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Divided shopping: A syntactic approach to consumer behaviour

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Abstract

Shopping is a socially interactive consumer activity that involves preference, selection and leisure. As historical city centres are still cores of traditional shopping and an asset improving social attraction, attractive routes and spaces for pedestrian movement provided by articulation in the setting are worth examining. Buildings on small sized plots located in a bounded environment usually encourage pedestrian flow, presenting more options of interest on a unit street scale; whereas spatial layout of the urban form, compactness of the circulation routes or visual scope of the users should also be examined.

This paper focuses on the comparison of consumer shopping behaviour in such a historical city centre, Walled City of Nicosia, the capital of Cyprus Republic and TRNC. Regarding the lost centrality due to the UN buffer zone, divided city has gone through different physical and social development patterns in terms of land uses and functional changes. Assuming that physical accessibility reinforces social and economic attraction, the paper deals with the,

- syntactic hints examined through line analysis underlying the physical development of the urban layout in three different periods of the city,
- preferences of the pedestrians, emphasizing functional and spatial pattern that orient the consumer behaviour.

The outcomes indicate that narrow long roads promote pedestrian flow in a movement based activity, while the curvy organic formed streets disperse pedestrian movement. Pedestrians tend to shop for retail based products in a linear layout, and tend to eat or drink in a dispersed organic layout. On the other hand, as an aspect of political curiosity both sides of the buffer zone also serve as attraction nodes regardless of the functions.

Keywords
Attraction, Historical urban core, Pedestrian behaviour, Shopping, Space syntax.

1. Introduction

In terms of user satisfaction, within time, historical city centres may fail to meet the needs and expectations of the occupiers; however, Lewicka (2008) argues that historical centres create a sense of continuity with the past, embody the group traditions and facilitate place attachment, as well. That is why even though there may unpredictable population fluctuations or major factors such as wars and regime changes occur, historical city centres are still cores of attraction and they struggle to maintain their vitality. Weltevreden et al., (2005) state that historic city centres are not competitive in terms of prices but they remain attractive as a retail location only if they are able to generate new sectors offering new products. When we think of attraction in the historic city centre, shopping facility as an attractor plays a major part, but on the other hand, inner cities are also places to meet people, socialise and recreate as Weltevreden and Rietbergen (2007) discuss. They add that attractiveness of an inner city depends on four factors; these are an environment with characteristic aspects such as being historical, or having an ambiance, a concentration of a large variety of functions other than shopping such as restaurants, theatres, museums, the amount and variety of shops, and lastly the crowdedness. Among these aspects, crowdedness issue is related with the number of pedestrians. Existence of a pedestrian flow is crucial for attracting social interaction, as Hillier (1999) emphasises that attraction plays an important role in drawing people to the city centres.

There are various researches which examined city centre activities through social attraction, for example, Portnov (1998) examined the social attraction in Siberian urban layout in three aspects, which were the general residential attractiveness, quality of physical environment and attractiveness for business activity. The outcomes of his research showed that perceptions of the professional specialists on spatial quality were different than of the city dwellers. While the specialists attach importance to access to city centre and recreational areas, dwellers attach importance to ecological and functional issues such as social facilities and services. Kemperman et al. (2009) on the other hand, emphasise that attractive downtown historic centres are recognised as potential magnets for tourist shopping. Tourists prefer links/streets that are physically attractive, having a good visibility, and are pedestrian friendly. They believe pedestrian movement is an important indicator of shopping behaviour and assume that tourist shopping behaviour is related to the motivation for shopping, the familiarity with the shopping area, and whether or not the shopping route was planned in advance.

Space syntax theory introduced by Hillier and Leaman (1974) use the term syntax to refer to rules that generate different spatial arrangements, in which spaces are considered to be shaped due to certain cultural considerations and these forms in return affect social relations in one way or another. As space syntax is defined as a methodology to represent, quantify and interpret spatial configuration and visual perception of exterior or interior spaces of various scales by means of convex shapes, and axial lines, (Hillier et.al, 1987; Peponis, 2000) it is necessary to briefly explain the terms used in this sense. Integration exposes the distance to a convex shape from all points within the system. If the real or global integration value of the shape is high, it means that reaching to this certain shape from any point within the system, is relatively easy and indirect. Connectivity refers to number of cells directly connected to a shape within the system. If the shape is located somewhere close to the centre of the system, then it means that the shape has many surrounding cells, thus increasing its integration. On the other hand, if the shape is located somewhere close to the outermost parts of the system, its integration value decreases, increasing its mean depth value (Edgu, 2003).

Therefore, factors such as relationship between the integration and connectivity of axial lines give ideas whether a town centre is an agreeable place with good vitality in the shopping streets (Hillier et al., 1993). Pedestrian's perceptions on physical characteristics

such as distance, building composition and urban pattern are important aspects of attraction. In the historical city centres, local's attraction as well as the tourist attraction can be provided by a good circulation of pedestrian flow supported by facilities like recreational gathering spaces and retail functions such as eating, clothing and such shopping. Ünlü et. al. (2009) suggest that regardless of its kind, the occupancy of a space can be determined with a function attached to it, and the reason of using a space can be related with socially attractive functions such as cafeterias, small shopping units. Thus, it is important to distinguish the reason of pedestrian gathering or movement within the historic urban core. Hatz (2006) suggests that unlike retailing in US downtown areas, the historic city centres in European cities remain at the top of the retail hierarchy. By retail hierarchy he refers to the centrality of shopping streets and centres, which are defined by retail space, sales figures and catchment areas, but also by the range of goods. According to his study, middle term consumption goods such as clothing sector hold the leading position in hierarchy, and the higher the rank of a shopping district, the greater is the dominance of the clothing sector. Hatz (2006) also suggests that goods of short-term consumption indicate the opposite compared to middle term consumption goods. He emphasises that the lower ranking a shopping street or district, the higher the proportion of shops offering products of short-term consumption. On the other hand, in their research of grocery-shopping behaviour, Wang and Lo (2007) emphasised that consumption is less about economic rationality and more about cultural values and meanings, whereas location preferences are based on image and identity rather than narrow economically driven criteria. Supporting Wang and Lo, we assume that shopping is a consumer activity that involves preference, selection and leisure that allows social interaction as well. Kemperman et al. (2009) discuss that the pedestrians walk from node to node in a way that they walk forward until the next decision point which is usually on the street intersections. They assume that the path pedestrians take, depends on the relative attractiveness, such as shopping supply and other features that may affect the attractiveness as the history of the path walked so far.

