

ASSESSING PERCEPTIONS OF DI FAUSTO'S NEO-TRADITIONAL ARCHITECTURE BASED ON PERSONAL CONSTRUCT METHODOLOGY

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Currently there is a major debate in architectural circles between two groups of scholars and professionals. One group completely rejects learning from and drawing on past architectures in creating new works while the other one builds a new architecture based on the past. Using personal construct methodology, this study examines the work of Di Fausto, as expressed in three Libyan designs of the 1930s. Results showed that a different architectural 'brand image' and an 'ideal image' exist in each culturally different region. Architectural design both as it taught and in practice must change towards incorporating the 'inherent image' of the local inhabitants in the creative thinking process of new buildings if those buildings are to be meaningful for them.

Keywords: Architectural schools of thought, brand image, ideal image, inherent image, personal construct methodology.

INTRODUCTION

Architects practice using a number of contemporary architectural languages but they face difficulties in achieving meaning in a building that balances belonging to a place, a people and a contemporary time as perceived by both other architects and laypeople. Of particular interest is whether architects and laypeople can agree on what is 'local' but 'modern' architecture and what is not in assessing new buildings. This study addresses this issue; it focuses on the nature of meaning as communicated by buildings.

The buildings we see in our cities are the final products of architects and professionals practicing architectural design by applying various generic 'schools of thought' to design diverse building types. These schools are established on an intellectual basis that fails to address the cultural features of local architecture held by the local inhabitants. These practices, nevertheless, form a significant basis for teaching design in architectural schools. Several scholars have studied the interpretation of buildings' appearance by both laypeople and architects (Gifford et al., 2002; Groat, 1982; Hershberger & Cass, 1974; Nasar, 1989; Purcell, 1986). The results showed

that there was no agreement between these two groups on the architectural meaning of buildings.

These schools of thought continue to generate this lack of consensus in architectural meanings. For example, the model of creative thinking of the school of Bauhaus which calls for working on the points, lines, surfaces with a 'free imagination' to create an abstract expression of architecture (Lang, 2009). Currently, Sustainable and Green architecture are based on the scientific mechanical evidence, and the voice of architects as primarily form and space makers are relegated to the back stage. While focusing narrowly on designing with climate in mind, as Charles Correa (1983) suggested, cultural factors get lost.

Architects create a highly individualized brand image for their ideologies of architecture. Exploiting this brand image distinguishes their own work from those of others competing for commissions in the marketplace. For instance, in practice global architects Frank Gehry and Zaha Hadid create distinct individual buildings that are universally recognized as their personal brands. These architectural works may be important to the cognoscenti but the end-users who

view and use the buildings may find little meaning in the new formal characteristics. Thus, when it comes to the identity of the image of architecture, it creates an emotional disconnection between the end-users and what they see around them.

This research attempts to contribute to the field of meaning in architecture by answering two questions:

- What is the direction that architecture should take for the future? (Groat, 1981; Lang, 2009)
- How can the issue of meaning in architecture be resolved? (Groat, 1981; Lang, 2009; Nasar, 1989; 1994).

Although often discussed as an approach that panders to nostalgia, there is a need to better understand Neo-traditional developments in architecture (Nasar, 2003). In many countries, including Libya, Neo-traditional architecture appears to be important in creating a built environment that belongs to people, a place and our present time, in a way that the other approaches fail to do (Daza, 1982; Lang, 2009). Therefore, this study explores the potential of Neo-traditional architecture as a mechanism for architects' creative thinking to achieve a sense of attachment in the end-users' minds to an existing local brand of architecture.

THEORETICAL FRAMEWORK

In practice, the architects' creative thinking shifts from striving to meet the end-users' meaningful design features that are embodied in a local brand of architecture, to satisfying the requirements, and applications of the adopted new intellectual movements of global trends of architecture. These movements result from an individual or a group of individuals exploring new systems of creativity to construe the world at the expense of the unself-conscious human evolution of societies and culture. Consequently, it is difficult for any intellectual movement in architecture to continue for a long period of time if it does not consider the individuals and the society in any future changes. Triandis and Suh argued that:

"[Culture] includes what has worked in the experience of a society, so that it was worth transmitting to future generations."
(Triandis and Suh 2002, p.135)

Global architecture and the brands associated with global architects create built environments that rarely meet the identity of a specific place. These approaches constitute an international brand of architecture. The problem arises when local people hold images of architecture that are unlike the international images. The assault on past architecture in order to create a new beginning without any reference to traditional images may satisfy one group of people, those wishing to be part of the global world, while destroying the feelings of another group of people in the local world who are actually the end-users of the products developed.

A measurable and self-sustainable local brand of architecture

The creative use of traditional or vernacular architecture in new buildings is the basis for designing modern environments that respect the identity of a people and a place. Neo-traditional architecture as a brand is considered as a measurable approach in architecture. 'Measurable' means that it can be understood and evaluated equally by both laypeople and architects. Branding, as a mechanism of thinking in the design process, requires considering laypeople in the assessment of a new building. Designing new buildings towards archiving a positive inherent image enables its inhabitants to monitor the evolution of the architectural character of their locale.

The idea of designing for an architectural brand as a mechanism to enhance architects' creative thinking, is primarily based on the psychological understanding of perception and cognition of architectural brands. Brand, as a concept, refers to the recollections of images embedded in people's mind of the products or buildings representing the culture of their locale. This recollection of images constitutes an understandable environment establishing the basis for creativity by continuing the emotional connection between people and a building's appear-

ance. As a result of this mechanism a self-sustainable architectural image of a locale is developed and continue to evolve over a long time.

Modelling the theoretical framework

The major focus of the self-sustainable architectural image model is to shift architects' creative thinking from 'free imagination' to an 'under-pinned imagination' based on the brand image of a locale. In Neo-traditional architecture, the architects' creative thinking focuses on balancing

three features of concern in designing a new building. These features are the building being local, aesthetically pleasing and modern/up-to-date in the sights of both laypeople and architects. The model in Figure 1 constitutes both what we consider as a self-sustainable architectural image of built environment and what is not. The model includes a number of named images to represent some trends in the practice of architecture or what is proposed in the theoretical framework. These images are used in the empirical study as factors for examination (Appendix-A).

