Communities and spatial culture in a communally diverse city:
Ahmedabad, India

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Abstract
Modern cities attract people from different walks of life with different cultural backgrounds. Many design professionals are unaware of the relationship between culture and space, as well as the potential of space for fostering the culture of distinct communities. It is imperative that modern cities should enable different cultures to coexist, while still helping each community to keep its cultural identity and so avoid conflicts and tensions arising from it. It is argued that a culturally sensitive design approach could help in attaining a diverse but cohesive society, thus achieving a socially sustainable urban community.

Keywords
Space Syntax, Community, Space structure, Ahmedabad, Walled city

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This paper outlines recent research looking at 'spatial culture' and the culture of cities. Previous studies of cities show distinct morphological and syntactic differences between distinct cultural settings. This study examines the differences in morphology of different areas of the walled city of Ahmedabad, where different ethnic communities live in distinct localities. This analysis was carried out by using space syntax methodology. Different localities within the walled city were studied, both as they are embedded in the city, and in isolation. This was done in order to find the differences in their organisation of spaces and their relation to their immediate neighbourhoods, as well as to find the relation of spaces to other spaces within the walled area.

The investigation showed many similarities in the local areas of Ahmedabad in terms of their syntactic values and the structuring principles of spaces. But a detailed analysis showed some differences in the spatial patterns of Hindu and Muslim communities. These differences, when looked at in conjunction with the ethnic landscape of the city, revealed some interesting aspects of typical social and cultural patterns of the walled city of Ahmedabad.

It appears that while there are differences in culture and in the patterns of use of spaces, the manifestation of these differences is not as contrasting as expected from previous studies, which have compared similar aspects of cities located in diverse parts of the world. A significant finding of this study is that the relation of these distinct areas is a result of these cultural differences. This might be the critical reason for the formal and sometimes tense social situation of Ahmedabad.

1. Introduction

Enough syntactic studies have been done to show that although cities around the world share many spatial characteristics (Hillier, 1996), there are significant differences in the syntactic and geometric structures of their spaces. Some of these differences are likely to be the results of cultural differences between them. For example, cities in the Arab world are on average much less connected and integrated (locally and globally) than European cities (see Table 1). On average they have less intelligibility and synergy. Furthermore, geometrically, they have shorter lines of sight, and a different range of angles of incidence between the lines (Karimi, 1999). So what cultural difference has caused or might be thought to have caused this?

In this context, the specific question asked in this research is, since such differences exist between cities, what do we find when different cultural groups occupy different areas in the same city (for example in Jerusalem): do the cultural differences manifest themselves in space? Or does the culture of the city itself exercise a stronger force and make the areas occupied by different cultural groups more similar to each other than they would be in different cities?

To answer these questions, a case study was done in the walled area of Ahmedabad in India, where Hindu and Muslim communities, along with some other small groups like Jains and Parsi, live in well-defined areas. Three specific questions asked are:

1. Are the areas occupied by different cultural groups in that city spatially different?
2. Are the boundaries between areas occupied by different groups stronger than boundaries within one cultural group?
3. Are the areas of the different groups differently related to the city as a whole?

This study is intended to help us understand the ways by which a spatial community with strong internal bonding organises, uses and defines the spaces within its neighbourhood. This understanding could lead us to include some socio-spatial strategy in the measures we take to redevelop these unique settlements.

2. Study and methodology

This study uses space syntax methodology to analyse the spatial and morphological differences between the two distinct communities mentioned above, namely the Hindu and Muslim communities within the walled city of Ahmedabad. This method was found to be very useful in similar studies, which looked at spatial and morphological differences (Hillier, 1987, Karimi, 1999, Nilufar, 1997). In Ahmedabad, streets and pols have distinct Hindu or Muslim names, which reflect the resident community.

After verifying the accuracy of this by identifying community areas through a survey, each community area was mapped by identifying well-defined blocks formed by large clusters of streets with Hindu or Muslim names. The analysis mainly used an axial map of the walled city to compare and contrast Hindu and Muslim areas. Seven Hindu and seven Muslim areas were then chosen for detailed comparative study. For this comparative analysis, the areas were looked at both in isolation (cut out model) and in the context of the whole city (embedded model) in order to examine how well embedded each area was within the city as a whole. Initially, the key syntactic variables of Ahmedabad were compared to those of cities around the world, to establish the similarities to, and differences from, them. Having done that, in the next step, the syntactic variables (global and local integration value, intelligibility, connectivity etc), morphological characteristics (line length, angle of incidence, pattern of integration etc) of the two communities in Ahmedabad were compared, to establish their similarities and differences as well as their relationship to the city as a whole.