Buildings on small sized plots located in a bounded environment usually encourage pedestrian flow. As Crompton and Brown (2006) indicate that small scaled places without cars may seem much larger to the walking person, than expected. Especially in complicated car-free cities with traditional architectural pattern such as Venice or Fez, tourists believe that the places felt larger than they seem on the map. With the help of entrance doors, these small sized buildings present more options of interest on a unit street scale that can be shifted to economic benefit. Kemperman et. al's (2009) research also supports this hypothesis. They found out that tourists prefer streets/links that are part of a long straight line offering a long view, with buildings on both sides as variations of façades. Therefore, considering the pedestrian movement, historical city centres are still cores of traditional shopping and assets which improves the social attraction of the city (Ülken & Edgü, 2005).

The historical structure is an asset that improves attraction. This paper focuses on the comparison of pedestrian movement and shopping behaviour of the occupants as well as the functional differences of land use in the context of predetermined nodes of attraction located on both sides of the buffer zone in the historical Walled City of Nicosia. As it will be discussed in the following section in a more detailed manner, Walled City of Nicosia has a unique star shaped architectural layout which is unfortunately divided by UN buffer zone into two unequal halves. Therefore considering the distinction of having two different communities settled on each side, the pedestrian movement in terms of shopping also has its unique flow as well. As the research assumes that physical accessibility reinforces social and economic attraction, the paper aims to search,

- the syntactic hints examined through line analysis underlying the physical development of the urban layout in three different periods

of the Walled City, thus exploring the changes of accessibility through integration
- spatial preferences of the pedestrians, emphasizing functional and spatial pattern that orient the consumer behaviour.

2. Case study area

As an island that has been colonised by various nations throughout the history, Cyprus has encountered both the prosperity and downfall of her physical location in the midst of historic crossroads of trade and culture of the Eastern Mediterranean region. However, the conflict between the two major communities of the island, which started during the 1950's has been dominating the political structure of the region ever since. The unresolved political situation followed by the complete division of the island and separation of Greeks and Turks after 1974, unfortunately did not help the solution of the problem. Turkish region declared a self-determinant government of Turkish Republic of Northern Cyprus (TRNC), in 1983; while Greek region was granted full membership of the EU in 2004 as Cyprus Republic (CR).

Division of the island was a critical decision in terms of geography, natural resources and social structure, where the two communities remained unattached until 2003. The citizens of the Turkish region have been fatigued from the isolations and serious financial difficulties due to economic embargo, so as a manoeuvre, TRNC government opened two border gates for mutual passes. However, division of the capital city Nicosia produced even more severe outcomes. One of the harms of the buffer zone called as Green Line, occupied by the UN forces is undermining the city's centrality.The 450 years old star shaped city walls with eleven bastions were also divided ruining the integrity of urban structure and architecture as well (Figure 1). The divided city of more than thirty years has gone through different physical and social development patterns around the divided Venetian walls, providing different functions. For example, business area has moved out of the city where the land is cheaper. As the immediate exterior of the city walls in Turkish side are occupied by administrative and educative purposes, the Greek side is occupied by business and commercial purposes. The inner core, on the other hand remained as a retail district with small shops of clothing, food and restaurants, home supplies, and some manufacturing. The differences in the socioeconomic status of both sides affected the development and urban improvement as well. While due to lack of financial resources, Turkish side preserved the majority of historic urban layout, Greek side, renovated and transformed the historical city to some extent, such as changes in plot sizes, and vertical dimensions. On the other hand, as traffic congestion and lack of sidewalks prevented the pedestrians' easy flow, lack of parking areas made it hard for vehicular access to the shopping zones, in both parts as well.

Five years later, after the opening of initial border gates in 2008, Lokmacı Gate at the end of the Ledra Street was opened for pedestrian access therefore, though, through a weak axis, the connections beyond the Green Line was established once more. This gate working as the check point is the only civilian connection within the Walled City, and is the crucial point in pedestrian movement.

As for the shopping locations within the Walled City, the division left the traditional shopping bazaar Bandabulya, few inns and arasta in Turkish side, while the expensive shopping strip remained in Greek side, excluding the plots lost to the control of UN forces. Hatz (2006) suggests that the

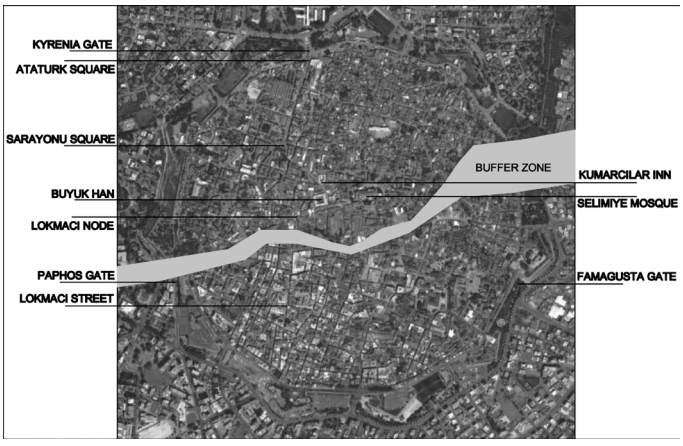

Figure 1. *Nicosia Walled City (map from Google Earth).*

structure of retailing in city centres is not to be examined in terms of a shopping destination serving only local residents and customers. The city centre with its unique atmosphere becomes part of consumption as well. He also adds that, retailing in the city centre is determined by the transformation of the city into a leisure destination, in which the consumption of cultural goods and experiences become prominent. He states that transformations of downtown areas into themed shopping spaces, equipped with artists' quarters, art galleries, bars and restaurants are among the aspects that help a historic city centre to maintain a consumable atmosphere. Similarly, as the shopping facilities outside of the city walls in both sides follow the market demands and trends, the atmosphere helps to preserve the social attraction within the city walls. Even though lately, promising restoration and renovation projects of significant buildings are being undertaken, emergence of workshops and depots among the residential buildings, dilapidation, and obsolescence are still crucial aspects of the urban quality in the Turkish region.

