to the laymen and the most influential to the experts.

Table 1- several observations indicate the research problem

<p>Inconvenient Context Conflict between the ground ribbon and the building above</p>	 <p>Fig. 1- El korba district</p>	 <p>Fig. 2- Nasr City district</p>	 <p>Fig. 3- El korba district</p>	
<p>Convenient Context Complement between the ground ribbon and the building above</p>	 <p>Fig. 4- El korba district</p>	 <p>Fig. 5- El korba district</p>	 <p>Fig. 6- El korba district</p>	
	 <p>Fig. 7- El korba district</p>	 <p>Fig. 8- El korba</p>	 <p>Fig. 9- El korba</p>	 <p>Fig. 10- Fatimid Cairo</p>
	 <p>Fig. 11- Fatimid Cairo</p>	 <p>Fig. 12- Fatimid Cairo</p>	 <p>Fig. 13- Fatimid Cairo</p>	

3-HYPOTHESIS

Since this study aims at exploring the relationships between attributes of contextual compatibility on one hand, these attributes are three major attributes, dividing into minor ones; (**Site Arrangement**: size, composite fittingness, height, **Mass**: shape, volume, scale, **Façade Features**: color, texture, materials, style, openings, overall details) and

studying visual compatibility in contemporary regions on the other hand.

Then the **research hypothesis** is if a tangible analytical framework containing physical as well as perceptual parameters has been formulated and assessed, then an efficient visual compatibility is gained.

4-EMPIRICAL ANALYSIS METHOD

4-1-PARTICIPANTS

As far as this paper is concerned with visual compatibility in contemporary local contexts, compatibility then should be discussed and understood in a practical way, thus a questionnaire is designed for laymen aiming to shed the light on design elements necessary for visual compatibility.

The sample consisted of 100 volunteers, all are laymen, and the sample fulfilled a number of criteria including: unfamiliarity with the selected sites, fitting in a range of age groups, and belonging to various groups representing different social classes such as students, governmental employees, and small business employees.

4-2-STUDY AREAS

Fatimid Cairo as an example of a historical context, and El Korba district as an example of an old traditional and cultural context. These are the selected sites taken for investigation to test and evaluate to what extent there is visual compatibility between shops' facades and the buildings above. It is worth to say that there are many contexts valid for these criteria but due to the study constraints, the research concentrates on these two contexts only.

4-3-STIMULI

The contexts in the photo questionnaire consisted of 2 printed colored photographs "14 x 8 cm" of the 2 selected sites, so that every page has a photograph and a questionnaire.

4-4-PROCEDURE

A photo-questionnaire was distributed among the volunteers. The questionnaire form had two pages, every page stands for one context of the

selected sites with a picture refers to the context, the first page is for the Fatimid Cairo, the second page is for El Korba district. It indicated that the volunteers would be evaluating 2 photographs.

5-RESULTS

5-1- THE RELATION BETWEEN COMPATIBILITY DUE TO VISUAL CONTINUITY AND ELEMENTS OF VISUAL DESIGN

Many statistical methods could be applied to test the relationship between compatibility due to visual continuity and elements of visual design such as; Multi-variate factor analysis with its applications: (component loading, commonality, correlation matrix), Regression, and T test. To understand how the variables of the study worked together, Multiple Regression Analyses, which take correlation among predictors into account, were performed. It is the relation between the dependent variable (compatibility due to visual continuity) and the independent variables (site organization with its minor elements, mass with its minor elements, façade features with its minor elements).

By looking on (R square) in the following tables, when it is $>$ or $= 0.5$, then depending of contextual compatibility due to visual continuity on the variables is high. In El Korba district, only two variables were more than 0.5 in their (R square), the **façade openings** which was 0.554730131 and the **façade details** which was 0.593099671. This means that compatibility through visual continuity depends on these two variables due to laymen and public. While in Fatimid Cairo, the results are different, all the design elements' values are less than 0.5; this means that visual compatibility is more in El Korba district.