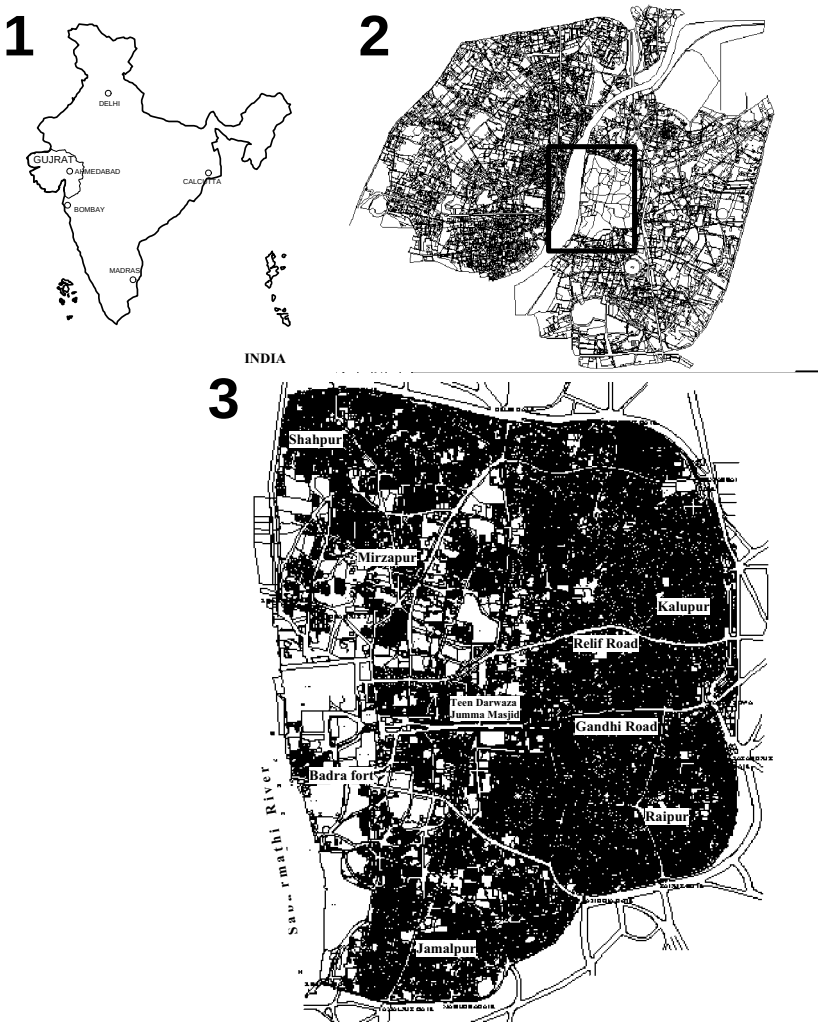

Figure 1: Location of walled city

1: Location of Gujrat
2: Ahmeddabad
3: Walled City and Wards

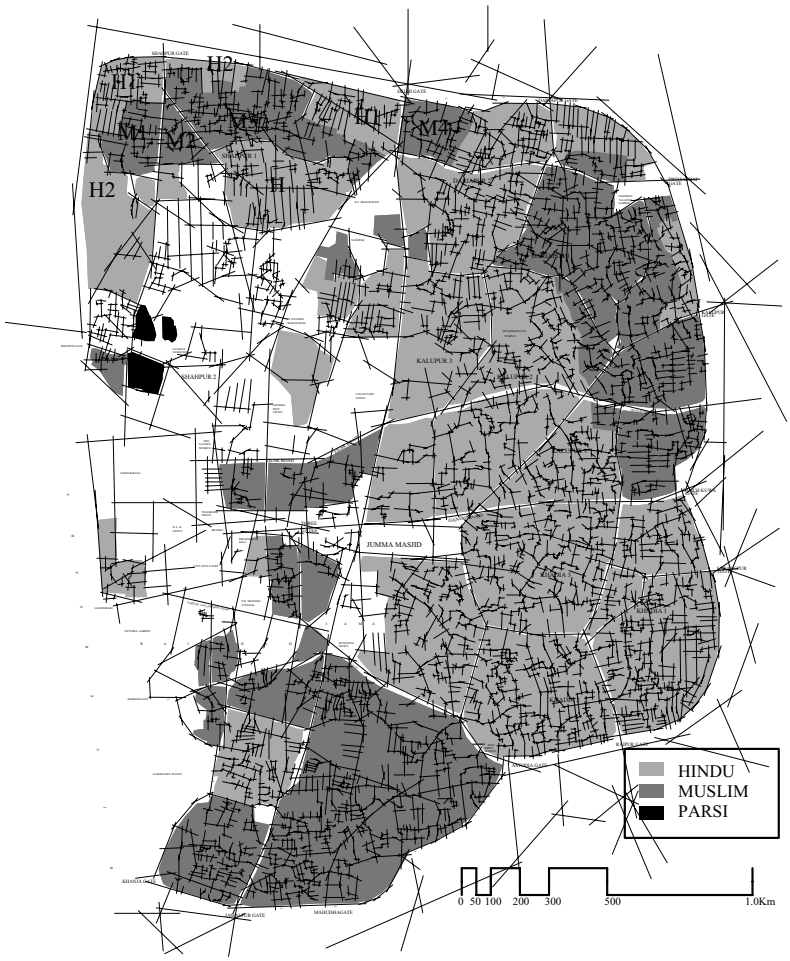

Figure 2: Community landscape
(based on survey done by author)

3. Introduction to case study: Walled City of Ahmedabad, India

Ahmedabad is a city in the west-central state of Gujarat in India (Figure 1). Its origin dates back to the 10th century. A significant event in the development of the city was the construction of the walled city on the eastern banks of the Sabarmati river in 1411 AD by Ahmed-Shah. Since then, many rulers have been in their seat of power. The British finally took control of the city in 1817 (Rajan, 1980). In the later part of the 19thcentury the city became known as the 'Manchester of the east', owing to large developments in the textile industries. This industrialisation increased the population through the migration of labourers to the city to work in the textile mills. As a result of this rapid growth, the western banks of the Sabarmati river began to be urbanised. Today, Ahmedabad's total urban area exceeds the walled area by more than twenty times (AUDA, 1992). The original walled city is full of congested roads, pollution and a fragile social situation, shown in constant riots. These riots to some extent cripple the normal functioning of city, thus holding it back from a further major leap in its economic development.

Ahmedabad has always been a city of two major religious groups, the Hindus and the Muslims. During the Mughal period (16th century), when the second wall defining today's walled city was constructed, the Muslim population (then the ruling