3. Methodology and syntactic analyses

According to Hillier et al, (1993), even though, shops may serve as attractors for the pedestrian movement, syntactically they do not change the configuration of the urban layout. However, in order to figure out the pedestrian preferences due to shopping, we first have to present the syntactic hints examined through line analysis underlying the physical development of the urban layout in three different periods of the Walled City. As it was mentioned before, integration denotes the socio-petal, thus vital nodes and highly connected axes; therefore, exploring the changes of accessibility through the city within time shows us the shift of spatial vitality. These data acquired will then be compared with actual preferences of the pedestrians.

Figure 2. *Line analysis of Nicosia Walled City before 1974.*

The University of Michigan software, Syntax 2D is used in for the syntactic calculations. Syntactic properties of the case study area are analysed initially with the line analysis of the Nicosia Walled City in three phases (Figures 2, 3 and 4) before the division, during the non-contact years and after the opening of gates. These line analyses show the transformation of the city layout within a span of forty years, and also the accessibility routes that are formed through political requirements and precautions taken towards these within the recent history of a city. The syntactic properties of the nodes on the other hand, are examined through grid analyses, where each grid unit is set to be 6 x 6 metres due to the maximum public distance of interaction. Integration n levels, circularity and isovist properties are among the calculated measurements. The obtained numeric data is compared and analysed through regression analyses and Spearman correlations using SPSS.

As it can be seen from the diachronic line analysis maps of Nicosia Walled City from prior to 1974, from 1974 to 2008 and after 2008, (Figures 2, 3 and 4) the mean integration n values change drastically due to the formation of buffer zone that interrupts the pedestrian or vehicular movement. It is clearly exposed in the maps that prior to 1974 the city maintains its centrality by denoting the most integrated axes located close to the centre with a mean integration n figure of $1{,}2320 \times 10^{9}$. In this map Ledra Street the shopping strip, seems to have a high integration level as one

of the parallel streets reaching to central horizontal axis that is connecting the main roads from Paphos gate to Famagusta gate. The axis from the north Kyrenia gate on the other hand seems to have a secondary degree integration while, the central axes present a deeper structure.

After the division and the settling of the UN buffer zone, the mean integration n figure drops drastically to 6,478x108. During the long thirty four years of no connection between the two regions of the city, it is seen that there were two different centres formed within the walls (Figure 4). However if we compare the situation with the previous map, we see that while the most integrated axis of north gains strength, the most integrated axis of south weakens. In both regions, this interruption was compensated by moving the vital public or commercial functions to out of the Walled City, thus abandoning the historical city centre.

Finally after the reconnection of two regions with a single pedestrian passage of Ledra Street/Lokmacı Gate in 2008, we see a considerable improvement of integration n level with a figure of $8{,}2102x10^{8}$. As this situation weakens the most integrated axis in north region, it strengthens southern axis, while reintegrating the central streets to a mild shallowness (Figure 5). We also see minor changes around the northern axis, in terms of newly built roads or opened passages that leads to mild levels of integration in northeast regions compared to the era prior to division.

Crompton (2006) suggests that complexity disturbs our judgment of walking distances, Crompton and Brown (2006) discovered that the more turns, slopes, intersections, and features a walk has, the longer it appears and thus a journey will seem longer when there is more information to be observed. The Nicosia Walled City has a unique organic layout which presents exciting vistas for exploring tourists; on the other hand, it serves as a maze which prevents shortcuts. As mentioned before, comparison of consumer shopping behaviour of the occupants and the differences of land use in both sides of Walled City of Nicosia are among the main concerns of the paper. We should also keep in mind that, traditional shopping district remained in Turkish side, while the expensive and trendy shopping strip called Ledra Street remained in Greek side. In order to understand the behaviour of the occupants and the attraction activity route, observations are executed on the two determined main shopping regions, from both sides of the city.

Figure 3. *Line analysis of Nicosia Walled City between 1974 and 2008.*

Figure 4. *Line analysis of Nicosia Walled City after 2008.*

Since within the Walled City, there is currently only one connection between the divided regions, the chosen axes had to start with Ledra Street, pass the mentioned check point Lokmacı Gate, and continue to north (Turkish) side. As of coincidence, Ledra Street historically used to be the most famous shopping street in the Walled City, as well. Therefore, we initially considered examining a total of three nodes from each side; one node from each starting point that is close to check point, a middle point of some specific characteristics such as a square or an attractive function and finally an ending point before exiting the walls. The nodes were set to be virtual circles with a diameter of 30 metres, regarding the size of the largest gathering area. However, the route to out of the city walls in Turkish side disperses due to the organic layout of smaller sized plots and the pedestrian axis takes a branch like shape generating from the Lokmacı Gate, i.e. the first gathering location from the border. Regarding this situation, and also to see the situation in the original shopping centre of the city, three nodes from the Ledra Street on Greek side, and six nodes from the Turkish side were selected for analyses and comparison (Figure 5).