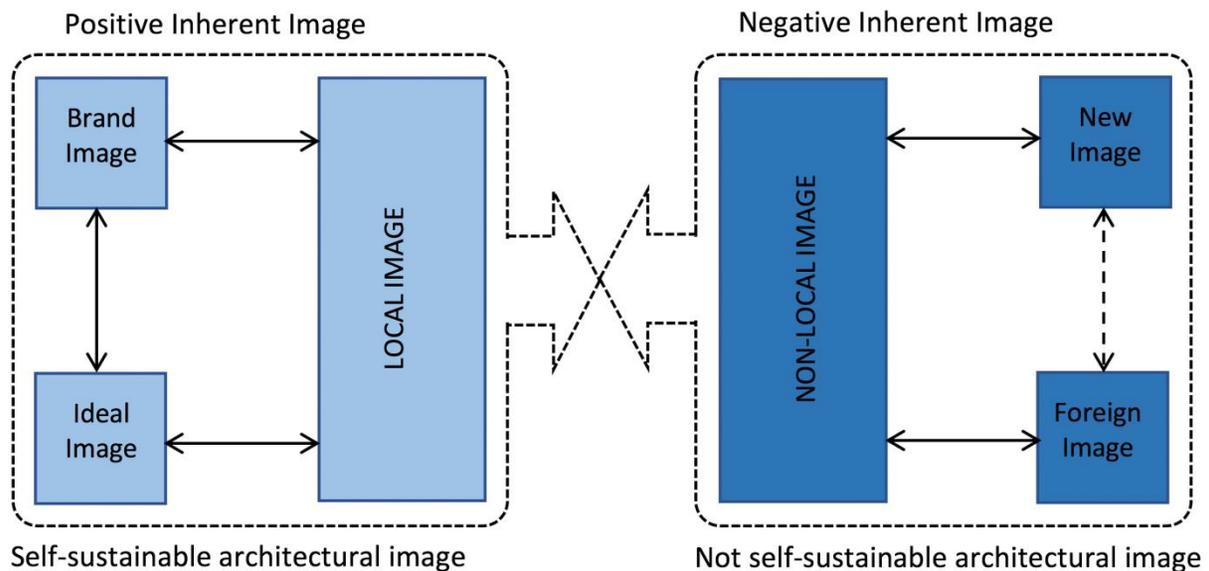


Figure 1: *The self-sustainable architectural image*

The inherent image represents the current architectural image in the inhabitants' perception to their locale. The psychological process of this image is based on perceptions and cognitions related to the visual experiences of the inhabitants of a locale. These visual experiences are embedded as an intrinsic part of human psyche. A positive inherent image is the result of the self-sustainable evolution of architectural image of a locale.

The brand image consists of the architectural shapes and forms that have evolved into a unique symbol of a people's cultural background. This image is attached to the inhabi-

tants' past experiences, uninfluenced by the intellectual directions of architecture and thus, emotionally meaningful to them. Additionally, the ideal image serves as a benchmark for evaluating the future desired architectural meanings and forms that are embedded in a building's appearance.

The new image represents architectural meanings and forms that are nonexistent in a locale. This image is designed by global architects based on theories/ideologies of architecture such as critical regionalism. The foreign image may well reflect the non-local existing architec-

tural forms or building appearances that might meet the identity requirements of another place.

As observed in Figure 1, the brand image serves as a basis to create new local architectural image and an attachment to the past. In contradiction, inherent images formed due to new and foreign images express the byproducts of global architectural trends that are nonexistent in the locale. As a result of this destructive creative system, a negative inherent image is developed.

Decisions made by architects during the design process, if they are required to consider the end-users' expectations of their built environment, must be made based on assessment of people's response to architectural forms. Thus, design quality of a building is considered positive, only if the building's appearance matches the people's brand and ideal images.

Assessing perceptions of building appearance

Assessing the visual quality of a building is a complex matter particularly when it involves both laypeople and architects. In this study, *positive visual quality* is the way that the inhabitants see the built environment as being part of the local brand. The architectural characteristics of a brand are unique for a particular locale and referred to as a brand image. George Santayana (1896) found that it was reasonable to construe the interaction between people and the visual quality of the built environment through following three categories of qualities: sensory/emotional, symbolic, and formal. These qualities underpin people's verbal responses to a building's appearance while interpreting what they see in a building. The following observations identify the variables studied by scholars in architecture to understand or measure emotional, symbolic and formal qualities.

Emotional quality constitutes people's attachment to different styles of architecture represented by *interest, pleasure and desirability* (Nasar, 1994). By these variables an overall response of the love/hate relationship between people and their built environments is provided. *Symbolic quality* provides an understanding of the visual quality achieved through meanings attached to the symbolic forms of the building (Lang and Moleski, 2010). Lang (1988), identi-

fied four variables that carry symbolic meanings: *material, color, architectural character and illumination and shadow*. *Formal quality* is depicted through the selection, improvement and use of architectural vocabularies from vernacular architecture. The variables suggested by Lang (1983; 1984) to study formal quality are: *shape, proportion and scale, complexity, order and rhythm*.

CASE STUDY

The selection of a case study is pivotal for any empirical study. Generally, buildings, neighborhoods and cities serve as case studies for the examination of hypotheses or to answer questions in architecture (Groat & Wang, 2002; 2013). In this study, Florestano Di Fausto (1890-1965) is recognized as a brand designer strategist (Aguel, 2017). He was an Italian architect, displaying distinguishable style separate to the modern architecture being built in Libya between 1920 and 1940s. Di Fausto designed his buildings within the Libyan cities to be unique and respectful to the inhabitant's inherent image. Consequently, he portrayed a style of architecture which was neither traditional nor modern (Anderson, 2010; Lang, 2014). Therefore, three of Di Fausto's designs have been selected as potential case studies. These designs were drawn from three cities in Libya: Tripoli, Ghadames and Yefren, each with a unique architectural heritage and different culture / geographic / climatic environment (coastal, mountain and desert). Each of these cities have a building designed by Di Fausto based on the local vernacular architecture/brand image. These buildings were used as stimuli in the empirical study to examine the research hypothesis.

RESEARCH HYPOTHESIS

H1: The Neo-traditional style in architecture, as expressed in Di Fausto's Libyan designs, is regarded positively as local by the local laypeople and local architects because it responds to their 'inherent image' of identity of place and time.