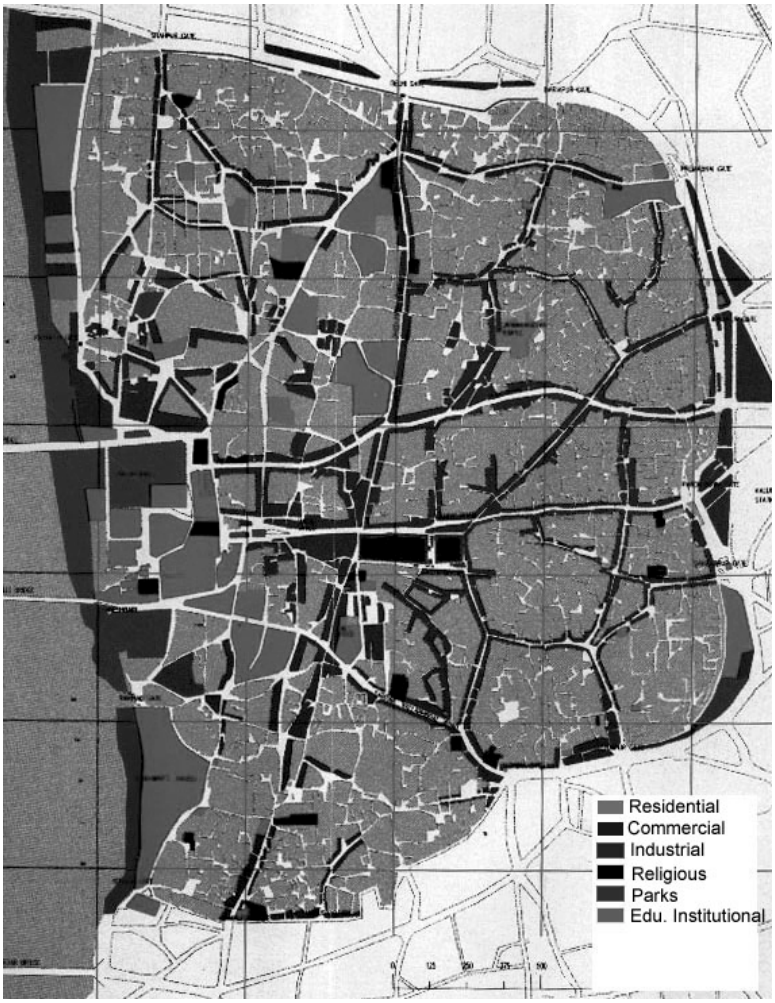

Figure 3: Land use map
(source: AMC & EPC, 1997)

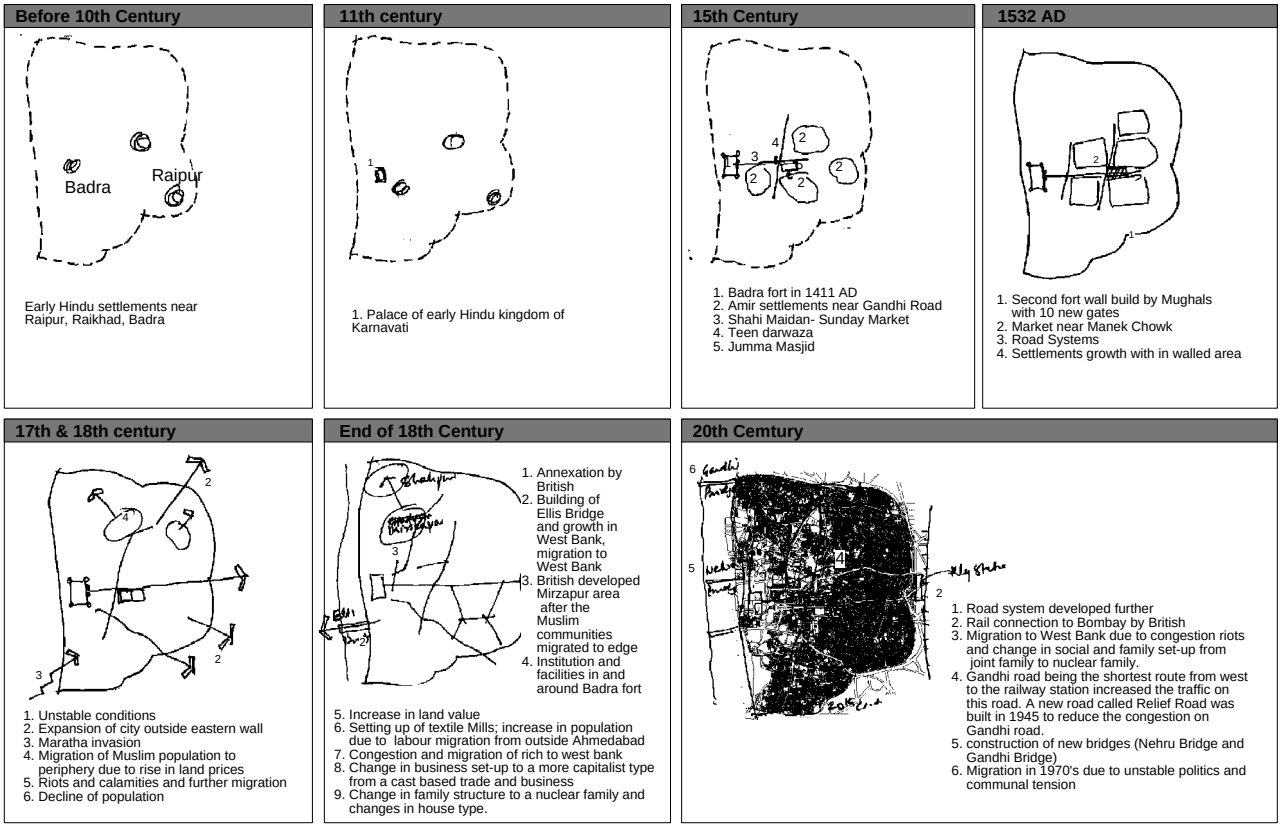

Figure 4: Growth of walled city (based on Balsavar, 1990)

community) of the city occupied the strategic areas around the key darwaza , as can still be seen today (Figure 2). In those times, the rich Vanias and Jains (merchant Some of the recent studies of pols suggest that constant social conflicts and the need to secure a neighbourhood resulted in their particular typology.

Figure 5: Dead-end streets pattern of a typical pol.
(source: Jethabhai ni pol-VSF, 1998)

Figure 6a: Inner residential street
(photograph by author)

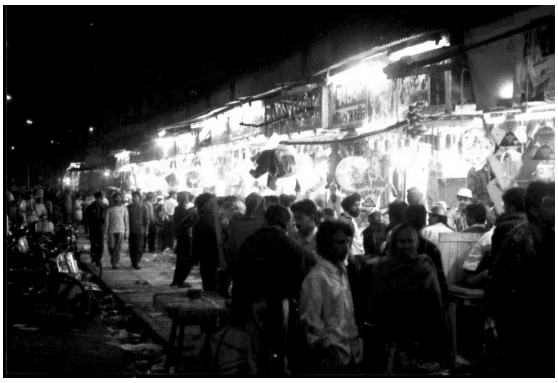

Figure 6b: Night life of Hindu area
(photograph by author)

Figure 5 shows a typical pol, with its gated entry and labyrinthine dead-end street system. Today, these meandering street systems are the place of community activity and play space for children, as well as access routes to the pol houses (Figure 6a).

