

ASSESSING LIVABILITY OF PUBLIC SPACES IN GATED AND UNGATED COMMUNITIES USING THE STAR MODEL

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ABSTRACT

Public space plays a key role in building sustainable livable cities. It is the arena for neighbors' interactions, and several activities which when presented successfully may dramatically affect the community's sense of locality. Several approaches have been implemented to measure the livability of public space, yet the star model presents the first quantitative approach. The star model mathematically assesses the livability of open spaces through measuring five main dimensions (ownership – control – civility - physical configuration - animation). The current study aims to implement the star model in assessing livability of public spaces in Egyptian contexts. It uses observations alongside with interviews to assess two public spaces in Cairo, Egypt. The first one is located in a gated community and the other in an un-gated one. This would enable to understand the effect of the type of community (gated-un-gated) on public spaces. The study uses an evaluation sheet to calculate a numeric value for each of the 19 indicators used to calculate the five themes of the star model for the two case studies. The analysis of the case studies results presents a new step towards better understanding of assessing and designing more successful public spaces in Egypt.

KEYWORDS: Ownership, control, civility, physical configuration, animation.

1. INTRODUCTION

Public space presents an essential part of any built environment. It is the arena for all the activities that might happen in any community, which affects the community sense of belonging. That is why understanding the livability of a public space and determining the main elements of successful public spaces are of great importance to urban designers.

In recent years, Cairo witnessed a boom in designing and building gated communities. Such trend appeared since mid-90s. However, in the past decade such trend grew rapidly to become the dream of most Egyptians to own a villa or even an apartment in one of the luxurious gated communities. The bloom of gated communities in Cairo has

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been an interest of several researchers in the field of sociology and urban design [1-6]. Such researches were interested to investigate the reasons behind the rise of gated communities, their effect on several aspects: social, political, and economical.

The current study aims to assess livability of public spaces. It starts by reviewing the literature about different ways to assess public spaces livability. Building upon such researches the current research studies the livability of public spaces and its impact as a key-factor in the rapid growth of the urban development. The key-question that motivate the study "Does every public space can promote livability or not". Then it applies the star model alongside to observations, to assess the livability of two different public spaces one present in a gated community and the other in a regular mixed use area. The current study would contribute in identifying numerically the assessment of livability.

2. OPEN SPACE AND LIVABILITY

Urban design is concerned with not only designing the urban setting as physical elements, but also as vessels to accommodate human activities. Open space represents one of the most important elements of the built environment as it is the arena where different users interact and perform their various activities [6]. Public space is any place that is open to people without fees. It includes several spaces as; beaches, roads, squares, etc. With the rise of privatization and the awareness of people rights to use different facilities. The spatial temporal dynamics of this public space change by time and can accommodate many activities [7]. Public spaces and the concept of livability attracted the attention of several researchers and scholars [8]. The scope of such researches covers a wide spectrum of topics ranging from politics of public space, using public space to create life, to public space and social justice [8-10]. Researchers argue that understanding livability of public space is an initial and essential step into creating successful and nourishing spaces [11-13]. The next section presents some of the most important attempts to assess the livability of public spaces.

3. ASSESSING LIVABILITY

The literature of assessing livability of public spaces includes several attempts. Among the most developed attempts are: "The initiative attempt", "The methodology for

measuring security of publicly accessible spaces” [14], “The tool kit for assessing the success and failure of public spaces” [15], and “The star model” [11, 12].

The initiative attempt focused on one aspect of public space, which is management. Although it did not capture all the aspects of public space yet it is very important as it represents the first attempt to quantify the aspects of public space [14]. In their model (methodology for measuring security of publicly accessible spaces), Nemeth and Schmidt did not capture the multi-dimensional aspects of public spaces as they focused on control [15]. CABE proposed the space shaper tool, which assesses the quality of a space through the perception of certain number of people. Using the perception of people as the main tool to assess the space make it somehow a subjective model and thus less reliable [16].

One of the most developed models is the star model [11]. The current study focuses on the star model. The reason behind this choice is that it provides measurable and easy tool to assess and compare livability in different spaces. The following section presents an overview of the star model and how it is used to assess the livability of public open spaces.