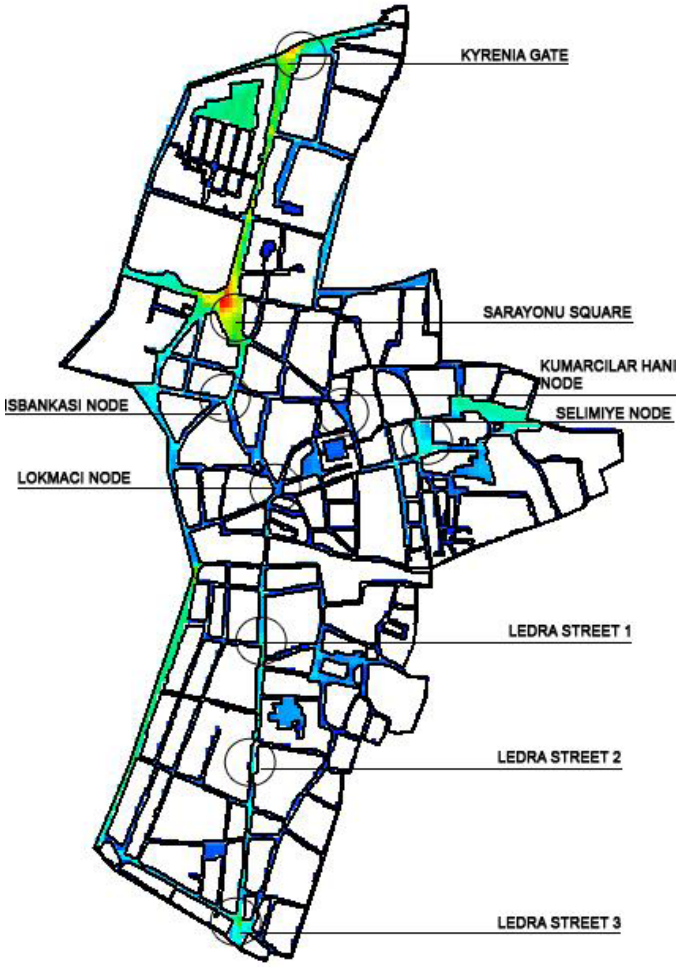

Figure 5. *Predetermined nodes of analysis.*

As it is seen in Figure 5 immediate surroundings of the selected nodes and the main axes are set to be the area of observation. The selected portion of the walled city reaches from southwest to north extending to actual central Selimiye Mosque Square in east. Within this context, Kyrenia Gate, Sarayönü (Atatürk) Square, İşbankası Node and Lokmacı Node have been chosen from northern part of the Walled City. On the other hand, original, i.e. prior to 1974, central gathering and shopping spaces of Kumarcılar Inn and Selimiye Mosque Node are also included in the analyses. Although these are surrounded by shops, nowadays, these latter nodes are frequently used as transitional spaces in order to reach main shopping axes.

Analyses of nodes are executed due to pedestrian flow, functional use and syntactic properties. The pedestrian flow is analysed through observations of 15 minute video recordings. As the pedestrian flow is an important indicator of attraction, number of passers-by present implications of path selection, which in turn points out the potential shopping behaviour. Additionally shopping behaviour was also measured according to number of pedestrians with shopping bags. Thus, during the process, video recordings are counted in each node regarding the total number of pedestrians with or without shopping bags. Considering the customary preference for most of the small retail shops to be closed on Sundays and the extremely hot weather during summer months, video shooting has been done during the period between 12:00 and 14:00 on two Fridays and Saturdays in April and May. These dates are set regarding the most preferred days for shopping, the most crowded period due to lunch time, and also most pleasant weather condition for outdoor space use.

Referring to Hatz's (2006) hierarchy of middle term and short term con-

sumption goods, the attractive functional uses taken into consideration are set to be the retail shops such as clothes, shoes or mobile phone like electronics and the eating-drinking spaces such as cafes, restaurants and bars. The ground floor functional uses of the buildings within the determined nodes are counted and categorized. Although counted in the total number, vacant units and public functions are disregarded in the comparison. As the actual dimensions of the shop units are excluded from the research, the number of units, thus the variations gained importance in the analyses.

Visual boundaries formed by wall like dense building plots may affect to pedestrian perception and preference of shopping. Psychological aspect of this situation is discussed in Yönet and Yirmibeşoğlu's (2009) gated community research, where they resemble gated communities to medieval fortress settlements, in which living behind the gates increases the fear of the unknown that is outside. Even though as we move closer to the walls of the Walled City, our visual scope widens, this theory is supported especially in the central sections of the city, where pausing and relaxing is shifted to continuous circulation. As for the syntactic aspects of the mentioned visual boundary, Ülken and Edgü (2005) point out that, long, narrow streets possess convexity and their one-dimensional axial shape promotes movement and circulation flow, as we see this in the case of Ledra Street. On the other hand, fatter convex spaces are traditionally places that support events and occasions, such as the squares and selected nodes. Circularity analysis is an important spatial characteristic that helps to examine the compactness of the spaces or motivations that drive people to pass through certain streets. Circularity defined as the ratio of the square of the perimeter to area is one of the six geometric measures such as area, perimeter, occlusivity, variance and skewness to obtain isovist field (Benedikt, 1979; Batty, 2001). Circularity is both a measure of the shape of a space and the measure of centrality of the viewpoint within that space. In her museum analysis, Kaynar (2005) argues that deformed circularity that means lower levels of circularity motivates longer visit durations. She also adds that the movement is more distributed in areas that provide opportunities to discover new visual information. Supporting this situation, articulation in an urban setting provides attractive routes and spaces for pedestrian movement which is inevitable for historical city centre shopping. As the structural pattern gets articulated in an organic system, the envi-

Table 1. *Mean syntactic values, pedestrian flow and functional values of the selected nodes.*

		turkish side nodes						greek side nodes		
		kyrenia gate	sarayönü square	kumarcılar han	lokmacı node	işbankası node	selimiye node	ledra street 1	ledra street 2	ledra street 3
syntactic values	circularity	2,1097E+08	1,6377E+08	1,3199E+08	1,7545E+08	1,7999E+08	1,4212E+08	5,5984E+08	3,8361E+08	2,3072E+08
	connectivity	130,958	168,760	21,684	21,455	40,923	61,375	79,600	62,600	63,583
	integration-n	1,5735E+11	1,9852E+11	6,1682E+10	9,5447E+10	1,3522E+11	8,1874E+10	1,9022E+11	1,4416E+11	1,0246E+11
	isovist area	6,0506E+11	7,6559E+11	9,9215E+10	1,4418E+11	2,4869E+11	2,7014E+11	3,1637E+11	2,3009E+11	4,2071E+11
	isovist perimeter	1,2636E+09	1,2703E+09	4,0944E+08	5,8288E+08	7,1472E+08	8,9478E+08	1,3859E+09	9,3937E+08	1,3769E+09
	isovist circularity	236,8731	210,7889	168,9653	235,6342	205,4034	296,3823	607,0830	383,5116	450,5989
environmental values	pedestrians with bag	16	22	18	44	20	31	86	91	61
	pedestrians without bag	118	109	71	265	71	201	323	598	252
	total pedestrians	134	131	89	309	91	232	409	689	313
	# of shops	5	4	8	8	9	5	6	10	7
	# of restaurants & cafes	1	5	2	1	1	1	1	2	1
	other	0	3	1	0	3	1	1	0	0
	total units	6	12	11	9	13	7	8	12	8

ronment tends to present surprising spaces that are appreciated especially by exploring tourists.

