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Sovereignty Over the Streets: Understanding of the Use of Mosquito Device in the Streets by the Application of the Space Syntax Method

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ABSTRACT

Providing sovereignty over the streets evolves by the use of different apparatus. From the past to the present, sovereignty over the streets was provided via different forms, with the use of towers, radial urban plans, illumination, cameras and mosquito devices. Of all those employed, the mosquito device, which was introduced recently, emits sound for providing sovereignity. Research was carried out on the mosquito devices, which are generally used in transportation hubs, to understand how can they affect the street network by using the space syntax method. The Galata-Karakoy district of Istanbul was chosen as a plot area for the field study and the mosquito device was assumed to be placed in the transportation hubs in this area. As a result of the analyses made, the values of connectivity, local and global integrations in the street network were seen as decreased. The affect of the mosquito devices on the flow in the streets was discussed.

Keywords: Sovereignty, Street pattern, Mosquito Device, Space Syntax, Galata, Karakoy

INTRODUCTION

Providing sovereignty over the streets by a particular community or the authorities has been ongoing for many years. Different methods such as the use of towers, radial urban plans, illumination and cameras are seen to provide power over the streets. The common feature of these methods is to provide power by the authorities without confronting the people. Thus, with this control mechanism, there is no interaction and discussion between the authorities and the citizens. This situation has been termed as "silent agents" by Savicic and Savic (2014). Agamben (2009) also examines agents of this type under the apparatus concept.

For many years, the method has been based only on surveillance. Subsequently, the intention was to provide sovereignty by affecting the people's senses. In recent years, it is noteworthy that the mosquito devices, which make an unsettling noise, are used at the fronts of shops, in public spaces, in courtyards and mostly in transportation hubs, usually to prevent teenagers loitering and to disperse youth gatherings. These controversial devices, which are used to provide social control, are generally ignored in terms of how they influence the flow of pedestrians in the street. However, it is important to remember that the use of these devices in streets differs from the surveillance-based methods and can more greatly affect the flow of the street population.

EVOLUTION OF SOVEREIGNTY OVER THE STREETS

Towers

The authorities have always attempted to retain sovereignty over the streets. In the period of the decline of Western Roman Empire, the cities were surrounded by walls, and the towers which were built for military purposes. As a result of enhancing the visual field, the towers create a natural telescopic sight for those viewing from them. Therefore, the viewers in the tower have privileged spots from which they can observe events in the streets.

In the Panopticon prison model, which was designed by English philosopher and social theorist Jeremy Bentham in the late 18th century, the same principle was also applied. In this model, an observation tower was placed at the centre so that prisoners could be watched from it. The presence of the tower in the center of Panopticon also automatically provides sovereignty over the prisoners, since they are aware of the fact that they are being watched all the time (Foucault, 1977). The prisoner, who can be seen, is a sign of control (Koskela, 2000).

The Panopticon-like urban structure can also be seen as a laboratory of the sovereignty. As Foucault (1980) notes, there is no need for physical power or restriction: it is only necessary to create the feeling of being watched to establish control. The control is internalized by feeling constantly monitored by unseen observers (Koskela, 2000).

Radial plans

This observational principle was applied for a long time via making physical changes in cities. For example, the radial plan is a very suitable tactic for an observation to be made at a particular point, especially in military terms. This makes it possible for the streets to be well monitored in the event of a possible invasion by an enemy. In the radial plan, which is seen in many European cities, the square and many roads connected to the

square intersect with the logic of Panopticon. Here, the tower at the Panopticon is present as the square of the radial plan.

The application of the radial plan in the road system developed by Haussmann for Paris, as a proposal for a new road system for the present urban tissue was the first of its kind, and triggered other similar applications. When this application is implemented, the opening of new lines in the existing urban tissues is referred to as "Haussmannization" in urbanism (Kostof, 1991; Panerai et. al., 2004).

Illumination

Continuous and intensive lighting is also used to provide sovereignty over the streets. By this strategy, it is attempted to prevent undesirable and suspicious behaviors during the hours of darkness (Narisada and Schreuder, 2004). When the light is bright, a person using the street pays attention to his actions since he is aware of his visibility. Hence, this situation also intersects with the Panopticon logic. Savicic and Savic (2014) refer to the use of strong illumination in the case of social housing blocks in Dutch cities, which have their hallways and corridors permanently illuminated. "However, besides the need to create a defensible space, there is an expectancy of a certain level of intimacy in a residential environment which this strong illumination works against" (Savicic and Savic, 2014).

Another example is the pink lights that are used to solve the teenage loitering problem in Mansfield, UK. It is claimed that the pink light highlights the skin blemishes of teenagers, which discourages them from gathering together (Savicic and Savic, 2014).