3.1 The Star Model

Varna, G. created an analytical model to assess the livability of open public spaces. The model uses simple and measurable tools to provide an easy and reliable model to assess livability of open public spaces. Such simplicity makes it usable by academicians, designers as well as regular people with no professional background of urban design. The star model focusses on the aspects related to the publicness of public spaces in assessing livability. The model contains five main dimensions (Meta-themes): ownership, control, physical configuration, animation and civility. There are 19 indicators related to the five meta-themes as shown in Fig. 1. Varna, G. uses a five scale to measure each of the nineteen indicators of the star model, where 1 is the lowest and 5 is the highest [11]. The following section provides a brief overview of the five meta-themes of the star model.

Star model is useful in quantifying the quality of urban space on 3 main levels: [12]

- 1- For comparative purposes: Its primary value is to present pictorially the degree of livability of one public place vis-a-vis another.
- 2- For producing analytic and normative/perceptual stars: The Star Model is also useful as a more objective measure of livability to be compared and contrasted with the sense of livability held by specific social groups and individuals.
- 3- For further expectations: The Star Model also serves as a departure point for deeper investigations of certain spaces.

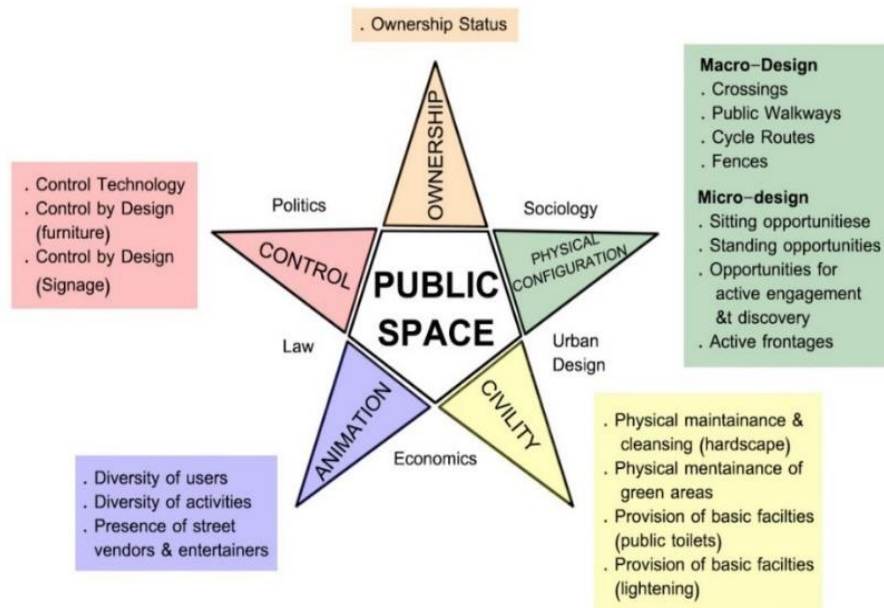


Fig. 1. The Star model, adopted from [11].

3.1.1 Ownership

Ownership is concerned with who owns the place. The ownership of public spaces can range on six levels. The first level represents spaces used by the public for a public function and owned by a public sector. The second level where a place is of administrative use and public function and owned by a public sector. The third level, is owned by a public sector and has a public function but private use e.g. café terrace. In the fourth level, the space has a private ownership, while the function and use are public (e.g. bus station). The fifth level has private ownership and function but public use (e.g. café-restaurant). The sixth has private ownership, function and use (e.g. home) [13, 14]. To calculate the ownership, the place is divided into different areas. The ownership of each

area is then calculated and multiplied by its percentage. Then the sum of the results are added. (e.g. total place ownership = (area A's % * area A's ownership rate + area B's % + area B's ownership rate + area C's % + area C's ownership rate) [9,12,13].

3.1.2 Control

“Control refers to the different measures taken to limit the individual freedom and the political manifestations of the members of a certain social group, when they are present in a public place” [11]. It is calculated through the assessment of three indicators. The first is control technology which is concerned with the devices used to record the security of the space, e.g. CCTV cameras [14-15]. The second, control by design (sadistic furniture) is concerned with the presence of street furniture that does not allow doing certain activities (such as lying down on benches) [16]. The third, control by design (signage) is concerned with the presence of signage that prohibits certain activities (e.g. no smoking sign) [11].