The syntactic aspects of the research base on the comparison of spatial parameters such as integration levels, circularity and visual fields, which help us to further examine the physical structure of the predetermined nodes. The map used for these analyses is derived from the 2008 map with single connection between two regions. Therefore it is necessary to remember that after the reconnection of two regions with a single pedestrian passage, the most integrated axis in north region has weakened, while the southern one strengthened, with mild improvement on the central streets. The functional uses of streets, positions of gathering spaces, figures of pedestrian flow are also examined in the research. Table 1 indicates the syntactic values along with the environmental cues of the selected nodes from both regions. Integration n values for the Kyrenia Gate, Sarayönü and Ledra Street also comply with the line analysis results indicated in Figure 5, with the highest overall integration levels.

Connectivity values are the highest for Sarayönü and Kyrenia Gate again parallel to the data presented in Figure 2, however, Ledra Street is lower in connectivity due to the linear nature of the path and the visual boundary of the dense buildings. While connectivity values indicate an easy accessibility through neighbouring grids, it also works reciprocally, as easily exiting to neighbouring grids. Therefore when we compare the connectivity values of these two nodes, with Ledra Street nodes in terms of the number of total pedestrian count, lower connectivity values explain the high percentage of pedestrian flow in Greek side. On the other hand, the number of total pedestrians also seems to be related with the number of shops in both sides excluding restaurants and cafes. This result also complies with Kemperman et. al's (2009) findings that the tourists' shopping route choice behaviour is affected by the supply and accessibility of shops, however tourists do not prefer links with restaurants, lunchrooms, bars and such as these necessitate pausing and lingering for a longer period compared to retail shops.

The most crowded pedestrian movement with or without shopping bags in Turkish side is observed in Lokmacı node, followed by Selimiye node. As Lokmacı Gate being the starting node from the check point, with relatively large number of shop units this crowdedness can be explained. In case of Selimiye however, the pedestrian flow is owed to the centrality of the location within the city along with existence of traditional covered bazaar Bandabulya. In both cases however, we see a striking fact that shopping with bags concentrates mostly on the central core of the Walled City. In both cases frequency of shopping bags decreases as we move towards the north and south exits. Comparing the percentage of shopping bags respecting the total frequency of the pedestrians, Ledra 1 node with 21.02% followed closely by Ledra 3 with 19.48% are the highest shopping nodes of Greek side. Similar numbers are also seen in Turkish side as well; Işbankası node with 21.97% has the highest value while the second largest number is seen at Kumarcılar node with 20.22%.

Table 2. *Regression analyses from the selected nodes.*

	integration n	circularity	connectivity
shop bags	R=0.242 (p= 0,530>0,05)	R= 0.845 (p= 0,004<0,05)	R=0.160 (p= 0,681>0,05)
total pedestrian	R=0.159 (p= 0,684>0,05)	R=0.687 (p= 0,041<0,05)	R=0.152 (p= 0,696>0,05)
shops	R= 0.355 (p= 0,349>0,05)	R=0.133 (p= 0,734>0,05)	R= 0.736 (p= 0,024<0,05)
cafes	R= 0.439 (p= 0,237>0,05)	R= 0,189 (p= 0,626>0,05)	R= 0.627 (p= 0,071>0,05)
total unit	R=0.121 (p= 0,757>0,05)	R=0.103 (p= 0,791>0,05)	R=0.121 (p= 0,756>0,05)
	isovist area	isovist circularity	isovist perimeter
shop bags	R=0.237 (p= 0,539>0,05)	R= 0.854 (p= 0,003<0,05)	R=0.350 (p= 0,356>0,05)
total pedestrian	R=0.254 (p= 0,510>0,05)	R=0.643 (p= 0,061>0,05)	R=0.206 (p= 0,595>0,05)
shops	R= 0.732 (p= 0.025<0,05)	R=0.013 (p= 0,974>0,05)	R= 0.560 (p= 0,117>0,05)
cafes	R= 0.575 (p= 0,106>0,05)	R= 0,308 (p= 0,421>0,05)	R= 0.140 (p= 0,719>0,05)
total unit	R=0.145 (p= 0,709>0,05)	R=0.337 (p= 0,375>0,05)	R=0.406 (p= 0,279>0,05)

Ledra Street on the other hand, presents striking number of pedestrians compared to Turkish side. Although the number of shop units is similar in number of attraction points, the pedestrian flow is observed to be much greater. This situation complies with Kemperman et. al's (2009) findings assuming that tourists prefer to circulate on streets/links that are part of a long straight line offering a long view, with buildings on both sides as variations of façades. Ledra 1 and Ledra 3 nodes have the highest values of isovist perimeters enabling a longer vision for pedestrians to perceive the direction of movement from a longer distance and move towards the crowd, i.e. attraction.

In the regression analyses shown in Table 2, pedestrian flow and shop unit data were considered as dependent variables, while the syntactic values are considered as independent. Regression analysis is investigated with the R values with significance between -1 and +1. Strong correlations are shown in dark shaded cells while although not statistically significant, mild implications, which are worth noting are also shown in lighter shaded cells.

The regression analyses indicated in Table 2 show the correlations of the syntactic and environmental figures of the selected nodes given in Table 1. Circularity of the nodes and circularity of the isovists from the centre of the nodes are significantly correlated with shopping behaviour, and pedestrian flow as a whole. This situation leads us to refer to Kaynar, (2005) once again, as she argues that lower levels of circularity motivates longer visit durations, which explains the shopping behaviour occurring on dispersed nodes of Kumarcılar and Selimiye. On the other hand, theory is supported by the higher levels of circularity promoting movement as in our cases of pedestrian flow in Ledra Street, while a distraction and dispersion is seen in branch like street axes in Turkish side.