Hypothesis H1 has been sub-structured into three testable hypotheses H1-1, H1-2 and H1-3 described as follows:

- *H1-1: Architects and laypeople from Tripoli found that BIT (Brand Image of Tripoli), DT (Di Fausto Tripoli) and IB (Ideal Building) were related to each other and far from FI (Foreign Image) and NI (New Image).*
- *H1-2: Architects and laypeople from Ghadames found that BIG (Brand Image of Ghadames), DG (Di Fausto Ghadames) and IB (Ideal Building) were related to each other and far from FI (Foreign Image) and NI (New Image).*
- *H1-3: Architects and laypeople from Yefren found that BIY (Brand Image of Yefren), DY (Di Fausto Yefren) and IB (Ideal Building) were related to each other and far from FI (Foreign Image) and NI (New Image).*

PERSONAL CONSTRUCT METHODOLOGY

Personal Construct Theory (PCT) is a theory of personality and cognition proposed by George Kelly in the 1950s. Kelly used this theory to help people make sense of their environment. It enabled them to construe their meanings verbally as words or short sentences. This method is effective in investigating controversial and sensitive topics (Caputi et al, 2011). It is a method primarily used in psychology, however, it has been applied in many disciplines as well. While this method has had limited use in the study of the built environment (Hershberger & Cass, 1974; Harrison & Sarre, 1975), this study re-examines the effectiveness of PCT for assessing perceptions of building's appearance through the use of sci:vesco as an innovative Repertory Grid Technique (RGT). Sci:vesco is a real-time online interactive repertory grid for conducting standardized interviews developed by the German company "Elements and Constructs GmbH & Co. KG" using special psychologists and computer programmers (Elements and constructs, 2011). This software enables the efficient organization of online interviews to analyse, summarize and compare personality traits, opinions and insights based on principal compo-

nent analysis (PCA) (Rosenberger & Freitag, 2009). Thus, sci:vesco serves as an evaluative instrument that provides an intuitive, understandable three dimensional graphic representation of individual and group data analyses results in a hexahedron space with high content reliability. This method was executed through:

1. RGT - closed-ended constructs, where constructs were presented to the interviewee as bipolar scales pre-prepared by the researcher. Further, the interviewees were asked to arrange the elements of buildings on the given bipolar scales only,
2. RGT - open-ended constructs where the interviewees were guided to construe their own meanings in bipolar scales. Further, they were asked to arrange the elements of buildings on their created bipolar scales.

Within the context of PCT, technical innovations enable the interviewer to set up the software prior to the interview. Being individually adaptive, the interviewees deal with the visual elements in the task by looking at similarities and differences in the photographs, while ordering them according to the relevant polar. Specific values or numbers are not used to weight the elements. This process emulates as close as possible to people's natural behaviour in their everyday interactions with the environment. Also, the tool enables collective intelligence where both individual and group opinions can be presented in simple visual orientations (Rosenberger & Freitag, 2009). Consequently, the software optimises previous RGT by serving as an innovative online system while remaining true to the theory.

EMPIRICAL STUDY

The ethical approval for this study (number 135029) and components required to conduct the study were obtained from the University of New South Wales Code of Conduct before starting the study. The empirical study was used to elicit the architects' and laypeople's responses to Di Fausto's neo-traditional architecture versus global architecture. Experimental studies introduce changes in independent variables to see

their effects on the dependent variables under controlled conditions (Nasar, 2008). The stimuli are independent variables (elements) and the participants' responses are dependent variables (constructs). As inferred from the theoretical framework, traditional architecture and neo-traditional architecture represents the brand im-

age and local image respectively, while global architecture is represented in two images (existing and non-existing): the existing foreign image or non-local and the new image that designed in response to current global trends in architecture (Aguel, 2016).

Table 1: *Dependent and Independent variables*

Constructs			Elements	
Dependent Variables			Independent Variables	
What people say			What people see	
Response/Verbal			Images/Photographs	
Emotional quality	Symbolic quality	Formal quality		Factors
		A	B	
Interest Pleasant Desirable	Material Culture Colour Illumination and Shadow	Shape Proportion and Scale Complexity and Order	Rhythm Incongruity, Surprise and Novelty	Brand Image Local Image Foreign Image New Image Ideal Image

After the establishment of the case study, the research is composed of the selection of photographs (elements-stimuli), study sample (participants), establishment of constructs and development of a protocol for conducting the interviews.

Elements

Elements constitute things, people, products, brand images and events relevant to the topic or issue investigated (Jankowice, 2004). Studies of urban environment use photographs as elements to represent specific sides of the conducted study.

Fifteen photographs of similar dimensions were selected as stimuli (width-6cm; height-4.5-6cm). These were used to complete individual interviews of 30-60 minutes duration, avoiding fatigue by controlled number of photographs and number of constructs. The selection of photographs exhibited a unique scope in the assessment of perceptions. Firstly, buildings of similar size were selected with certain buildings of different size in order to test people's response to high buildings. Secondly, composition of each

stimuli was important for the completion of certain tasks in the interview (such as the color, the effect of light, shadow and rhythm), for measuring people's response to the design quality of building appearance. Thirdly, both black/white and colour photographs were used. Finally, the proportions in dimensions of the photographs were varied based on the architectural composition (Appendix A).

Constructs

The fundamental unit in describing or analyzing an object in the surrounding, based on PCT is called a construct. To construe is to find meaning in the object in order to have a personal understanding of it (Jankowicz, 2004). In this research, constructs include sentences representing a specific meaning of visual appearance. These constitute bipolar scales used to evaluate the visual qualities of the elements/buildings. These scales were developed to be easily understood by both laypeople and architects; measurable and easy to rate or arrange the elements; and reinforce the operational definition of the research variables.