3.1.3 Physical configuration

“Physical configuration refers to the physical characteristics of a public place as a part of the built environment” [11]. Physical configuration is calculated on two levels; macro design and micro design. Physical configuration on the macro design level is calculated through assessing four indicators; crossing, public walkways, cycle routes, and fences. Physical configuration on the micro design level is calculated through assessing four indicators; sitting opportunities, walking opportunities, opportunities for active engagement and discovery, and active frontage [11-17].

3.1.4 Animation

“Animation refers to the practical expression of human needs in public places – to the actual use of a place” [11]. Animation is concerned with the diversity of users and activities present in the place. Animation is calculated through assessing three indicators; diversity of users, diversity of activities, and presence of street vendors or entertainers. Rating these three indicators is usually done through observing the place (users specially kids and activities) [17-20].

3.1.5 Civility

“Civility refers to the overall cleanliness and tidiness of a public place” [11]. To calculate civility, the cleanliness & tidiness is assessed through rating four indicators. The first indicator is physical maintenance and cleansing which is concerned with the cleanliness and tidiness of the place and its hardscape and furniture. The second indicator is physical maintenance and provision of green areas, which is concerned with the cleanliness, tidiness and general condition of green areas.

The third and fourth indicators are the physical provision of basic facilities, where the third is concerned with the availability of public toilets, while the fourth is concerned with the availability and condition of lightening [9, 17].

4. METHODS

The first part of this research reviewed the literature regarding open space and different ways of understanding and assessing the livability of public open spaces. Building upon the first part, the research uses a quantitative approach –using the star model- to assess and compare two case studies in Cairo Egypt.

The first case study (The West Town Hub) is located in a gated community (Sodic west). The second case study (Americana Plaza) is located in district two AlSheikh Zayed. The reason behind the choice of these case studies is to shed some light on the difference between the presences of the public open space in a gated community verses in a regular non-gated area.

To assess the two case studies, the research calculate a numeric value resulting from the average of the measure of each of the five themes of the star model (ownership-control-civility-physical configuration-animation). The study considers each of the five themes to be of the same relative weight. Each of the five meta themes is calculated using the related indicators (e.g. the value of animation is calculated through the average of the related three indicators: diversity of users, diversity of activities and presence of street vendors). Table 1 presents the detailed evaluation sheets used to calculate each of the 19 indicators and thus the five Meta themes.

Table 1. Calculating the 19 indicators of the star model.

Theme's indicators	5 High	4	3	2	1 Low
Owner-ship status	Public authority elected democratically	Governmental authority or public organization	Public-private partnership or joint venture	Administration	One or more private entity
CO1: Control technology: CCTV cameras	No cameras	Few (hard to see and cover less than half space)	Few (easily seen and cover less than half space)	Many cameras (hard to see and cover more than half the space)	Many cameras (easily seen and cover more than half the space)
CO2:By design: Sadistic Street Furniture	No cameras	Present of one element (in one or two places)	1 to 2 elements (in less than half the space)	1 to 2 elements (in more than half the space)	More than 3 elements in the entire space
CO3: Control by design: Signage	No cameras	1 or more sign preventing 1 behavior	1 or more sign preventing 2 behaviors	1 or more sign preventing 3 behaviors	1 or more sign preventing more than 3 behaviors
PC1:Macro Crossings	Present in all directions	Present in 3 directions	Present in 2 directions	Present in one direction	None
PC2:Macro Public walkways	Connected on all directions	Connected in 3 directions	Connected in 2 directions	Connected on one direction	None
PC3: Macro cycle routes	Connected by cycle routes in all directions	Connected by cycle routes in tree directions	Connected by cycle routes in two directions	Connected by cycle routes in one direction	Not connected by cycle routes in any direction
PC4: Macro fences	None	All around but lower than the average person or high but see through points in all directions	All around but lower than the average person or high but see through points in tree directions	High opaque fences surrounding the place with viewpoints in 3 or four directions	High opaque fences surrounding the place with viewpoints in one or two directions
PC5: Micro Sitting Opportunities	More than 2 comfortable sitting opportunities present along the edges	Presences of benches and other sitting opportunities along the edges (but not comfortable)	Presence of comfortable sitting opportunities in one or two areas of the place	Presence of non-comfortable sitting opportunities in one or two areas of the place	None

Table 1. Calculating the 19 indicators of the star model, (Cont.).