4. Cultural difference of Hindu and Muslim communities

Both Hindus and Muslims form communities with strong religious feelings, based on their respective religious philosophy, which in many ways dictates their daily life. It is generally considered that, in comparison with the Hindu, the present-day Muslim community is more conservative in its life style. This is explicit in the manner of dress and the social life of women, as well as in the general introverted appearance

of their households, neighbourhoods and the locations of their neighbourhoods away from the main streets. In the case of the walled city of Ahmedabad, both communities use the spaces inside the residential area extensively for social activity and as play space for children, and often one can find small religious buildings like altars, small temples, or mosques within them.

Although this is the general pattern of space structure and the pattern of use, there are some noTable differences in the way people use the spaces in these two prominent communities. In observations made during study, it was noticed that the inner spaces of blocks in Muslim areas are highly active community spaces during the daytime, but by contrast become deserted as early as 9pm. At that same time we found the Hindu areas are very busy, with high commercial activity (Figure 6b). In the Hindu areas, even though the inner areas are active as social spaces, the outer boundary streets are the most active, with commercial and social functions. Even though no detailed observation of pedestrian movement was done for this research, it was noted that generally Muslim areas had far less through movements at the edge as well as through their centre.

While there is much research on the history (Gallion, 1968, Watakhchand 1851) vernacular architecture (VSF, 1998, Rajan, 1980, Kapoor, 1996) and planning (AMC and EPS 1999) of Ahmedabad, there is no significant research into the effects of culture on the spatial layout of these areas, which is main focus of this study.

5. General syntactic properties of the Walled City of Ahmedabad in comparison to cities around the world

Like most cities across the world, the pattern of the walled city of Ahmedabad has a central integration core and axis, with high integration values connecting the centre to the edges (Figure 7). As found in previous research (Hillier, 1999), Ahmedabad has more retail land use on the highly integrated streets, resulting in an intensified local grid around them.

Globally, Ahmedabad has a mean integration value of 0.8011, which, when compared with cities around the world, is more than that of cities in UK, but less than those in Europe (see Table 1). In previous studies it has been found that British cities tend to disintegrate in terms of global integration when they grow bigger (Hillier, 1996). In the global integration map (Rad-n) of the walled city of Ahmedabad, we can see that the main integration core is near Badra Fort, which is slightly off-centre to the west of the geometric centre, but central on a north-south axis. In comparing the connectivity of the walled area (2.9705) to the connectivity of cities around the world, it has been found that it closely matches those of Arabian cities; that is, the

average connection of each line is about 3, while it is about 4 in the UK and 5 in Europe (see Table 1). The lower connectivity figure is attributed to the non-orthogonal grid, which naturally growing cities have, unlike the regular grid of American and some European cities. Karimi (1999) in his study has shown the broken line structure, which explains lower connectivity as a feature of Iranian and Arab cities in general. Thus, in Ahmedabad, as in Arabian cities, the low value of connectivity means increased mean depth, and higher line density.

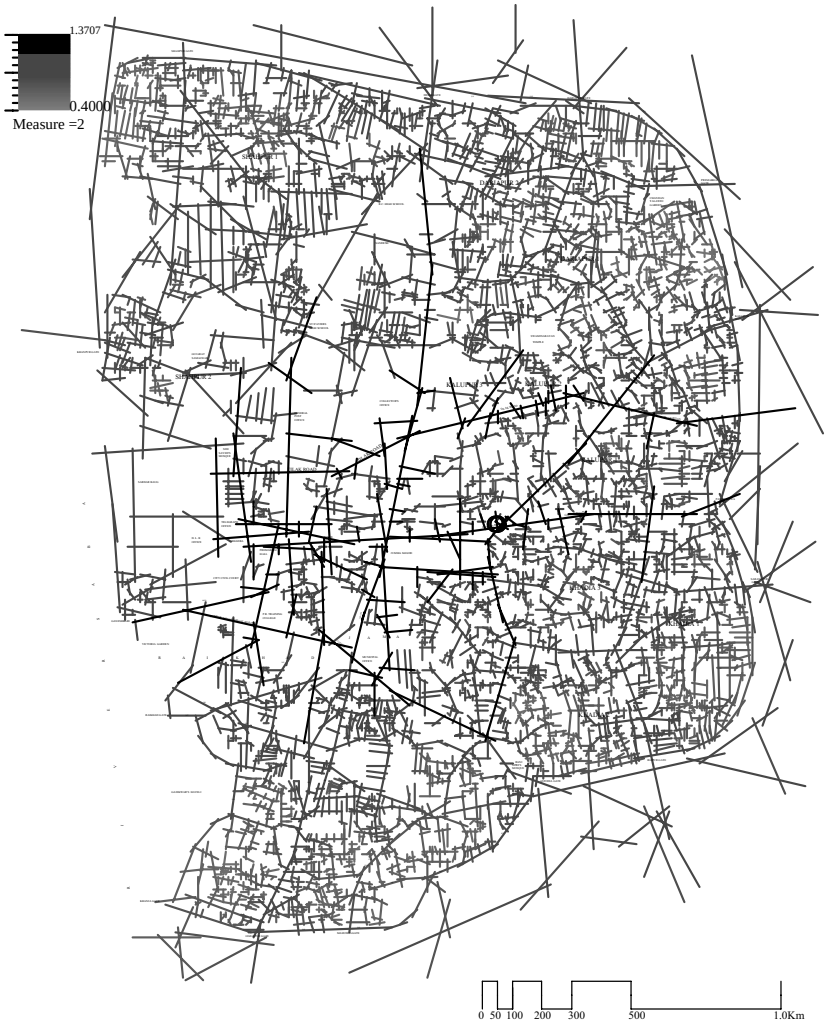

Figure 7: Global Integration Map

	K cases	Axial size K/10	Connectivity	Local (R3)	Global (RN)	Intelligibility Rn/Con	Synergy Rn/R3
USA	12	5420	5.835	2.956	1.610	0.224	0.559
Europe	15	5030	4.609	2.254	0.918	0.137	0.266
U.K	13	4440	3.713	2.148	0.720	0.124	0.232
Arab	18	840	2.975	1.619	0.650	0.231	0.160
Ahmedabad	1	4876	2.970	1.747	0.801	0.115	0.193