As for the location and attraction levels of commercial units, we see that while cafes and restaurants are placed randomly with a smaller number of units, they do not present significant outcomes. However as for retail shops, we see a strong correlation both with isovist area and connectivity aspects. If the pedestrians are looking for certain types of items the size of the isovist area presents better scope of exploration. Therefore we see that the number of shop units increases in a more widely perceived layout. Connectivity correlations of the shops also support this finding as higher the level of connectivity higher the level of integration thus accessibility from the perspective of pedestrians, in their search for specific brand or good types.

4. Conclusion and discussion

In Ledra Street of the Greek region, the shopping preferences of the pedestrians are observed to concentrate on retail rather than recreational spaces, thus indicating a conscious selection of brands to shop from in a linear street layout. In the case of Turkish region however, central nodes present highest number of pedestrian flow, significantly dropping at the end points of the axes, again in accordance with the number of shop units. However, in these regions, pedestrian flow is also parallel with the existence of squares with recreational attraction points, such as the cafes and restaurants. This result implies a preference of eating spaces over retail shopping spaces in the organic street layout.

The research indicated that narrow long roads promote pedestrian flow in a movement based activity, while the curvy organic formed narrow streets disperse the pedestrian movement. As for the percentages of shopping bags, both sides of the buffer zone present similarities denoting an approximate rate of 20% of shopping for pedestrian count. As the retail shop units increase, the percentage of shopping as expected, also increases. If these units are located in corners of narrow street nodes, the shopping percentage also increases. However if the shop units are located on square like spaces with number of cafes and restaurants, then the shopping tendency decreases, which can be explained by losing attention or distraction of perception.

The results of the research emphasise that the division of the Walled City has an immense impact on the perception of the pedestrians, which

leads to the dispersion of the attraction points. It is observed that the psychological effects of the war and division on the occupants from both regions are still valid, thus this situation leads to a drawback from the buffer zone, towards more secure areas within the city. Referring back to Yönet and Yirmibeşoğlu (2009), outside the walls of the city seems to be more secure for both communities and after long years of fearing whatever is on the other side of the buffer zone has yet to be dealt with. However, we also observed that the existence of the buffer zone also serves as a type of political attractor, displaying a large amount of mobility at both sides of the check point. Kemperman et al.'s (2009) assumption of the tourist movement route ending at the starting point is also apparent in this research stressing that since the only option of turning back to the entrance is through Ledra Gate, pedestrian activity increases around the nodes closest to the check point and these nodes serve as meeting points rather than shopping preference.

Pedestrian flow supports syntactic outcomes especially with isovist and circularity values. Variations of shopping spaces promotes pedestrian flow, small sized units especially serve the level of attraction in historical environments. However, actual physical interruption of any layout definitely presents a non healing setting that certainly affects the spatial preferences of the users, as seen in the case of the UN Buffer zone.

References

Batty, M. (2001). Exploring Isovist Fields: Space and Shape in Architectural and Urban Morphology. *Environment and Planning B: Planning and Design*. 28 (1), 123-150.

Benedikt, M. (1979). To Take the Hold of Space: Isovists and Isovist Fields. *Environment and Planning B: Planning and Design*, 6(1), 47-65.

Crompton, A. (2006). Perceived Distance in the City as a Function of Time, *Environment and Behavior*, 38(2), 173-182.

Crompton, A. and Brown, F. (2006). Distance Estimation in a Small-Scale Environment, *Environment and Behavior*, 38 (5), 656-666.

Edgü, E. (2003). *A Syntactic Approach to Space*. 1st International Symposium of Interactive Media Design, Yeditepe University, İstanbul.

Hatz, G. (2006). Competition and Complementarity of Retailing in the Historic City Center of Vienna. *Competition and Complementarity in Retailing,* 1, 135-154.

Hillier, B. (1999). Centrality as a Process: Accounting For Attraction Inequalities in Deformed Grids. *Urban Design International,* 4, 107-127.

Hillier, B., Burdett, R., Peponis, J., Penn, A. (1987), Creating Life: or, Does Architecture Determine Anything. *Architecture and Behaviour*, 3(3), 233-250.

Hillier, B., Leaman, A. (1974), how is Design Possible?. *Journal of Architectural Research and Teaching*, 3, 4-11.

Hillier, B., Penn, A., Hanson, J., Grajewski, T. and Xu, J. (1993). Natural Movement: or Configuration and Attraction in Urban Pedestrian Movement. *Environment & Planning B: Planning & Design*, 20, 29-66.

Kaynar, İ. (2005). *Visibility Movement Paths and Preferences in Open Plan Museums: An Observational and Descriptive Study of the Ann Arbor Hands-on Museum*. 5th International Space Syntax Symposium, Delft, the Netherlands.

Kemperman, A.D.A.M., Borgers, A.W.J., Timmermans, H.J.P. (2009). Tourist Shopping Behavior in a Historic Downtown Area. T*ourism Management,* 30(2), 208-218.

Lewicka, M. (2008). Place Attachment, Place Identity, and Place Memory: Restoring the Forgotten City Past. *Journal of Environmental Psychology*, 28, 209–23.

Peponis, J. (2000). A Syntactic Approach to Space. Rertived from http://undertow.arch.gatech.edu/homepages/3sss/ introduction text for the 3rd International Symposium on Space Syntax/ Georgia Tech Atlanta

Portnov, B.A. (1998). Social Attractiveness of the Urban Physical Environment: Cities of Siberia. *Annals of Regional Science,* 32 (4), 525-548.

Ülken, G. and Edgü, E. (2005). Social Dynamics of Urban Transformation. *5th International Space Syntax*

Symposium Proceedings, 2, 669-679.

Ünlü, A., Edgü, E., Cimşit, F., Şalgamcıoğlu, M E., Garip, E., and Mansouri, A., (2009). Interface of Indoor and Outdoor Spaces in Buildings: A Syntactic Comparison of Architectural Schools in Istanbul, *7th International Space Syntax Symposium Proceedings,* 132.