Theme's indicators	5 High	4	3	2	1 Low
Micro Design Walking Opportunities	Even and easily walkable along the entire space	More than 75% of the space has even and easily walkable surfaces	From 50% to 75% of the space has even and easily walkable surfaces	From 25% to 50% of the space has even and easily walkable surfaces	Less than 25% of the space has even and easily walkable surfaces
PC7:Micro Design Active engagement	Presence of more than 3 different elements	Presence of three different elements	Presence of two different elements	Presence of one element	None
PC8:Micro Design Active Frontage	Depth of building surface and several details in façade	Some depth in building surface and several details in facades	Little depth in building surface and few details in facades	Flat building surfaces, facades with few details	Facades with no details, and flat surfaces
Maintenance and Cleansing	Clean and well maintained nothing broken	Generally clean (slight signs of wear)	Less than 50% of the place is dirty and untidy	From 50% to 75% of the place is dirty and untidy	More than 75% of the place is dirty and untidy
Green Areas	Tidy – trimmed	Tidy (signs of wear)	Deteriorated (broken – unhealthy)	Deteriorated (overgrown– untidy)	None
Toilets	Free access- well maintained – easy to find	Free access not well maintained easy to find	Free access well maintained hard to find	Not well maintained hard to find or paid access	None
Lighting	All site well lit	More than 75% of the place well lit (1 to 2 dark areas)	About half the space well lit (several dark areas)	About 25% of the place well lit (generally dark)	Only 1 to 2 lights in the place (generally dark)
A1: Diversity of users	Diverse users all over the place all the time				1 to 2 types of users
A2: Diversity of activities	Diverse activities all the time				Only I kind of activities
A3: Presence of street vendors	Present all over the place all the time	Present 4 to 6 times/year all over the place	Present 2-to 4 times in certain areas	Present 1 to 2 times a year in certain areas	None

It is worth mentioning that although the star model offers definite indicators, but the model should be used with a certain degree of common sense as some of the

indicators still needs judgement from the researcher/observer. Accordingly, the current study undertake structured observations. The observations were done for seven days for each site in the winter of 2019.

5. CASE STUDIES

5.1 West town hub (gated community)

West town hub is a public space located in one of the largest gated communities of Egypt (Sodic west gated community) as shown in Fig. 2. West town hub accommodates several retail and recreational activities. It represents a magnet for Al-Sheikh Zayed residents along with users from all over Cairo.

5.2 Americana plaza (open community)

Americana Plaza is a public space located in district two in Sheikh Zayed city as shown in Fig. 3, few minutes away from 26 of July corridor. Americana plaza accommodates several uses including; retail, restaurants, cafes, cinema, and a kids indoor playing area. It represents a magnet for Al-Sheikh Zaid residents along with users from all over Cairo.

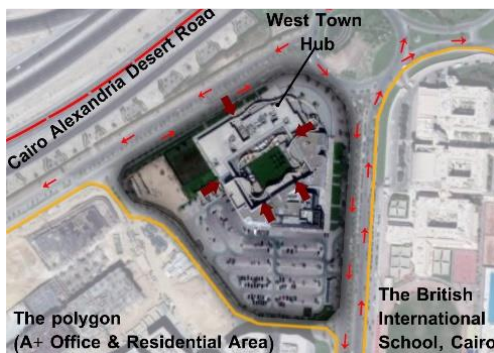


Fig. 2. West Town Hub.