Table 1. Comparison of syntactic values of walled city of Ahmedabad to that of rest of the world

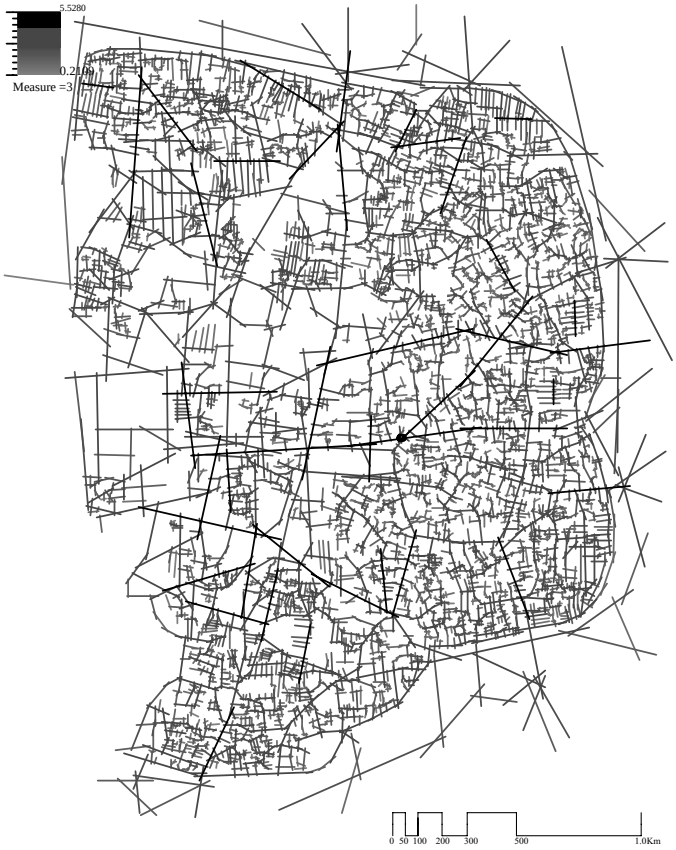

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Figure 8: Local integration map (Radius 3)

Figure 9: Local integration map (Radius 5)

Locally, even though Ahmedabad is more integrated (μRad-3=1.747) than Arab cities, the difference is not significant, whereas it is found to be significantly different from those of European and UK cities (see Table 1). Using the mean depth from the main roads as the radius for local characteristics (instead of Rad-3) was found in previous studies (Karimi, 1999) to be more useful in cases of cities with a broken line structure. The mean depth from the main roads in the case of Ahmedabad is 5, and the mean integration value of Ahmedabad at Radius 5 is 1.3542. Further, a more local integration map at radius 5 (Figure 9) shows the existence of two integration cores: one with strong clustering, as in the global integration map (Figure 7) at the centre, and the other in the north-western side near Shahpur.

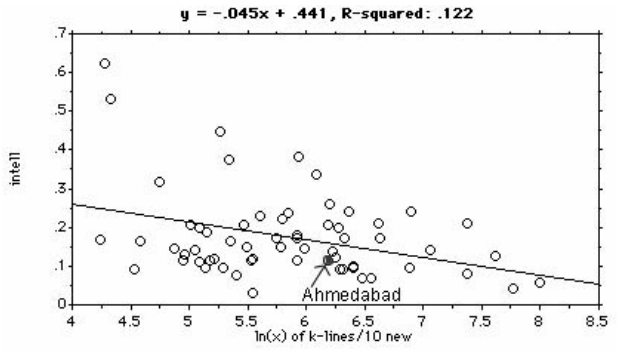

Figure 10: Scattergram - intelligibility vs. axial size

The correlation of global integration to connectivity (intelligibility) for Ahmedabad (0.1155) is found to be less than in the examples from the UK, Europe, Arab and US cities (Figure 10). It can be seen (Table 1) that, in terms of intelligibility, Ahmedabad is comparable to UK cities, whereas Islamic cities seem to have better intelligibility. Density and length of axial lines have a strong influence on intelligibility, which was argued to be the reason why naturally grown cities like those in UK or Iran become less intelligible as they grow bigger, while US cities, with longer lines, increase connectivity (Hillier, 1996).

Looking at the general pattern of integration, we know that axial lines in London are almost straight, and radiate from the centre like the spokes of a 'deformed wheel' (Hillier & Hanson, 1984), whereas in Ahmedabad the radiating spokes seems to converge towards the edge of the wall. But within the spaces of these radiating spokes, the broken short line structure becomes prominent, particularly in the residential areas of Ahmedabad. Hence in Ahmedabad (as in Islamic cities), more broken up lines in the inner residential areas, unlike those in other organic cities (for example London), account for lower intelligibility. This broken line structure Karimi (1999) argues is a cultural trait of Islamic cities, by which they restrain a stranger's movement through the residential streets. In Ahmedabad, these broken lines are a

prominent characteristics in pols, which might have been influenced by the pattern of Iranian and Arab cities, since the Mughal and Muslim rulers of 14-18th century in India were migrants from Middle East Asia. Ahmed Shah was no exception to this; therefore such a similarity could be due to these immigrant rulers.

