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DOI
10.1162/jinh_a_01304
Publication date
2018
Document Version
Final published version
Published in
Journal of Interdisciplinary History

Journal of Interdisciplinary History, XLIX:3 (Winter, 2019), 445–472.

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Spatio-Syntactical Analysis and Historical Spatial Potentials: The Case of Jaffa–Tel Aviv

This research note examines the added value of spatio-syntactical analysis in the writing of urban history by providing a diachronic outlook on the transformations of the urban area of Jaffa and Tel Aviv (present-day Tel Aviv–Yafo). The space-syntax approach to spatial analysis, which crystalized during the 1980s, is based on the theoretical work of Hillier and Hanson. Its main argument is that the spatial organization of a town or a city directly affects the ways by which people perceive, move through, or use space—or, in Hillier's own words, "How the urban system is put together spatially is the source of everything else." Space-syntax methodology utilizes a mathematical representation of streets and open spaces to quantify their hierarchical position within a given street network. The quantification then becomes an indicator of the magnitude of movement passing through the streets and the types of activities that they attract. Despite some unresolved methodological problems, space syntax, as a static model of urban life and activities, has gained a considerable amount of scholarly recognition, backed

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by empirical evidence that supports its use as a reliable tool for predicting urban movement patterns.[1]

The predictive capacity of space-syntax analysis renders it an attractive methodology for urban planning and design, a way for planners to "simulate" the impact of their actions on the use of space. Yet the capacity of the method to indicate how an urban system functions is also theoretically applicable in retrospect, for describing (or rather "postdicting") certain social aspects of past urban configurations, relying on their spatial properties. In a recent comprehensive article, Griffiths highlighted the prospects of integrating this methodology into the historical study of cities, calling for its adoption by urban historians alongside the analysis of texts, maps, and imagery. According to Griffiths, "The promise of space syntax for historians is that it provides a way into conceptualizing and thinking about the role of 'space' and its relation to life in the built environment that does not rely uncritically on powerful images imported from well-established historical discourses." Space syntax can therefore "improve historians' understanding of how changes in the shape of habitable space affected people's lives and urban culture in particular times and places" by offering a kind of "unbiased" quantitative description encompassing an entire townscape. It also provides perspectives on past events that are vastly different from the perspectives offered by personal documents, testimonies, and recollections.[2]

1 Bill Hillier, *Space Is the Machine: A Configurational Theory of Architecture (Electronic Edition)* (London, 2007), 126. For the basic foundations of space-syntax theory, see also Hillier and Julienne Hanson, *The Social Logic of Space* (Cambridge, Mass., 1984); for the relationship between the spatial layout of a city and the social life of cities, Alan Penn, "Space Syntax and Spatial Cognition: Or Why the Axial Line?" *Environment & Behavior*, XXXV (2003), 30–65; Hillier and Shinichi Iida, "Network and Psychological Effects in Urban Movement," in Anthony G. Cohn and David M. Mark (eds.), *Spatial Information Theory: Proceedings of the International Conference on Spatial Information Theory Cosit 2005* (Berlin, 2005), 475–490; Kayvan Karimi, "A Configurational Approach to Analytical Urban Design: 'Space Syntax' Methodology," *Urban Design International*, XVII (2012), 297–318; for criticism of space syntax theory, Carlo Ratti, "Space Syntax: Some Inconsistencies," *Environment and Planning B: Planning and Design*, XXXI (2004), 487–499; Jingwen Wang, Qing Zhu, and Qizhi Mao, "The Three Dimensional Extension of Space Syntax," paper delivered at the 6th International Space Syntax Symposium, Istanbul, 2007; Michael Batty, *The New Science of Cities* (Cambridge, Mass., 2013); for the current application of space syntax in urban planning, Noah Raford, "Social and Technical Challenges to the Adoption of Space Syntax Methodologies as a Planning Support Systems (PSS) in American Urban Design," *Journal of Space Syntax*, I (2010), 230–245.