Table 2: *The elements and symbols used in this study*

Elements in the study	Colour	Symbols	Factors of:	Symbols
'Vernacular Tripoli 1'	Sky blue ●	'VT1'	Brand Image of Tripoli	BIT
'Vernacular Tripoli 2'	Sky blue ●	'VT2'		
'Vernacular Ghadames 1'	Yellow ●	'VG1'	Brand Image of Ghadames	BIG
'Vernacular Ghadames 2'	Yellow ●	'VG2'		
'Vernacular Yefren 1'	Green ●	'VF1'	Brand Image of Yefren	BIY
'Vernacular Yefren 2'	Green ●	'VF2'		
'Di Fausto Tripoli'	Sky blue ●	'DT'	Local Image of Di Fausto in each city	DT
'Di Fausto Ghadames'	Yellow ●	'DG'		DG
'Di Fausto Yefren'	Green ●	'DY'		DY
'Foreign Tripoli'	Sky blue ●	'FT'	Foreign Image: Non-local existing building in the same places as Di Fausto's buildings	FI
'Foreign Ghadames'	Yellow ●	'FG'		
'Foreign Yefren'	Green ●	'FY'		
'Foster'	Blue ●	'F'	New Image: Buildings representing new form	NI
'Hadid'	Blue ●	'H'		
'Gehry'	Blue ●	'G'		
'Thumb up'	Red ●	'IB'	Peoples' ideal image of buildings	IB

The closed-ended constructs were supplied to the interviewee as bipolar constructs, developed based on the variables for each type of quality (Table 1). They were represented in codes (Table 3). On the other hand, open-ended constructs were elicited directly from the partici-

pants without any codes. All constructs were based on the operational definition of each variable. A few constructs (4 among 24) developed for single aspects of each of the variables have been discussed in Table 4 as an example.

Table 3: *Constructs and codes used*

Type of quality	The Code of the supplied constructs		
	Construct code starts	Construct code ends	Total no: of constructs
Emotional Quality	<i>EQ.01 a (vs) EQ.01b</i>	<i>EQ.12 a (vs) EQ.12b</i>	24
Symbolic Quality	<i>SQ.13 a (vs) SQ.13b</i>	<i>SQ.24 a (vs) SQ.24b</i>	24
Formal Quality A	<i>FQ.25 a (vs) FQ.25b</i>	<i>FQ.36 a (vs) FQ.36b</i>	24
Formal Quality B	<i>FQ.37 a (vs) FQ.37b</i>	<i>FQ.48 a (vs) FQ.48b</i>	24

Table 4: *Example of 4 Constructs of Emotional Quality (Interest)*

	Code	Construct
Interest	<i>EQ.01a</i>	<i>The building holds the attention</i>
	<i>EQ.01b</i>	<i>The building does not hold the attention</i>
	<i>EQ.02a</i>	<i>The building is thought provoking</i>
	<i>EQ.02b</i>	<i>The building is not thought provoking</i>

For the study, the bipolar scale was adjusted to seven grades between the two opposite poles. Each pole represented a particular construct that was formed to elicit specific meanings attached to the building. Seven spaces between the poles served as possible grades for arranging the elements in the interview.

Participants

The participants were originally from or had lived in one of the three cities of Tripoli, Ghadames and Yefren, where Di Fausto designed the three buildings in the 1930s. Although, a sample of 216 were potential respondents, the interview was conducted using 95 participants only. This unanticipated reduction in the participants was due to the limitations of indirect distant interview, with interruptions in the availability of internet facility in the cities of Ghadames and Yefren (interviewer in Australia; interviewees distributed in Tripoli, Ghadames and Yefren). Consequently, the participants selected from the three cities included 81 respondents from Tripoli, 6 from Ghadames and 8 from Yefren. Non-probability sampling methods of accidental sampling and snowball sampling were used. Accidental sample gathering process used questionnaire as a tool to reach out to the widest number of targeted population through online technologies. Targeted population was established into groups through online tools (supported by Survey monkey and promoted through Facebook) in order to discuss matters related to architecture or old photographs of Libya. This was developed as a means to determine the eligibility of each potential participant. The evaluative questions used in the questionnaire provided an initial indication of people's perception of the inherent image of their locale. Additionally, snowball sampling was used as a means of gaining access to the recommended subjects in the questionnaire. This provided access to other nominated people, such as professionals in architecture during the interviews with selected participants. Thus, the participant selection attempted to gather a sufficient number of participants with diverse viewpoints chosen at random from the results of the questionnaire.

Procedure

Participants from the three cities were interviewed using sci:vesco online interview method. In this method, the interviewer is in front of a monitor with readily configured sci:vesco live online interview setup, and is connected online with the interviewee at his/her home. People's perceptions were tested using both closed ended constructs and open-ended constructs. In the former, constructs were supplied to the interviewee based on the three qualities. While in the latter, constructs were elicited by facilitating the interviewee to construct their personal meaning of the task.

RESULTS AND DISCUSSIONS

Results of the empirical study are categorized and discussed as follows: Assessment of perceptions of participants through the analysis of emotional, symbolic and formal qualities using RGT; Examination of hypothesis; and describing the 'brand', 'ideal' and 'inherent' images, which are vital to represent the participants' responses to a building's appearance.

Repertory Grid Analysis

Repertory Grid Technique was used to assist respondents articulate their views free from the interviewer bias. Ninety-five grids, each completed by the participants were analyzed both individually and together with other grids to obtain the overall response to building appearance (Figure 2). The RGT was executed through two methods: RGT-closed-ended constructs and RGT-open-ended constructs as discussed below.

The Principal Components of Repertory Grids

The principal components of repertory grids include three-dimensional co-ordinates that represent multidimensional scaling. The two horizontal axes refers to the constructs. One axis is read from the right (positive) to the left (negative), while the other is read from near (highly substantial) to far (less substantial). The third

vertical axis relates to the changing value attached to the elements. The value lowers as movement progresses from top (greatest value) to bottom (lowest value). Depending on the measured quality in the grid, the upper and lower right quadrants represent elements associated with the positive constructs. Similarly, the upper and lower left quadrants represent the elements related to the negative constructs. However, elements in both the upper quadrants are of higher value and lower quadrants are of lower value. The colored balls represent the elements signifying the selected buildings in each of the cities (Table 2). The codes represented by numbers and letters denote the close ended constructs (Table 3). Positioning of the elements closer to the center, reflects uncertainty in the participant responses. In contrast, elements closer to the outer edges represent clarity and certainty in response to these elements. Similarity in responses is recognized by the grouping of the elements. Although qualitatively interpreted, a clear statistical understanding of people's response is established by the Euclidean distances between the elements.