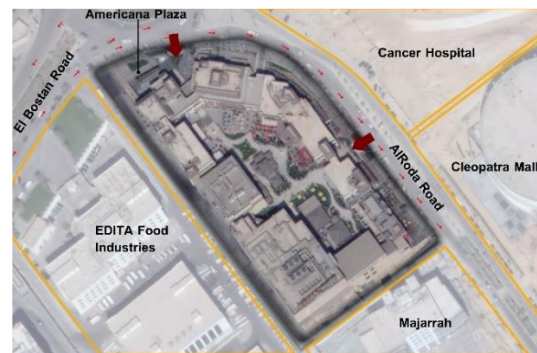


Fig. 3. Americana Plaza.

6. DISCUSSIONS

The following sections present the discussions of the results of the two case studies.

6.2 West town hub (gated community)

Ownership is rated 2 for west town hub because it is a building type administration

owned by SODIC west real-estate Company. The overall rate for control is "4.7".

The first indicator control technology 4, where two cameras are located one covering the main entrance and the other covers the parking area as shown in Fig. 4.



Fig. 4. Security points and CCTV at the parking area.

The second indicator control by design (furniture) was rated 5 as there are no sadistic furniture elements. The third indicator control by design was rated 5 as there are no control signs present. Physical configuration overall rate is "3.8". For the macro design the first indicator crossings was rated 5 because well designed crossing area are present in all the directions of the site. The second indicator public walkways was rated 5 as the place is connected to the public walkways from all directions. The third indicator cycle routes was rated 2 because the place is connected by cycle routes from one direction. It is worth mentioning that cycles are recognized all over Sodic West yet not all the roads contains a designed cycle route. The fourth indicator is rated 5 as there are no fences as shown in Fig. 5.



Fig. 5. Absence of fences either on the exterior or on the court edges.

For the micro design, the first indicator sitting opportunities was rated 5 due to the presence of adequate number of sitting areas varying between metal benches located at southern side of the court and built-in benches all around the periphery of the court as shown in Fig. 6.



Fig. 6. Sitting opportunities: metal benches and built in seats along the court periphery.

The second indicator walking opportunities was rated 5 as the place have even and easily walkable surfaces. The third indicator opportunities for active engagement and discovery was rated 4 due to the presence of three elements for active engagement (the dancing fountain, a landmark at the main entrance which change according to the season as shown in Fig. 7, and another landmark at the back entrance). The fourth indicator was rated 5 due to the presence of many premises all over the facades (mainly cafeterias).



Fig. 7. The change in the landmark according to changing seasons and events.

Animation was rated 2.7. The space accommodates several users; the compound residents, outsiders, shop owners and workers and security guards. Accordingly, the first indicator diversity of users was rated 3. The second indicator diversity of activities was rated 2. The third indicator which is the presence of street vendors or entertainers is rated 3, as shown in Fig. 8, as street vendors are present all over the place but only when seasonal activities are present as; winter festival, Halloween, etc.



Fig. 8. The presence of the street vendors during the spring festival.

Civility is rated 4.3. The place is clean and spotless all the time, thus the first indicator (physical maintenance of hardscape and furniture) was rated 5. There are few greens present at the periphery of the court. They are healthy and well maintained, thus the rating for the second indicator was rated 5. A public toilet is present. It is clean, well maintained, and free to access but not easily found. Thus, the third indicator was rated 3. All areas of the place are well lit, thus the fourth indicator was rated 5 as shown in Fig 9.



Fig. 9. Provision of public facilities: public toilets (behind the stairs), and lighting.

6.2 Americana Plaza (open community)

Ownership is rated 2 for Americana Plaza because it is a building type administration owned by Americana Company. The overall rate for control is "5". The first indicator control technology was rated 5 as no CCTV camera is noticed in the place. The second indicator control by design (furniture) was rated 5 as there are no sadistic furniture elements present. The third indicator control by design was rated 5 as there are no control signs prohibiting parking in the front area as shown in Fig. 10.



Fig. 10. Security check points at entrances.

Physical configuration overall rate is 3.3. For the macro design the first indicator crossings was rated 3 because well designed crossing area are present only in two directions (towards El-Bostan road, and Al-Radwa road. The second indicator public walkways was also rated 3 as the place is connected to the public walkways only from two directions (also El-Bostan road and Al-Radwa road) while the other two directions are blocked due to the presence of private companies. The third indicator cycle routes was rated 1 because the place is not connected by cycle routes from any direction. The fourth indicator is rated 5 due to the absence of fences either on the facades or in the court space as shown in Fig.11.