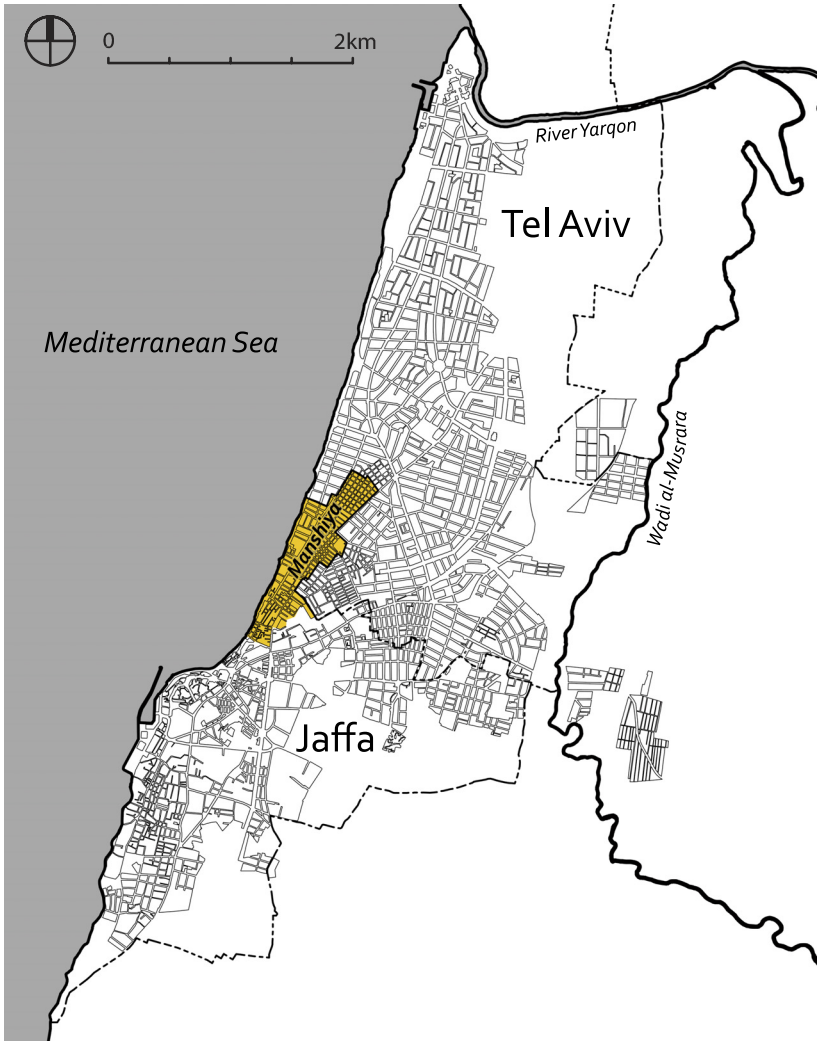
2 Sam Griffiths, "The Use of Space Syntax in Historical Research: Current Practice and Future Possibilities," paper delivered at the 8th International Space Syntax Symposium,

The uncommon historical case of the two interconnected, yet divided, cities of Tel Aviv and Jaffa provides a valuable opportunity to examine the advantages, as well as the limitations, of applying spatio-syntactical analysis to historical research. Tel Aviv, originally a neighborhood within Jaffa, became a semi-independent town in 1921, following an ordinance issued by the British administration in Palestine that effectively divided the municipal territory of Jaffa, an ethnically mixed city, in two, thereby creating a new "all-Hebrew city" on Jaffa's northern periphery (Figure 1). However, this allegedly clear division between ethnically distinct populations ("Hebrew" and "Arab"), which was dictated by official documents and maps, had no physical presence on the ground. The boundary between the two cities was left on paper; movement between their territories remained unobstructed by physical barriers. Moreover, following the creation of this "paper boundary," both cities gradually shifted into leading separate lives, while escalating ethnic tensions between their populations reinforced a de-facto division of space. Jaffa became a "partitioned city" unlike other cities that became divided during the twentieth century (for example, Berlin during the Cold War, Jerusalem between 1948 and 1967, and Nicosia since 1974), since its partition did not rely on physical obstructions of any sort.[3]