Overall response of Repertory Grids

As observed from (Figure 2) the elements bunched together share similar meanings in the participants' responses. This similarity is clear in the case of buildings by 'Gehry' 'G', 'Foster' 'F' and 'Hadid' 'H', representing the factor of new images (NI). Also, 'Di Fausto Tripoli' (DT), 'Vernacular images of Tripoli 1 and 2' 'VT1' and 'VT2', representing the Brand Image of Tripoli (BIT) are clustered together. The elements of 'Vernacular Ghadames' 'VG1' and 'VG2', representing Brand Image of Ghadames (BIG) are grouped together with 'Di Fausto Ghadames' 'DG'. Furthermore, 'Foreign Tripoli' 'FT' and 'Foreign Yefren' 'FY' are excluded from the other elements although they are bunched together. This result suggests that the participants have similar responses and these elements are not architecturally acceptable in any of the three cities. 'Foreign Ghadames' 'FG'

is not perceived as part of architecture in any of the three cities, even though it has a higher value in the participants' responses. Additionally, 'Di Fausto Yefren' 'DY' appears between two groups of elements corresponding to Tripoli and Ghadames, which shows that these building share visual characteristics found in the brand image of the three cities.

The right side and left side of the co-ordinates indicate the positive and negative elements respectively. The placement of three foreign elements (FI) close to the center of the co-ordinates, indicated the uncertain response of the participants. However, 'Foreign Ghadames' 'FG' is higher in value in the participants' response when compared to 'Foreign Tripoli' 'FT' and 'Foreign Yefren' 'FY'.

Brand Image of Tripoli (BIT) and 'Di Fausto Tripoli' 'DG' bunched together in the upper right quadrant, represents the elements higher in value of quality and positive constructs. Therefore, they represent the Ideal Building 'IB'. While the elements of the New Image (NI) appear in the lower left quadrant representing elements in value of low quality and associated with negative constructs. Therefore, the New Image (NI) are far from representing the ideal building.

Open-ended constructs

The participants were guided to construe their own meanings in bipolar scales and later asked to arrange the elements of buildings on their created scales, the results of which are discussed below.

IB is bunched with 'Di Fausto Tripoli' 'DT' and 'Vernacular Tripoli' 'VT1' in the positive quadrant. Also, the elements representing NI is clustered together with FI in the negative side of the co-ordinates. The closeness of 'DT' and 'IB' suggest that the upper surfaces are an essential part of the architectural composition. Additionally, the ideal building is preferred to be made of compact blocks notable in the old city of Tripoli, appropriate to the locale.

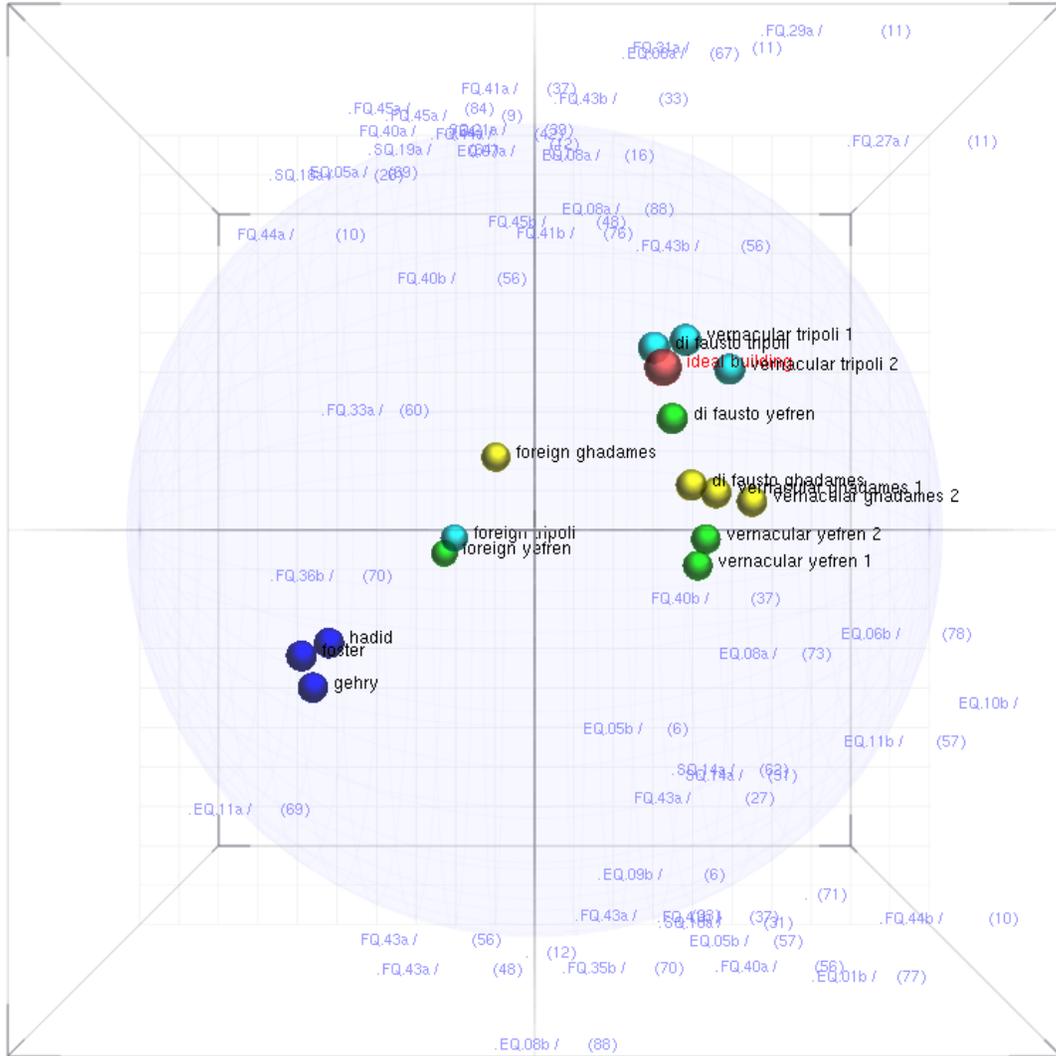


Figure 2: The principal components of repertory grid – overall response to building appearance

In contrast, response to the NI is identified to depict unusual shapes, non-local architectural vocabularies and unsuitable building materials for the city of Tripoli. Although, the buildings are made of compact blocks, their complexity of shape using new building technology rate them as ‘selfish’ and ‘solitary’. These building qualities observed in the global architecture are considered inappropriate and far from the ideal building image. As observed in Figure 3, compatibility between this result and the overall results validate the assessment in the closed-ended construct task. Thus, results using participants’ personal constructs support the findings obtained using closed-ended constructs.