Wang, L. and Lo, L. (2007). Immigrant Grocery-Shopping Behavior: Ethnic Identity versus Accessibility. *Environment and Planning A,* 39 (3), 684-699.

Weltevreden, J.W.J., Atzema, O. and Frenken, K. (2005). Evolution in city centre retailing: the Case of Utrecht. *International Journal of Retail and Distribution Management*, 33 (11), 824-841.

Weltevreden, J.W.J., Rietbergen, T.V., E-shopping versus City Centre Shopping: the Role of Perceived City Centre Attractiveness. *Tijdschrift voor Economische en Sociale Geografie,* 98, 68–85.

Yönet, N.A. and Yirmibeşoğlu, F. (2009). Gated Communities in Istanbul: Security and Fear of Crime. *ENHR 2009, Prague, Changing Housing Markets; Integration and Segmantat,* Prague.

Bölünmüş alışveriş: Tüketici davranışlarına dizimsel bir yaklaşım

Tarihî kent merkezleri, zaman içinde kullanıcı memnuniyeti açısından sakinlerinin ihtiyaç ve beklentilerini karşılamaktan uzaklaşabilir. Lewicka (2008), tarihî merkezlerin, sürekliliği sağlama ve yere bağlılığı kolaylaştırmanın yanı sıra, var olan gelenekleri somutlaştırdığını belirtir. Bu nedenle, yaşanan beklenmedik nüfus dalgalanmaları veya savaş ve yönetim değişikliği gibi, ortaya çıkabilecek bazı temel etmenlere rağmen, tarihî kentler hâlâ çekim merkezi olmaya devam etmekte ve özellikle perakende arzı açısından ekonomik ve kültürel canlılıklarını sürdürmektedirler. Weltevreden ve Rietbergen'in (2007) belirttiği gibi tarihî kent merkezlerine olan ilgiyi arttırmada, alışveriş önemli rol oynar; kent merkezleri aynı zamanda insanların buluştukları, sosyalleştikleri ve eğlendikleri mekânlardır. Kent merkezlerinin birer cazibe merkezine dönüşmesinde dört ana faktör önemlidir; bunlar, karakteristik bir çevreye sahip olmak, alışveriş dışında, müze, tiyatro, restoran gibi farklı işlevler sunabilmek, dükkânların sayısı ve çeşitliliği ile kalabalıklık olarak sıralanmaktadır. Kalabalıklık ile sosyal etkileşimin artması, yaya akışının sağlanabilmesine bağlıdır.

Kent merkezlerindeki eylemleri sosyal cazibe üzerinden değerlendiren çeşitli çalışmalar bulunmaktadır; bunlar arasında, Kemperman ve diğerlerinin (2009) çalışmasında tarihî kent merkezlerinin turistik alışverişler için çekim merkezi olduğu vurgulanmaktadır. Bu çalışmaya göre, turistler fiziksel açıdan çekici, geniş görüş alanına sahip, yaya dostu sokakları tercih ederler; yaya hareketi ve çevreye aşinalık alışverişe özendirir.

Hillier ve Leaman'a (1974) göre mekânsal dizim belirli sosyal ve kültürel varsayımlara göre şekillenen farklı mekânsal düzenler üretmek için kullanılabilecek kurallar dizisidir. Çeşitli ölçeklerdeki iç ve dış mekân biçimlenişleri ve görsel algıları dışbükey şekiller ve aks çizgileri ile yorumlanabilmektedir (Hillier ve diğ., 1987; Peponis, 2000). Bütünleşme değeri dışbükey bir şekil içinde yer alan tüm noktaların, o sistem içinde birbirlerine olan uzaklıkları ile ilgilidir. Buna göre, eğer bir noktanın gerçek bütünleşme değeri yüksek ise, diğer bütün noktalardan o noktaya erişim kolay ve dolaysızdır. Bağlaşıklık değeri hücrelere doğrudan bağlı olan komşu hücrelerin sayısıdır. Bu nedenle eğer hücre sistemin ortalarına yakınsa etrafında sayıca daha fazla hücre bulunur ve bütünleşme değeri artar. Diğer yandan hücrenin sistemin çeperlerine yakın olması bütünleşme değerini azaltır ve ortalama derinlik değerini arttırır. Bu nedenle yol olarak tanımlayabileceğimiz aksların bütünleşme ve bağlaşıklık değerleri arasındaki ilişki herhangi bir mekânın yaya hareketine uygun olup olmadığını da belirler.

Kent dokusu, binaların kompozisyonu ve kent içindeki mesafeler gibi

fiziksel özelliklerin yayalar tarafından algılanması, kentin cazibesini arttıran önemli etkenlerdendir. Tarihî kent merkezlerinde, eğlence mekânları ve butik, restoran gibi ticarî alanlarla desteklenen ve yaya akışını özendiren iyi bir dolaşımın bulunması yerli halk ve turistlerin ilgisini canlı tutar. Yayaların seçmiş oldukları dolaşım yolları, bu yolların göreceli olarak ne kadar cezbedici oldukları ve üzerlerinde yer alan kısa ve orta vadeli tüketim ürünlerini barındıran işlevlerle ve bunlara bağlı alışkanlıklarla da ilgilidir (Hatz, 2006; Wang ve Lo, 2007).

Sınırlı bir çevrede, küçük parseller üzerine yerleşmiş olan binaların oluşturduğu tanımlı sokaklar da yaya akışını özendirmektedir. Crampton ve Brown (2006) küçük ölçekli ve araç trafiğinin olmadığı yerlerin, yaya trafiğinde artış yarattığını, yaya olarak dolaşılan bu alanın turist tarafından olduğundan daha geniş olarak algılandığını belirtirler. Dolaşımın rahat sağlandığı bu yerlerde, bir sokak üzerine dizilmiş olan küçük ölçekli binaların giriş kapıları, oluşturdukları farklı seçeneklerle ekonomik fayda da sağlayabilmektedirler. Kemperman ve diğerlerinin 2009'da yaptığı çalışmada, turistlerin iki tarafı binalarla tanımlanmış ve uzun görüş açısı sağlayan sokakları tercih ettikleri belirlenmiştir. Bu nedenle, yaya hareketleri göz önünde tutulduğunda, tarihî kent merkezleri, birer sosyal çekim noktası olarak halen geleneksel alışverişin odağıdırlar (Ülken ve Edgü, 2005).