Another interesting morphological characteristic of the walled city of Ahmedabad is the way in which the residential areas are differentiated from the integration core. The presence of a large number of dead-end streets in residential areas, and fewer connections globally, means low connectivity (2.971), which also accounts for the lower synergy value (0.193). This implies that local areas are globally separated, even in the case of residential areas very close to the centre. It seems that the pattern of Ahmedabad is to have more connections from the secondary streets to local streets, while spatially segregating the residential areas from the main street systems, resulting in lower connectivity and intelligibility. In terms of synergy, Ahmedabad (0.193) was found to have more than Arabian cities (0.16), but less than UK cities, and significantly less than European cities. This could be due to the fact that the radius, which picks up most of the local characteristics in Ahmedabad as it does in Arabian cities, is not radius 3 but radius 5 (due to the broken line structure), where we find a significantly better correlation (R2 = 0.4146).

The walled city of Ahmedabad has a deformed wheel pattern, similar to many naturally grown cities around the world, with an integration core in the centre and radiating streets connecting the centre to the edge, along with the dead-end street systems of residential areas. While the inner residential spaces and streets constitute the main socialising and meeting places for people within a particular area, the labyrinthine street pattern which discourages strangers' through-movements in an area, in reality offers alternative routes to its own members. This is because the correlation between visibility and accessibility is extremely low in the inner community spaces of Ahmedabad, while in most organic cities of Europe it is found to be high. Thus, we can convincingly argue that, in Ahmedabad, we have a city which in many syntactic characters is like naturally grown cities around the world, and in many morphological aspects is similar to Islamic cities. These differences and similarities can be seen as manifestations of cultural differences and local rules of place, making the individual city different from the 'fundamental city' (Hillier 1996). That is, the way the spaces are formed, appropriated and related is due to local rules defined by all the cultural groups in Ahmedabad while still showing the characteristics of a naturally grown city.

6. Are the Hindu and Muslim areas syntactically different?

Having established the general syntactic properties and how they compare with cities around the world, the next set of analyses looked at the relation of areas within Ahmedabad's walled city with each other, as well as to the city as a whole. Two types of spatial models (namely embedded and cut-out) have been found very useful in showing similarity and difference, as well as the relationships of the areas to the city as a whole.

Within all the areas looked at in detail, the mean integration value for Hindu areas is 0.822 calculated from the embedded model, and that of Muslim areas is 0.803. This difference, when verified through a t-test, is found not to be significant. Analysing these areas separately (cut-out model) reconfirms this result. When the areas were analysed separately, the mean local integration (with radius-3) values became increasingly similar, whereas mean local integration (with radius-5) value, when areas were analysed as part of the city (embedded model), shows that Muslim areas are more locally integrated than Hindu areas.

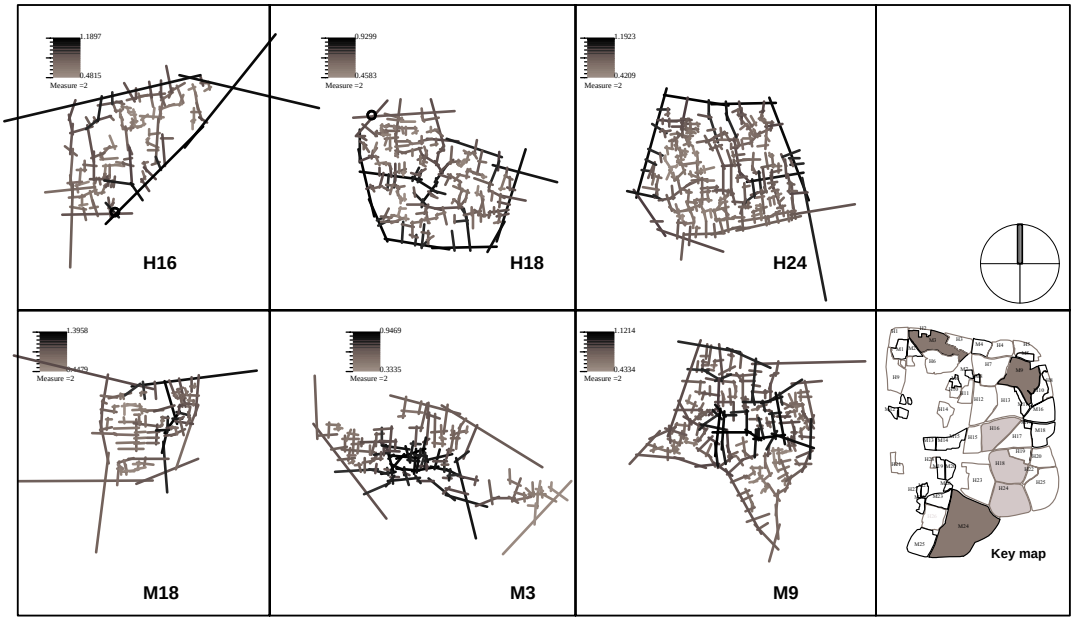

Figure 11: Comparison of Hindu and Muslim areas

In terms of connectivity, the Muslim areas have better connection within their spaces (3.348) than the Hindu areas (3.169). More interestingly, the intelligibility of the two sets of areas, when looked at in isolation, showed a significant difference, with the Muslim areas more intelligible that the Hindu areas. This was not found to be significant in the embedded model, but the result again supports the earlier argument that the Muslim areas have better local integration than Hindu areas. If we look at the pattern of integration (Figure 8) we see a distinct difference in terms of patterns in the north and south of the integration core. We can see that in the

north, inner spaces within a block are picked up in a warmer colour, whereas on the south side the boundaries of the area (or block) are more prominent. This, when looked at in conjunction with the community landscape of the city (Figure 2), shows that prominent clustering of the Hindu and Muslim communities are on the south and north respectively. Detailed analysis using higher radii (5.7 and 9) for local integration showed differences in patterns of integration between the Hindu areas, which have highly integrated spaces on the edges, and the Muslim areas, which have their local integration core in the inner spaces of blocks in the embedded model. This phenomenon is even more evident when the two sets of areas are looked at separately (cut-out model) (Figure 11).