Further, the hierarchy of qualities (most important to the less important) in the participants’ responses is highlighted by categorizing the similar constructs within the 256 constructs elicited from the participants in the open-ended constructs. Using the same variables from each of the three qualities, evaluations were made on the rating value of the IB, by summarizing the rating of the IB and the number of constructs in each variable. The unusual constructs that were not similar to the supplied construct responses, are also categorized to examine any new areas of interest that have not been considered. The results suggest that almost 60% of the responses

depict Symbolic Quality and 30% Formal Quality A (Table 5). On the other hand, Formal Quality B achieves less than 7% while emotional quality achieves less than 4%. The unusual responses or

new constructs form 2% of the 256 constructs raised in the participants' responses. These findings highlight the importance of the three qualities forming the basis of the empirical study.

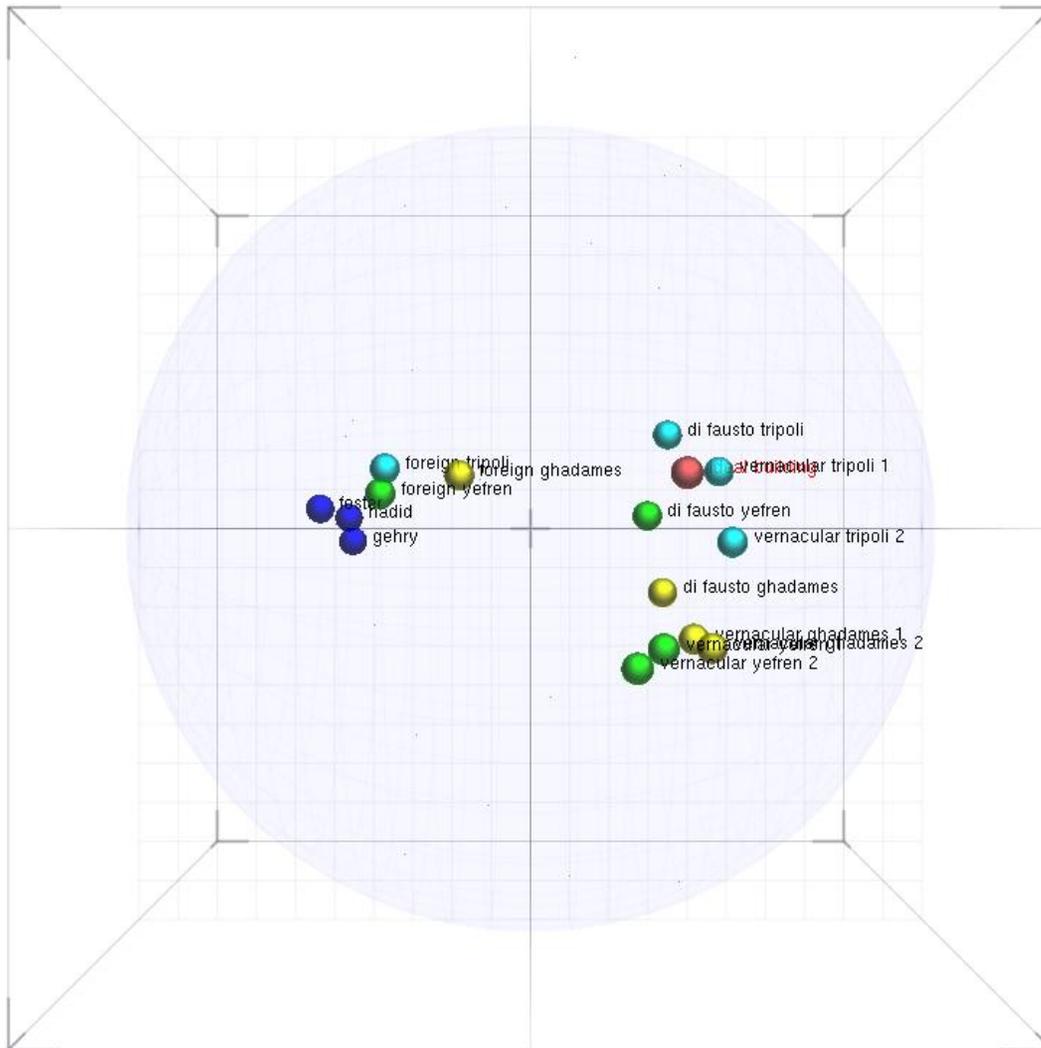


Figure 3: *The principal components of repertory grid – open ended constructs*

The most important variables in the responses are: Architectural character and Materials (Symbolic Quality); Shape and Scale (Formal Quality A). It also reveals that architects should carefully deal with these four variables in the design process.

Hypotheses examination

The primary hypotheses (H1) is not rejected and has been examined using Euclidean distances between the factors and the ideal building as obtained from sci:vesco.

Table 5: *The weight of each quality in the participants' response based on the rating of the ideal building in the open-ended constructs.*

Type of quality	Rating value of the ideal building		Constructs raised by the participants	
	Sum of rating values	Percentage	Sum of number of constructs	Percentage
Symbolic Quality	7800	58.78 %	151	58.30 %
Formal Quality A	3855	29.05 %	77	29.73 %
Formal Quality B	855	6.44 %	16	6.18 %
Emotional Quality	480	3.62 %	10	3.86 %
New Constructs	280	2.11 %	5	1.93 %
Sum	13270	100 %	256	100 %

Euclidean distances

The distances between the Ideal Building IB and other factors are assessed based on the fact that, small distance between the factors refer to substantial relationship, while larger distance refer to less substantial relationships.

H1-1 is not rejected by the results. Both Tripoli architects (BIT- 08.55, DT- 01.29 and IB- 00.00) and laypeople (BIT-14.76, DT- 05.77 and IB- 00.00) found the factors BIT, DT and IB close to each other. Similarly, Tripoli architects (NI- 49.82 and FI-38.19) and laypeople (NI-49.82 and FI-38.19) view the factors far from IB (

Table 6).