Kentin tarihî yapısının cazibeyi arttıran bir unsur olduğunun varsayıldığı bu araştırma, yaya hareketleri ve alışveriş davranışlarına odaklanmaktadır. Bu çalışma, hem Kıbrıs Cumhuriyeti'nin, hem de Kuzey Kıbrıs Türk Cumhuriyeti'nin başkenti olan Lefkoşa'da Suriçi olarak bilinen, tarihî kent merkezinde, tüketici alışveriş davranışlarına karşılaştırmalı bir yaklaşımı benimsemiştir. Birleşmiş Milletler tarafından oluşturulan ve Yeşil Hat olarak bilinen askerî tampon bölge ile eşit olmayan iki yarıya bölünen onbir burçlu yıldız biçimli tarihî kentte merkezîlik kaybolurken, buna bağlı olarak fiziksel ve sosyal gelişim örüntüleri değişmiştir. Örneğin, tarihî şehir içindeki iş alanları, arazi fiyatlarının daha ucuz olduğu şehir dışına kaymıştır. Bu bağlamda, Türk tarafında sur duvarlarının hemen dışında yönetim ve eğitim amaçlı yapılaşma, Rum tarafında ise daha çok iş ve ticarî amaçlı bir yapılaşma gözlenmektedir. Buna karşılık, sur duvarlarının içindeki tarihî bölge, küçük butikler, yemek yeme alanları, imalâthaneler ve hediyelik eşya satan küçük dükkânların olduğu ticarî ağırlıklı bir bölgeye dönüşmüştür. Ekonomik tercihler Rum tarafındaki tarihî örüntünün yüksek katlı binalarla yer değiştirmesine neden olurken Türk tarafında yenilenme sınırlı kalmış ve özgünlük korunabilmiştir. Fiziksel ulaşılabilirliğin sosyal ve ekonomik cazibeyi güçlendirdiğinin varsayıldığı bu araştırma, iki konu üzerinde yoğunlaşmaktadır:

- çizgi analizi yöntemi ile kentin üç farklı dönemdeki fiziksel örüntüsünün gelişimini ortaya koyan dizimsel ipuçlarının belirlenmesi,
- tüketici davranışlarını yönlendiren işlevsel ve mekânsal örüntüleri vurgulayan yaya tercihlerinin ortaya konması.

Alan çalışmasında Lefkoşa tarihî kent merkezinin 1974 öncesi, 1974 ile karşılıklı geçişlerin başladığı 2008'e kadar olan iletişimsiz dönem ve 2008 sonrası açılan tek yaya gümrük kapısı (Ledra Caddesi'ne bağlanan Lokmacı kapısı) ile yeniden kurulan kuzey-güney bağlantısının incelendiği haritalarda öncelikle gerçek bütünleşme değerlerine bakılmış ve kentin özgün merkezî düzeninin geçirdiği evreler yorumlanmıştır. Diğer yandan, alışveriş davranışını belirlemek üzere kentin mevcut durumunda gözlemler yapılmış, toplanma, geçiş ve alışverişe dayalı işlevsel kullanım alanları sosyal uzaklığa bağlı olarak nisan ve mayıs aylarında iki ayrı Cuma ve Cumartesi günlerinde elde edilen onbeşer dakikalık video kayıtları ile belirlenmiştir, yaya akışı ve alışveriş torbaları sayılmıştır. Bölünmeyle birlikte tarihî kentin Bandabulya olarak bilinen geleneksel pazaryeri, bazı hanları ve arastası Türk tarafında kalırken, pahalı dükkânların yer aldığı alışveriş caddesi Rum tarafında kalmıştır. Her iki bölgede de suriçi dışında kalan alanda pazar talepleri ve güncel eğilimler baskınken, suriçinin tarihî atmosferinin cazibeyi

korumaya yardımcı olduğu görülmüştür.

Lefkoşa Suriçi'nin 1974 öncesi, 1974-2008 arası ve 2008 sonrası artzamanlı çizgi haritalarının ortalama bütünleşme değerleri incelenmiştir. Bölünmeden önceki süreçte kentin merkezîliğinin vurgulandığı, bölünmeyle birlikte iki farklı merkez oluştuğu, güney daha ılımlı bir bütünleşme gösterirken, kuzeyde Girne kapısı aksının belirginleştiği, yeniden bağlantı sağlandıktan sonra ise kuzey aksının zayıfladığı ancak devamındaki Ledra aksının güçlendiği görülmektedir.

2008 sonrasındaki alışveriş davranışını belirlemek için Rum tarafından üç adet, dağınık organik yapısı nedeniyle Türk tarafından ise altı adet 30 m çaplı düğüm noktası analiz edilerek karşılaştırılmıştır. Zemin katlarda yer alan yiyecek, giyim, elektronik eşya türündeki perakende dükkânlar bağlamında yaya ve alışveriş hareketi incelenmiştir. Bütünleşme değeri, döngüsellik, bağlaşıklık ve eşgörüş analizi gibi dizimsel bulgular, Rum tarafındaki uzun ve dar sokakların yaya akışını hareket odaklı eylemlere teşvik ederken, Türk tarafındaki kıvrımlı ve organik biçimli dar yolların yaya akışını dağıttığını göstermiştir. Alışveriş torbalarının sayısı merkezde yoğunlaşırken, sur dışına doğru azalmaktadır. Bunun yanında, tüketicilerin çizgisel sokak düzeninde bağlaşıklık ve bütünleşme değerlerinin de desteklediği gibi marka odaklı perakende tüketim eğilimleri oluşurken, dağınık organik bir düzende ise daha çok yeme-içme odaklı aktiviteye yöneldikleri belirlenmiştir. Bununla birlikte, tampon bölgenin politik olarak merak uyandıran iki tarafı da, işlevsel kullanımdan bağımsız olarak, öne çıkan çekim ve buluşma noktaları haline gelmektedir.