Architectural Elements in El Korba district

Size in El korba

Regression Statistics	
Multiple R	0.153166744
R Square	0.023460051
Adjusted R Square	-0.011416375
Standard Error	9.53162783
Observations	30

Volume in El korba

Regression Statistics	
Multiple R	0.125153574
R Square	0.015663417
Adjusted R Square	-0.019491461
Standard Error	9.569602147
Observations	30

Materials in El korba

Regression Statistics	
Multiple R	0.300156189
R Square	0.090093738
Adjusted R Square	0.057597086
Standard Error	9.200689963
Observations	30

Fittingness in El korba

Regression Statistics	
Multiple R	0.165387741
R Square	0.027353105
Adjusted R Square	-0.007384284
Standard Error	9.512609565
Observations	30

Scale in El korba

Regression Statistics	
Multiple R	0.16247783
R Square	0.026399045
Adjusted R Square	-0.008372417
Standard Error	9.517273833
Observations	30

Style in El korba

Regression Statistics	
Multiple R	0.307092113
R Square	0.094305566
Adjusted R Square	0.061959336
Standard Error	9.179370916
Observations	30

Height in El korba

Regression Statistics	
Multiple R	0.087909164
R Square	0.007728021
Adjusted R Square	-0.027710264
Standard Error	9.608098201
Observations	30

Color in El korba

Regression Statistics	
Multiple R	0.347712909
R Square	0.120904267
Adjusted R Square	0.089507991
Standard Error	9.043575228
Observations	30

Openings in El korba

Regression Statistics	
Multiple R	0.744802075
R Square	0.554730131
Adjusted R Square	0.538827636
Standard Error	0.812375255
Observations	30

Shape in El korba

Regression Statistics	
Multiple R	0.142116934
R Square	0.020197223
Adjusted R Square	-0.014795733
Standard Error	9.547538153
Observations	30

Texture in El korba

Regression Statistics	
Multiple R	0.290104869
R Square	0.084160835
Adjusted R Square	0.051452294
Standard Error	9.230637063
Observations	30

Details in El korba

Regression Statistics	
Multiple R	0.770129646
R Square	0.593099671
Adjusted R Square	0.578567517
Standard Error	0.776585099
Observations	30

Architectural Elements in Fatimid Cairo district**Size in Fatimid Cairo**

Regression Statistics	
Multiple R	0.480909959
R Square	0.231274389
Adjusted R Square	0.203819902
Standard Error	1.041370348
Observations	30

Volume in Fatimid Cairo

Regression Statistics	
Multiple R	0.378332322
R Square	0.143135346
Adjusted R Square	0.112533037
Standard Error	1.099450412
Observations	30

Materials in Fatimid Cairo

Regression Statistics	
Multiple R	0.414593248
R Square	0.171887561
Adjusted R Square	0.142312117
Standard Error	1.080846912
Observations	30

Fittingness in Fatimid Cairo

Regression Statistics	
Multiple R	0.352359236
R Square	0.124157031
Adjusted R Square	0.092876925
Standard Error	1.11155935
Observations	30

Scale in Fatimid Cairo

Regression Statistics	
Multiple R	0.385055436
R Square	0.148267689
Adjusted R Square	0.117848678
Standard Error	1.09615279
Observations	30

Style in Fatimid Cairo

Regression Statistics	
Multiple R	0.617338085
R Square	0.381106311
Adjusted R Square	0.359002965
Standard Error	0.93438866
Observations	30

Height in Fatimid Cairo

Regression Statistics	
Multiple R	0.457243855
R Square	0.209071943
Adjusted R Square	0.180824513
Standard Error	1.056301808
Observations	30

Color in Fatimid Cairo

Regression Statistics	
Multiple R	0.224256097
R Square	0.050290797
Adjusted R Square	0.016372611
Standard Error	1.157483624
Observations	30