Having found clear similarities in the syntactic values of Hindu and Muslim areas it became evident that the morphological differences in the axial analysis could be the key difference between these areas. The key morphological characteristics compared in this study were the angle of incidence; dead-end street pattern, and pattern of integration. We know from comparative studies of Iranian and English cities (Karimi, 1999) that in Islamic cities the angle of incidence between two axial lines tends to be more like a right angle, in contrast to the 10°-15º in European and English cities. The difference between Ahmedabad and Islamic cities is that while its main road system has angles of incidence more like European samples, its inner residential area is very much like the Iranian examples, with right-angled connections. This is particularly evident in Muslim areas (Figure 13). The ranges of angles of incidence between lines show differences between Hindu and Muslim areas. While Hindu areas show a wider range of deviation, between 10°-45º from a straight line, in Muslim areas there are more lines that intersect at right angles.

Because of these short lines with fewer and right-angled connections, one finds very segregated spaces within two changes in direction from the most integrated spaces in Ahmedabad. An example of this phenomenon can be seen in residential areas along main axis, like Gandhi Road. This deliberate way of segregating spaces in Hindu areas, especially in the centre, is argued to be the reason for the comparable mean integration values of Hindu and Muslim areas, although it was initially assumed that the former would have higher integration values.

Looking at another significant morphological characteristic, that is, the dead-end street pattern (tree-like pattern) inside a particular pol, it can be noticed that the Muslim areas have more dead-end streets, especially in the recently redeveloped areas in Kalupur Ward (N-W on Figure 7). As stated earlier, the pols were intended primarily as residential areas for people from the same caste and religion, in most

instances following the same trade. The particular socio-economic situation demanded organised living to protect the inhabitants against invaders in the distant past, and against rioters in the recent past. Gillion (1968) pointed this out as the reason for the protective gates (Dwarwaza) and the development of the labyrinthine street patterns of the pols of Ahmedabad.

Having found some differences in terms of morphological and syntactic measurements between these areas, it became important to investigate the relationship of the areas to each other, to find if they are separated and isolated, or related to each other. Historically, we know that these areas were developed as independent settlements, which merged as the settlements grew. To look at this, interface spaces between different areas were compared. Statistics show fewer differences, morphologically, between two Hindu areas. They seem to have better links than between two Muslim or between a Hindu and a Muslim area. These better connections are due to sets of longer lines which connect the two areas (Figure 12). So, we can see that both religious groups are distinct in themselves, avoiding spatial connections and thus attempting to preserve a typical lifestyle, daily ritual and hence culture, by spatially segregating themselves from each other. This could be one of the reasons why these areas remained isolated islands of culture for many centuries, but it is not the only reason, as explained before.

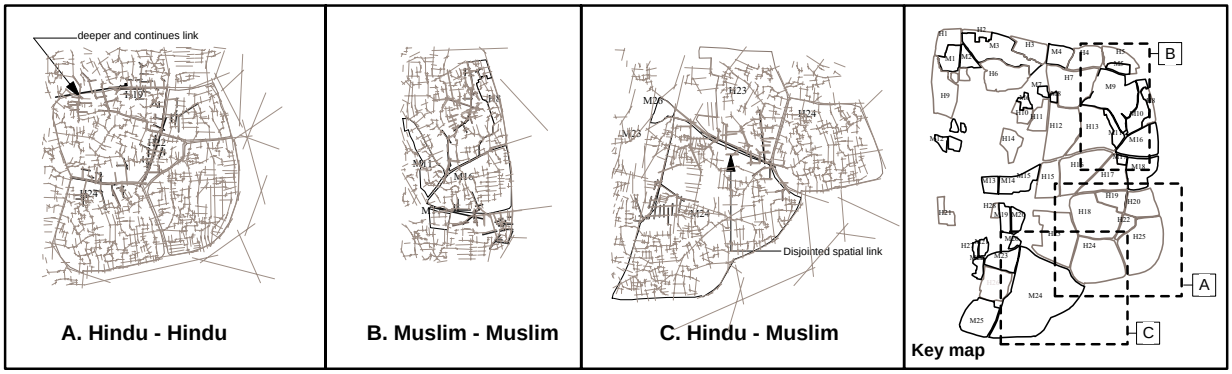

Figure 12: Interface between communitiesTable 2. Comparison of synergy values of most integrated spaces within a communityTable 2. Comparison of synergy values of most integrated spaces within a community

Finally, we ask: are these areas differently related to the city as a whole? We know from the history of Ahmedabad that the Hindu communities are located towards the centre and the Muslim towards the edge of the walled area. While the choice location of Muslim areas was related to historical developments, such as the economic situation of the 19th and 20th centuries, as well as the Islamic tradition, the merchant Hindu, located themselves in the centre communities for safety as well as for the potential of commerce. Today, due to all the reasons stated above, we see the Muslim areas predominantly in globally less integrated zones within the walled city. The

global integration pattern (Figure 7) shows that the areas in the northern side of the central integration core are globally less integrated. The only exception to this is the old ceremonial axis, which by itself is less connected to the communities around it. Therefore, we have a majority of Muslims in areas on the periphery or in segregated areas on the northern side, while Hindus mostly occupy the more central and globally more integrated locations.

This spatial pattern also seems to influence the land use patterns. For example, we can see in Hindu areas retail streets embedded within residential areas, whereas in Muslim areas, this happens only in those streets that are adjacent to the main retail streets, such as Relief Road and Gandhi Road. Moreover, land use in Ahmedabad is greatly influenced by the historical development (as explained before) of commerce within the city, arguably the reason for the high number of commercial buildings within Hindu (and Jain) areas. Due to this large commercial land use, Hindu areas have a strong retail frontage, which forms an impenetrable frontage for the blocks, which Muslim areas lack. The comparison of land use (Figure 3) to global integration map (Figure 7) and community landscape (Figure 2) shows this phenomenon clearly. In Ahmedabad, the Hindu areas with high pedestrian through movement consolidated commercial land use into the highly integrated edges of the blocks. Thus Hindu areas, which have their local integration core on the edges which also act as globally connecting spaces (see Table 2 which shows better synergy in Hindu integration core) seem to be more connected to the city. This relation of Hindu areas to the city partially explains phenomena like their late night markets and shopping, which is obviously affected by their culture and is refined by the typical hot climate of the region.