H1-2 is not rejected by the results. An agreement exists between the Ghadames architects (BIG- 03.66, DG- 04.25 and IB- 00.00) and laypeople (BIG- 05.13, DG- 04.25 and IB- 00.00) on the close relation of BIG, DG and IB. Likewise, both the architects of Ghadames (NI-81.55 and FI-65.03) and lay people (NI-76.27 and FI-65.03) suggest that the factors NI and FI are far from IB (

Table 6).

H1-3 is not rejected by the results. The Yefren architects (BIY-09.68, DY-02.50, IB-00.00) and the Yefren laypeople (BIY-09.68, DY-02.50, IB-00.00) agree on the close relationship between the factors BIY, DY and IB. Additionally, the factors of NI and FI are regarded far from IB by both Yefren architects (NI-62.50 and FI-54.73) and laypeople (NI-52.08, FI-52.79) (

Table 6).

The results depict that the participants are emotionally connected to the vernacular architecture, as the brand image of their cities. Furthermore, Di Fausto's buildings 'DT', 'DG' and 'DY' have been considered as local buildings, by both local architects and laypeople in the three cities due to the pleasing aesthetics and up-to-date nature.

A one-way analysis of variance ANOVA (p-value should be read as significant if $p \leq .05$) to examine the differences between factors DT, BIT, DG, BIG, DY, BIY, FI and NI and the

participants' response to the ideal building IB in the three cities of Tripoli, Ghadames and Yefren.

A one-way analysis of variance ANOVA

The ANOVA shows that the brand image of each of the cities (BIT, BIG and BIY) has significant effect on the emotional connection of the respondents to their locale. Whereas, the effects of FI and NI on the inherent image of the participants is not significant (Table 7).

Table 6: Euclidean distances between the factors and the ideal building as generated using Sci:vesco

Factors	Tripoli		Ghadames		Yefren	
	Architects	Laypeople	Architects	Laypeople	Architects	Laypeople
IB	0.00	0.00	0.00	0.00	0.00	0.00
DT	01.29	05.77	29.13	45.13	11.00	12.18
BIT	08.55	14.76	19.69	37.59	11.26	15.50
DG	17.98	16.80	04.25	09.09	28.80	08.66
BIG	41.63	25.95	03.66	05.13	10.95	11.82
DY	09.63	19.63	22.40	44.85	02.50	14.64
BIY	28.63	37.16	11.09	44.41	09.68	12.33
FI	38.19	39.06	65.03	61.18	54.73	52.79
NI	49.82	51.58	81.55	76.27	62.50	52.08

There is significant effect of DT ($F=16.69$, $p=0.000$) on the people’s emotional connection to their locale. Also, DT is significant with the Brand Image of Tripoli (BIT) ($F=4.36$, $p=0.016$). Similarly, there is a significant effect of DG on the participants response in relating to their inherent image at $p=0.001$ level. Additionally, BIG ($F=12.42$, $p=0.000$) is significant with DG. DY ($F=1.20$, $p=0.306$) has no significant connection to the inherent image of the respondents, due to the requirement of brand image being specific /unique to the locale. There is no significant effect of FI ($F=2.13$, $p=0.124$) as identified by the emotional disconnection with

the existing foreign building in all the three cities. Similarly, NI ($F=2.73$, $p=0.07$) also have no significant effect on the participants’ responses from any of the three cities. These evidences support hypotheses H1. Power analysis is performed in order to detect the effect when there is an effect to be detected for obtaining practical significant results (Table 8). The effect sizes using partial eta squared validates/evaluates the practical strength / significance of the study, where ($\eta_p^2 > 0.1$) depicts small effect, ($\eta_p^2 > 0.3$) detects medium effect and ($\eta_p^2 > 0.5$) detects large effect, for conventional level of $p<0.05$.

Table 7: One-way analysis of variance ANOVA

Factors	Tripoli		Ghadames		Yefren		F-value Df=(2,93)	P-value
	Mean	SD	Mean	SD	Mean	SD		
DT	12.97	10.58	38.61	17.26	22.21	10.96	16.69	0.000*
BIT	18.98	11.82	29.40	14.27	29.58	16.14	04.36	0.016*
DG	30.29	14.76	07.58	08.76	30.03	10.65	07.16	0.001*
BIG	33.32	13.83	07.26	04.79	23.44	07.60	12.42	0.000*
DY	24.42	15.20	32.85	17.11	20.34	14.24	01.20	0.306
BIY	42.52	14.67	27.70	22.65	22.13	04.65	09.20	0.000*
FI	56.55	15.30	68.11	05.87	62.43	13.62	02.13	0.124
NI	68.91	17.08	84.66	12.79	66.63	08.89	02.73	0.070

* statistically significant

Table 8: *Interpreting ANOVA using power analysis*

Element	Partial Eta Squared	Observed Power
DT	0.264	1.0
BIT	0.133	0.925
DG	0.025	0.256
BIG	0.086	0.741
DY	0.211	0.995
BIY	0.165	0.973
FI	0.044	0.427
NI	0.056	0.528

In summary, these results suggest that the brand image (BIT, BIG and BIY) is influenced by people's emotional connection with their locale. The results specifically suggest that a brand image exists in each locale. According to the response received from the inhabitants, it can be interpreted that the brand design (DT, DG and DY) by Di Fausto in each city serves as an ideal image for each locale. Furthermore, in all the three cities, New Images do not contribute significantly to people's responses ($p = 0.070$). Furthermore, the inhabitants of the three cities are emotionally disconnected from the existing foreign buildings in their locales ($p = 0.124$).

Test of homogeneity of variances – Levene's Test

The test of homogeneity of variances states that equality of variance for all groups is an essential assumption for performing ANOVA. Due to unequal sample sizes of the three groups (Tripoli, Ghadames and Yefren), it is essential to undertake the test of homogeneity of variances.

Table 10: *Robust tests of equality of means – Welch and Forsythe tests*

Factors		Df1	Df2	F-value	P-value
BIG	Welch	2	13.637	52.611	0.000
	Brown-Forsythe	2	20.853	41.809	0.000
BIY	Welch	2	11.353	37.007	0.000
	Brown-Forsythe	2	6.111	7.481	0.023

Thus, the data is assessed for equality of variances using Levene's Test. As a rule of thumb, if the Sig. (p) < 0.05, then the variances are not equal. Hence, results of the test indicate that the variances for BIG ($F(2,93)=4.988, p=0.009$) and BIY ($F(2,93)=3.893, p=0.024$) are not equal (Table 9). Consequently, the two variables of BIG and BIY violate the homogeneity of variance assumption needed for ANOVA.