Openings in Fatimid Cairo

Regression Statistics	
Multiple R	0.635012814
R Square	0.403241273
Adjusted R Square	0.381928462
Standard Error	0.917527144
Observations	30

Shape in Fatimid Cairo

Regression Statistics	
Multiple R	0.425995234
R Square	0.181471939
Adjusted R Square	0.152238794
Standard Error	1.074573976
Observations	30

Texture in Fatimid Cairo

Regression Statistics	
Multiple R	0.542990472
R Square	0.294838652
Adjusted R Square	0.269654318
Standard Error	0.99738718
Observations	30

Details in Fatimid Cairo

Regression Statistics	
Multiple R	0.633178613
R Square	0.400915156
Adjusted R Square	0.379519268
Standard Error	0.919313629
Observations	30

6-DISCUSSION**6-1- COMPATIBILITY DUE TO VISUAL CONTINUITY AND DESIGN ELEMENTS**

Depending on Multiple Regression Analysis as stated previously, results are shown to be different between the 2 selected sites, in El Korba district the visual compatibility depends on the façade openings and the façade details due to laymen point of view, this may be due to the different proportions of shops under the buildings in the ground ribbon, if openings and details in the whole façade are matching with each other, then a visual compatibility in the whole street will be gained.

While in the other context - Fatimid Cairo - all the results were less than 0.5, but also the façade openings and façade details were the only two elements above 0.4, this means the effectiveness of these two architectural elements in the site.

7-CONCLUSIONS

The findings of this research highlighted two conclusions: First the effectiveness of the (façade features) specially the **façade openings** and the **façade details** in the visual compatibility. Second the other two major elements (Site Arrangement

and Mass) with their minor elements have lower values; which means they are not effective in the visual compatibility of the site.

From the previous investigation, we conclude that areas of historical values seek façade **openings** and **details**, they are important when designing or renovating a shop façade, matching the whole

ground ribbon should be an aim to gain visual compatibility. Although there is another point of view debating that designing a new different and contrasting façade with the surroundings is better in these historical areas to be iconic and unique. Yet the research is against this idea. The research approves the visual components, façade openings and details to reach visual compatibility.

REFERENCES

- 1- Abu-Obeid, N., Malkawi, F. K., Nassar, K., Al-eideh, B., "Cognitive-Mathematical Approaches for Evaluating Architectural Contextual Fit", pp. 164-167, 2009.
- 2- Auburn, T. and Barnes, R., "Producing place: A Neo-Schutzian Perspective on the Psychology of Place", *Journal of Environmental Psychology*, Volume 26, www.elsevier.com, pp.38-43, 2006.
- 3- Brolin, B. C., "Architecture in Context: Fitting New Buildings with Old", Van Nostrand Reinhold, New York, p.35, 2002.
- 4- Groat, L., "Contextual Compatibility in Architecture", 1988, in D., Canter, M., Krumpal, D., Ska (eds), "Environmental Perspectives", Aldershot, Avebery, pp.224-233, 1988.
- 5- Groat, L., "Contextual Compatibility in Architecture: an issue of personal taste?" in D., Canter, M., Krumpal, D., Ska (eds), "Environmental Perspectives", Aldershot, Avebery, pp.230-233, 1988.
- 6- Lynch, K., "The Image of the City", Harvard College, United States of America, pp.50-80, 1960.
- 7- Alexander, C., Ishikawa, S., & Silverstein, M., "A Pattern Language: Towns, Buildings, Construction", New York, NY: Oxford University, p.10, 1977.
- 8- Jencks, C., and Kropf, K., "Theories and Manifestoes of Contemporary Architecture", Academy Editions, Great Britain, pp. 8-19, 1999.
- 9- Cullen, G., "Townscape", Springer, pp.100-110, 1991.
- 10- Cullen, G., "The Concise Townscape", Routledge, p.77, 2012.