Looking at the pedestrian movements within areas, Hindu areas with local integration cores on their edges, encourage strong edge movement, and to some extent through movement, within them. However, the location of the local integration core deep inside the Muslim areas, which are, furthermore, segregated from their own boundaries by right-angle connections, seems to discourage strangers' movements. This was evident during the fieldwork during which it was very noticeable that there were fewer people in the inner spaces of Muslim areas other than their occupants. In Hindu areas, the most integrated spaces being on the outer edge, had many more people using them for through-movements. Therefore, in Muslim areas the local integration core keeps itself spatially separated from the main movement of the city, while the Hindu areas, making their edges more locally integrated, makes them also part of the global connection, encouraging pedestrian movements. This effect can be clearly seen when the synergy values of locally highly integrated spaces of Hindu and Muslim areas are compared in an embedded model. The result shows that the mean synergy values of the most integrated spaces of Hindu areas are significantly higher than those of Muslim areas (Table 2).

Table 2. Comparison of synergy values of most integrated spaces within a community

Areas	Synergy Rn/R3	Rn/R5	Remarks
Hindu	0.28	0.0111	mean value of most integrated spaces within a community
Muslim	0.0879	0.005	mean value of most integrated spaces within a community
mean value of walled city	0.1931	0.4146	
Hindu	0.4	0.698	mean value of all the spaceswithin
Muslims	0.447	0.685	mean value of all the spaceswithin

In looking at the syntactic and morphological differences between the Hindu and Muslim areas, we found more similarities in terms of their syntactic measures. While Hindu areas capitalise on the potential of their integrated streets for both defining their boundaries as well as enhancing commerce, they segregate the inner spaces of their areas. Thus their mean syntactic measures become comparable to those of Muslim areas. In contrast, most of the Muslim areas, being positioned at the edges, are more segregated from the city as a whole, in line with their typical social structure, but keep the spaces inside each area more organised and integrated than Hindu areas. What can be concluded from these findings is that while the organisation principles in the two areas are different, they have kept the syntactic quality of spaces more or less the same. The effect of these morphological differences is argued in this study to be caused by cultural differences, manifested in many day-to-day social patterns, such as the night life of the streets and so on.

What can be the reason for differences in the way in which the spaces are used, when the syntactic measure shows that spatially they are not so different? The answer might lie in the fact that whilst culture influences the formation of spaces, space also influences the culture of a place. That is, in the context of Ahmedabad, the existing spaces of settlements were adapted or modified when the new immigrants moved into the spaces left behind by previous occupants. This happened, as reported by Gallion (1968) and Watakchand (1851), when early Muslim migrants moved into the walled city area, which was then called Karnavati, a small village. Later the ruling Muslim community moved to the strategic gates of the walled city during Ahmed Shah's reign. Again, in the 20th century, Hindus migrated to areas left behind by Muslims as they moved to the edge of walled city. These migrations and movements of cultural groups within the walled city resulted in consolidating or weakening local spatial linkages between the blocks. Hence it is proposed that there is a lot of adaptation in terms of spatial culture when people live together in the same city. This spatial adaptation can be due to the adaptation of some local customs and culture by a migrant community, while social reproduction of rituals and habits keeps the inherent culture of the religious groups unchanged. Therefore, it is proposed here that what we see in Ahmedabad is a stronger social and religious pattern trying

to overcome spatial similarity of the adopted spaces. Hence, the cultural and religious norms regarding the socialising patterns of men and women, children and adults, and inhabitants and strangers-visitors are different and stronger in different areas. In other words, what happens in Ahmedabad is a reproduction of a social pattern rather than of a spatial pattern. This explains the similarities in syntactic measures, while there are differences in use patterns and the morphology of spaces.

7. Conclusion

Previous comparative studies of European and Islamic cities have shown spatial and syntactic differences between them. A cultural difference has been put forward as one of the main reasons for these differences. The general aim of this study was to investigate any differences in 'spatial culture' of distinct areas within a city where distinct religious groups live. Understanding how culture and space are fine-tuned to integrate or segregate communities could help us to develop strategies for effective as well as socially and culturally sensitive spatial planning of these cities. For the purpose of this research, the walled city of Ahmedabad was chosen, where two different religious communities (namely Hindu and Muslim) occupy well-defined areas. Investigation of the spatial pattern and the syntactic properties of these areas revealed many similarities between them. It emerged that in Ahmedabad a strong cultural and religious pattern of distinct groups is trying to overcome the similarities of spaces which were adopted by them. However, an in depth analysis showed some interesting differences between these areas.

1. The way these areas are related to the city: differences were mainly due to the position of areas within the city.
2. The areas themselves were found to be independent and self-contained, i.e. not spatially linked to one another.
3. Even though the areas were comparable in terms of their syntactic measures, and therefore spatially not as different as expected, morphologically they have different spatial structures and geometries. Two main differences between the spatial morphology of these areas were 1) in their local integration core. The Hindu areas have their local core on their edge, while the Muslim areas have a centrally-located local integration core; 2) Hindu areas were found to be better connected with other Hindu areas, but analysis showed very weak spatial linkages between the areas of Hindu and Muslim communities.

In Ahmedabad the areas which originated, grew and existed as independent and unlinked entities, housing culturally distinct communities with strong social and religious laws, can be seen as one of the main reasons for its fragile social relationships. These cause more riots and communal tension within the walled city

than in other parts the city. Hence physical development aimed at bettering economic and infrastructure needs will only be successful in creating harmony if the socio-spatial isolation of communities are addressed along with it. That is, integrating these communities culturally and spatially could help to achieve a more coherent and socially sustainable community.

Notes

[1] Pols are residential areas occupied by a set of people from the same religious background, often involved in the same trade. Many of these residential areas are gated, and have within a labyrinthine street system

[2] City gates

[3] Central market area

[4] The term 'Integration core' is used to indicate the area where there is a concentration of the most integrated lines in the axial map

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