Fig. 11. Absence of fences in the inner court and the façade.

For the micro design, the first indicator sitting opportunities was rated 4 due to the presence of benches along the edge of the court and at the main entrance, but the number of benches is not adequate as illustrated in Fig.12.



Fig. 12. Sitting opportunities at the main entrance and along the court periphery.

The second indicator walking opportunities was rated 5 as all the place have even and easily walkable surfaces.

The third indicator opportunities for active engagement and discovery was rated 4 due to the presence of three elements for active engagement (the dancing fountain, a landmark at the main entrance which change according to the season and special occasions as shown in Fig. 13, and another landmark at the back entrance).



Fig. 13. Even and easily walkable surfaces and elements of landscape.

The fourth indicator was rated 5 due to the presence of many premises all over the facades based on their function (mainly cafeterias). Animation was rated 2.7. The space accommodates several users; visitors, shop owners and workers and security guards. Accordingly, the first indicator diversity of users was rated 3 as shown in Fig. 14. The second indicator diversity of activities was rated 2 while the third indicator was rated 3.



Fig. 14. The presence of street vendors at different events.

Civility is rated 4.3. The place is clean and spotless all the time, thus the first indicator (physical maintenance of hardscape and furniture) was rated 5. There are few greens present at the periphery of the court. They are healthy and well maintained, thus the rating for the second indicator was rated 5. A public toilet is present. It is clean, well maintained, and free to access but not easily found. The third indicator was rated 3. All areas of the place are well lit, thus the fourth indicator was rated 5 as shown in Fig. 15.



Fig. 15. Provision of public facilities (public toilets and lighting).

Applying the star model on the two case studies (West Town Hub and Americana Plaza) did not show distinctive difference as shown in Fig.16. Both spaces received the same results in ownership and animation. A small difference existed in civility and control results. Americana Plaza received slightly higher results in control than West Town Hub, due to the absence of CCTV cameras. Same for civility where Americana Plaza received higher results due to the presence of clean, free access, and easy to find toilets. Physical configuration was the only theme where American Plaza received slightly lower results than the West Town Hub.

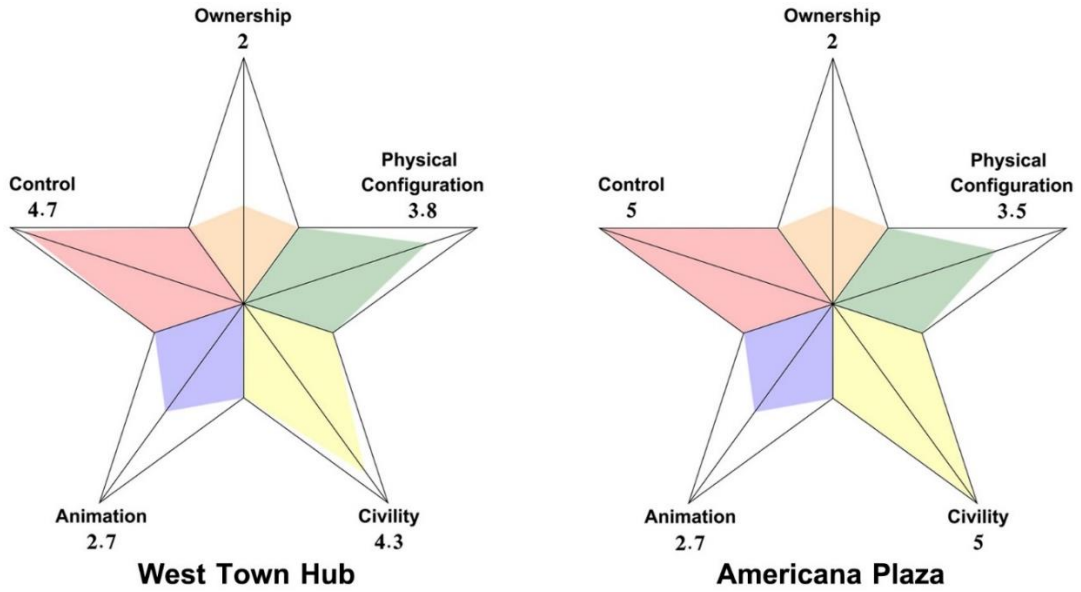


Fig. 16. The star diagram for West Town Hub and Americana Plaza.