Table 9: *Test of homogeneity of variance – Levene's test*

Factors	F-value, Df=(2,93)	P-value
DT	1.291	0.280
BIT	0.777	0.463
DG	2.410	0.095
BIG	4.988	0.009*
DY	0.272	0.763
BIY	3.893	0.024*
FI	2.543	0.084
NI	2.295	0.106

* statistically significant

Robust tests of equality of means – Welch and Forsythe tests

Since, the assumption of homogeneity of variances is violated, parametric robust tests of Brown Forsythe and Welch are used to find out statistical significant difference among the means of BIG and BIY (Tomerken & Serlin, 1986). The low p values for BIG ($p=0.000$) and BIY ($p=0.000$) indicate that these results are statistically significant (Table 10). Since, the means of all the groups are not equal in the sample population, the Welch's p-value may replace the regular ANOVA p-value.

In order to derive robust estimates of standard errors and confidence intervals for analysis, bootstrapping is undertaken with a sample size of 1000 bootstraps and BCa 95% confidence intervals. Thus, both bootstrap and the above tests (Welch and Forsythe tests) serve as an effective means to protect the type I rate α , and provides reliable results in one-way ANOVA.

Post hoc tests – Tukey’s method for multiple group mean comparisons

After ANOVA, Tukey’s post hoc test is carried out in order to explore the difference between the multiple group means. Using multiple comparisons method, all the possible group pairings are tested for their significance by limiting the family error rate to 5%. The results depicted through adjusted p values identifies the group comparisons that are significantly different. In the output below, the Tripoli-Ghadames ($p=0.000$) and Yefren-Ghadames ($p=0.020$) difference is statistically significant within the variable DT. Similarly, Tripoli-Ghadames ($p=0.001$) and Ghadames-Yefren ($p=0.012$) mean differences are significant within DG. The results show that only Tripoli-Ghadames ($p=0.000$) difference is statistically significant in BIG. However, Tripoli-Ghadames ($p=0.050$) and Tripoli-Yefren ($p=0.001$) exhibits low p values and are statistically significant in BIY.

CONCLUSION

The visual built environment of cities is the result of architectural action/design influenced by the ideologies of a number of marketing trends. These trends drive architects’ creative thinking away from understanding and achieving end-user’s satisfaction. Architects design to satisfy the requirements and applications of ideologies advocating the global image of architecture, rather than the inherent image of the locale. Thus, a conflict exists between global and local identity in the design of new buildings.

Architecture is a cultural phenomenon. Naturally humankind identifies with the built environment. This identity is not a matter of choice or preference rather it is a psychological process

that must be carefully addressed by architects when designing new buildings. The debate between architects who want to create new buildings based on traditional local architecture and those who reject the cultural past in their designs is in fact unbalanced since it ignores and excludes the long history of human interaction with the place.

We have introduced a model of new school of thought for architectural design creative process. We exposed the mechanism of designing for a brand of a place and how PCP methodology can be useful to understand the systems about how professional and non-professional members from a society/locale construe their meanings to architectural images. We argued that PCP can be a useful methodology to understand construction systems with regards to architectural meanings.

An innovative mixed methodology in the field of meaning in architecture allowed for the collection of quantitative and qualitative data enhancing the reliability of the results. The combination of constructs and stimuli as techniques to elicit people’s responses was found to be very effective without the loss of quantitative data. Additionally, the analysis opens doors to investigate aspects focused on a single element, construct or grouped analysis between different elements or constructs. The concept of PCT within the built environment executed through RGT is significant as it offers architects with a means to transfer/combine visual aspects within the platform of statistics.

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APPENDIX A

Description of factors represented by the elements

A description of the factors represented by the photographs used as elements is described below:

Factor 1: *Represents the Local Image*

Three photographs were chosen as representative of Di Fausto's Neo-traditional architecture (brand design) from each of the cities of Tripoli, Ghadames and Yefren (Figures 1 a, b and c). These buildings represented the final product of a brand design process and used architectural elements from vernacular architecture that existed in the same locale. The selection was made due to their effective correspondence to the concept of brand design.

Factor 2: *Represents the Brand Image*

In order to represent vernacular architecture from each city, two photographs were selected from each city to measure people's response to the brand image of their locale and the relationship with Di Fausto's buildings (Figures 2 a to f).

Factor 3: *Represents the Foreign Image*

Three photographs represented existing foreign buildings was selected one from each city; two representing international style of architecture and the third Middle Eastern mosque (Figures 3 a, b and c). The architectural characteristics of each building had no relationship to vernacular architecture.

Factor 4: *Represents the New Image*

Three buildings designed by global architects influenced by a critical regionalism approach, represented new images that none of the participant was expected to be familiar with (Figures 4 a, b and c). These buildings were claimed to be based on a regional identity and in reference to past architectural images. Buildings outside Libya exhibited a cultural sharing of architectural images.

Factor 5: *Represents the Ideal Image*

The thumb up served as a benchmark for assessing perceptions based on people's response to the buildings in the photographs (Figure 5). This graphic was used as a reference to their ideal building.

<p>Figure 1: Local Im- age</p>			
	(a) 'Di Fausto Tripoli'	(b) 'Di Fausto Ghadames'	(c) 'Di Fausto Yefren'
<p>Figure 2: Brand Im- age</p>	<p>Vernacular Architecture</p>		
		(a)'Vernacular Architec- ture Tripoli 1'	(b)'Vernacular Architec- ture Tripoli 2'
			
		(c)'Vernacular Architec- ture Ghadames 1'	(d)'Vernacular Architec- ture Ghadames 2'
			
		(e)'Vernacular Architec- ture Yefren 1'	(f)'Vernacular Architec- ture Yefren 2'
<p>Figure 3: Foreign Image</p>			
	(a) 'Foreign Tripoli'	(b) 'Foreign Ghadames'	(c) 'Foreign Yefren'
<p>Figure 4: New Image</p>			
	(a) 'Hadid' Tripoli	(b) 'Foster' Abu Dhabi	(c) 'Gehry' Abu Dhabi
<p>Figure 5: Ideal image</p>			
	'Ideal Building'		

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