Cameras

The other example of continuous control by unseen people is, as Jane Jacobs (1961) has referred to, the 'eyes' on the streets. Jacobs tells us that there are eyes in the streets and districts. The eyes, which are a monitoring group, provide safety and dominance by watching the street or a certain crowd entering or leaving the area (Jacobs, 1961). Therefore, the eyes are actually individuals who dominate a certain area, and these change according to technological development. Today, there are cameras present in the streets to maintain sovereignty. These cameras create the state of the Panopticon since people feel that they are monitored by them.

In recent years, a surveillance mechanism has been established in the cities, especially with the use of cameras in urban areas. With this surveillance mechanism, some advantages have been created, such as reducing the crime rate, meeting the need to

provide evidence in matters of justice, and providing rapid response in emergency situations. Recently, this surveillance mechanism has been augmented by adding facial recognition and motion tracking. When we look at the relationship between the city and the street, it can be seen that these surveillance mechanisms, up to now, are not sufficient to affect the flow in the streets.

Mosquito Device

The most recent example regarding sovereignty over the streets is provided by the use of Mosquito Devices. Today, Mosquito Devices are generally used to prevent teenagers from gathering in such places as street corners, courtyards and shopping malls (Savicic and Savic, 2014). These devices affect the flow of people in the city since they emit a disturbing sound that leads young people especially to keep away from the streets and public spaces. The Mosquito Device has two frequency settings, one at 17.4 kHz which can only be heard by young people, and another at 8 kHz that can be heard by most people. So the mosquito devices can be used in cities not just for young people to keep away from the streets, but also for everyone. Although some studies have been made in different countries in regard to putting restrictions on the use of the Mosquito Device, there is no legal restriction in place, as yet.

METHODOLOGY

In order to understand the effect of the use of Mosquito Devices on the street network, a case study was considered which used the space syntax method. The Galata and Karakoy districts of Istanbul were chosen as plot areas for this study. This region has remained, in particular, as a commercial, historical and touristic center in Istanbul for many years (Agirbas and Ardaman, 2015).

The Galata and Karakoy regions are located to the southwest of the Bosphorus and to the north of the Golden Horn. The region is rich in terms of transportation connections, and the Galata Bridge, Karakoy pier and Karakoy-Beyoglu subway are present in this area, through which the Kabatas-Bagcilar tram additionally passes.

As with all cities, there is a lack of knowledge about where exactly Mosquito Devices are being used. Therefore, it is assumed that there are Mosquito Devices that affect the flow of people on the transportation hubs in the plot area, and accordingly, the Mosquito Devices are placed on the map of it. Since mosquito devices are used most often in transportation hubs, it is assumed that mosquito devices are installed in transportation hubs. The places where Mosquito Devices are placed are considered as borders (like a wall or barrier) in the region, and an axial map for space syntax analyses is prepared

according to the recreated map. Accordingly, axes in the transportation hub parts on the recreated map were eliminated empirically in the axial map, since the walking route of pedestrians would change or the pedestrians would seek alternative routes. Thus, it is thought that the change in the street network could be generally observed.

The space syntax method, which was developed by Hillier and Hanson, is used for quantifying spatial configurations in cities (Klarqvist, 1993; Hillier, 1996; Psarra, 2003; Ozbil et al, 2011; Jeong et al, 2015). Axial maps, which are prepared specifically for the selected site to use in space syntax analyses, can be used for both global and local analysis. In other words, space syntax analysis can be performed by using different radii according to the character of the selected field (Barros et al, 2014). In this study, it was found appropriate to make a local (R3) and global (Rn) analysis for the integration.

Then, connectivity and integration analyses through the application of the space syntax method were made using the recreated map (with Mosquito Devices), and these analyses were also done by using the original map (without Mosquito Devices). By comparing these analyses, the ways in which the use of such devices affecting the city were demonstrated, as we later discuss.

RESULTS

Since the Mosquito Devices were usually installed in the transportation hubs (the examples are present), it was assumed that they were installed in the transportation hubs of the Galata and Karakoy districts. Specifically, it was assumed that the Mosquito Devices were located, at the Karakoy exit of the Karakoy-Beyoglu subway, the Beyoglu exit of the Karakoy-Beyoglu subway, the ferry pier at Galata side and the ferry pier at Karakoy side.