Yet the observation showed more information and differences in the results of the two spaces. For instance, being inside a gated community lowered the results of the West town hub in many aspects that the star model failed to capture. The user of space has to pass from the compound gates and check points, then they pass through the check points at the entrance as shown in Fig. 17.



Fig. 17. Barriers at the street before reaching the West Town Hub.

On the contrary for Americana Plaza such restriction is not present as it is not located in a gated community so users only pass through the entrance check point.

Interviewing the users of space (the compound residents and outsiders) showed that the compound residents are trying to limit the access of West town hub to the compound residents only, which if applied will lower the space livability to a great extent. Yet this declination can not be captured if assessed with the star model only.

7. CONCLUSIONS

Understanding and assessing livability is an important step towards designing better public spaces. The star model represents a big step into measuring and quantifying the livability of public spaces. The model proposes five meta-themes with nineteen related indicators. Each indicator is rated on a scale from one to five, with specific criteria for rating each indicator (as mentioned in table 1). Such level of details make it easy to understand and use, which widens the scope of the model users from researchers and urban designers and planners to regular people without background knowledge in the field. Such indicators also makes it easier to reach a reliable assessment of livability of public spaces.

The Star Model has some weaknesses include its standardization of public places, removing the fact that each public place has its own identity and atmosphere, so the model should be used with a certain degree of common sense. Another weakness would be related to its containing a certain degree of subjectivity in selecting and defining the meta-themes, the indicators, the measurement range and their illustration. Another big limitation of the star model lies in the fact that it does not address important non-physical aspects such as feelings of security, belonging, interest, calmness, etc. Also, the dynamic of space (change of function/activity in space in time) is not addressed in the star model, although it is an important factor in the success of open spaces.

8. RESEARCH LIMITATIONS

The star model has some weaknesses include its standardization of public places, removing the fact that each public place has its own identity and atmosphere, so the model should be used with a certain degree of common sense. Another weakness would be related to its containing a certain degree of subjectivity in selecting and defining the meta-themes, the indicators, the measurement range and their illustration.

The star model has only been tested in Glasgow, Scotland (Varna, 2011) and Turku, Finland (Varna, 2013).By applying the star model on certain Egyptian public spaces, yet another limitations were add of the star model lies in the fact that it doesn't address important non-physical aspects such as the nature of users and there culture

aspects and feelings of security, belonging, interest, calmness, climatic changes from one place to another, etc. Also, the dynamic of space (change of function/activity in space and time) is not addressed in the star model, although it is an important factor in the success of open spaces.

9. FUTURE RESEARCH

The current study suggests the need of future research to work on adding such aspects to the model to enhance the weaknesses listed above. This would enable comparison of the developed model and the current model with other tools. These tools include questionnaires, interviews and observations to address the change of users and its impact on the sense of livability. The star model may then be applied more than one time through the day to investigate the effect of activity dynamics. There is also a need to further investigation of the effect of gated communities on space livability especially with the blooming of such settlements in Cairo.

DECLARATION OF CONFLICT OF INTERESTS

The authors have declared no conflict of interests.

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تقييم الشعور بعامية الفراغات العامة في كل من المجتمعات العمرانية المغلقة وغير المغلقة باستخدام نموذج النجمة الكمي

يهدف البحث إلى تطبيق نموذج النجمة في تقييم الشعور بالعامية في الفراغات العامة بداخل المجتمعات المغلقة وغير المغلقة، حيث تم اختيار فراغات عامة مختلطة الاستخدام يقع واحد منهم في مجتمع مسور(مغلق) والآخر في مجتمع غير مسور، لفهم تأثير نوع المجتمع (مسور/غير مسور) على الشعور بالعامية في الفراغات العامة، وتعد تحليل نتائج البحث خطوة جديدة نحو فهم أفضل لتقييم وتصميم الفراغات العامة الأكثر نجاحًا في مصر.