When the Mosquito Device was assumed to be placed at the Karakoy exit of the Karakoy-Beyoglu subway, the related street and its surroundings were seen as being affected. In the Local Integration (R3) analysis, the value of a part of Tersane Avenue near to the Galata side, and the value of a part of Tersane Avenue near to the Karakoy side directly related to the area where the Mosquito Device was assumed to be placed, and the value of Necatibey Avenue were all seen to be reduced. This indicates that the local integration is decreased (Figure 1, Figure 2). In addition, we see that the global integration values of these streets (Tersane Avenue, Necatibey Avenue) have also decreased slightly (Figure 4, Figure 5, Table 1). Moreover, the connectivity was decreased only in the small area where the Mosquito Device was assumed to be placed and in the extensions of the street, where the connectivity value was observed to be unchanged (Figure 5, Figure 6). The

Mosquito Device, which was assumed to be located around the Beyoglu exit of the Karakoy-Beyoglu subway, also reduces the local integration in the area. At the end of Galip Dede Avenue, at Sah Kulu Bostan Street and at Erkani Harp Street, the local integration value was observed to decrease. In this region, where it was assumed that the Mosquito Device was located and which is intersection point of many different axes, the local integration was clearly decreased. In addition, we see that the global integration values of these streets (Galip Dede Avenue, Bostan Street and Erkani Harp Street) also decrease (Figure 4, Figure 5, Table 1). Since these streets are closer to Istiklal Street, the global integration values are seen to have fallen more than the other selected streets. Because, as seen in the analysis of space syntax global integration, it has been revealed that the spine of the region is Istiklal Street (red color) (Figure 3). On the other hand, while the value of the connectivity decreases in those streets that have a direct relationship, the value of the connectivity remains constant in those streets where there is no direct relationship (Table 1).

The Mosquito Device, which was taken to be placed near the entrance of the ferry pier in the Karakoy side, also reduces the local and global integrations in the area (Figure 1, Figure 2, Figure 3, Figure 4). The device obviously affects the Rihtim street where it was assumed to be placed. If we look at Kemankes Avenue, we can see that the local integration value remains constant but the global integration value is slightly decreased. When the connectivity is examined, it is seen that in the small peripheral area, where the device was considered to be placed, the connectivity was decreased and the surrounding streets remained unaffected (Figure 5, Figure 6). The Mosquito Device, which was assumed to be placed near the entrance of the ferry pier in the Galata side, also reduces the local and global integrations in the area. At the Fermeneciler Avenue, which is close to the area where the device was assumed to be placed (Table 1), the local and global integration values can be seen to be decreased.

Figure 1. Local integration (R3) without Mosquito Device

Figure 2. Local integration (R3) with Mosquito Device (The places, where mosquito devices are assumed to be replaced, are shown in red)

Figure 3. Global integration (Rn) without Mosquito Device

Figure 4. Global integration (Rn) with Mosquito Device (The places, where mosquito devices are assumed to be replaced, are shown in red)

Figure 5. Connectivity without Mosquito Device

Figure 6. Connectivity with Mosquito Device (The places, where mosquito devices are assumed to be replaced, are shown in red)

Table 1. The changes of connectivity, local and global integration values in the areas with and without Mosquito Devices

	Normal (without Mosquito Device)			with Mosquito Device		
Name of the avenue/street	Connectivity	Integration (R3)	Global Integration (Rn)	Connectivity	Integration (R3)	Global Integration (Rn)
Tersane Ave. (Galata side)	15	3.02878	1.04228	15	3.01347	1.04096
Tersane Ave. (Karakoy side)	17	3.41053	1.02877	16	3.37133	1.02784
Necatibey Ave.	10	2.85515	1.03773	10	2.83964	1.03759
The end of Galip Dede Ave.	5	2.07816	1.15321	3	1.65035	0.87603
Sah Kulu Bostan Street	5	1.99766	1.10333	5	1.83484	1.07230
Erkani Harp Street	3	1.64136	1.00505	3	1.48036	0.87184
Kemankes Ave.	4	1.90200	0.86081	4	1.90200	0.86038
Rihtim Ave.	3	1.47249	0.74757	2	0.72782	0.70313
Fermeneciler Ave.	5	2.03591	0.81624	5	1.99554	0.81539

CONCLUSION

In the present time, a sovereignty situation on the streets is created by means of impacts on human senses. The most up-to-date example of this is the use of Mosquito Devices on the streets. The use of such devices inevitably influences the flow in the streets. Because people, who regularly use those areas where Mosquito Devices have been installed, will begin to avoid them and will instead start creating alternative routes to them. With this in mind, the space syntax analysis was carried out and the results indicated that the connectivity, local and global integration values in the streets, where the Mosquito Device was assumed as being used, decreased. In addition, the local and global integration values were reduced not only in the streets where the Mosquito Devices were present, but also in the surrounding streets. In summary, the use of

Mosquito Devices is found to reduce the integration of streets with other streets and affect whole the street network. The next step of this empirical study may be to place the mosquito device in the selected areas, and to analyze the pedestrian's path choices and to define the regional effects after the various correlations.

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