Santiago, Chile, 2012, 9, 17. Several recent archaeological studies about excavated towns employed space-syntax analyses, drawing parallels between the spatial configuration of settlements and urban life as reflected by the physical artifacts found during excavations. See Marlous Craane, "The Medieval Urban 'Movement Economy': Using Space Syntax in the Study of the Medieval Urban Network as Exemplified by the Bailiwick of 'S-Hertogenbosch, the Netherlands," paper delivered at the 7th International Space Syntax Symposium, Stockholm, 2009; Hanna Stöger, "The Spatial Organisation of the Movement Economy: The Analysis of Ostia's *Scholae*," in Ray Laurence and David J. Newsome (eds.), *Rome, Ostia, Pompeii: Movement and Space* (Oxford, 2011), 215–244; van Nes, "Measuring Spatial Visibility, Adjacency, Permeability and Degrees of Street Life in Pompeii," in Laurence and Newsome (eds.), *Rome, Ostia, Pompeii*, 100–117.

3 Although the term *divided city* appears in current literature about urban areas partitioned between two (mainly hostile) entities, it also can describe other, more ambiguous, intra-urban social divisions that are less clearly defined in a territorial sense and, more importantly, do not have to rely on a concrete official decision to divide an urban area. Therefore, following previous works, we use another common term, *partitioned city*, to describe the case of Jaffa–Tel Aviv: Nurit Kliot and Yoel Mansfeld, "Case Studies of Conflict and Territorial Organization in Divided Cities," *Progress in Planning*, VII (1999), 167–225; Scott A. Bollens, *On Narrow Ground: Urban Policy and Ethnic Conflict in Jerusalem and Belfast* (Albany, 2000), 3–18; Marco Allegra, Anna Casaglia, and Jonathan Rokem, "The Political Geographies of Urban Polarization: A Critical Review of Research on Divided Cities," *Geography Compass*, VI (2012),

Fig. 1 Jaffa and Tel Aviv in 1948, Showing the "Paper Boundary" between the Cities and the Location of the Central Manshiya Quarter



560–574; Nahum Karlinsky, "Tel Aviv and Jaffa before 1948: The Underground Story," in Maoz Azaryahu and S. Ilan Troen (eds.), *Tel-Aviv, the First Century: Visions, Designs, Actualities* (Bloomington, 2012), 138–164.

Space-syntax analysis has long been applied in morphological studies of partitioned cities, where division lines physically prevented or controlled movement between urban territories. Examples from such past studies—such as Berlin before and after reunification, Belfast with its peace walls between Catholics and Protestants, and Beirut's division lines of the civil-war years—indicate that physical divisions within an urban network affect the social and economic lives of cities, as well as their center–periphery relations. Intra-urban *paper boundaries*—defined herein as nonphysical borders based exclusively on graphical and textual representations external to an actual territory—have received much less attention. Even though they have no tangible physical presence in a city, they do have a hold on the spatial perception of urban space; given the right conditions (like fierce ethnic conflict between Arabs and Jews in the case of Jaffa and Tel Aviv), they can potentially have an effect on city life similar to that of physical borders.[4]

SPACE–SYNTAX METHODOLOGY'S SIGNIFICANCE FOR THE HISTORICAL RESEARCH OF CITIES In his article about space syntax and historical research, Griffiths identified four approaches to coupling historical research and space-syntax techniques:

(1) *History as "Background"* In this approach, historical information is used only as a basic exposition of an urban situation, an introduction to a purely syntactical analysis of a certain location. The historical review provides context for a specific case study in which the issue of historical transformations and events is not addressed, since such a study does not involve a diachronic syntactical analysis.

(2) *Syntactical Growth Processes* This nomenclature refers to historical information used for the morphological analysis of

4 For space-syntax analyses of partitioned cities, see Jake Desyllas, "The Relationship between Urban Street Configuration and Office Rent Patterns in Berlin," unpub. Ph.D diss. (Univ. College London, 2000); Ernst More, "Troubles on the Belfast Roads: Creating Plans for Contested Cities," unpub. Master of Science thesis (TU Delft, 2010); Kayvan Karimi, "Beirut: Normalities and Abnormalities of a Complex City," *Journal of Space Syntax*, IV (2013), 109–122; for borders as symbols and manifestations of power relations, David Newman and Anssi Paasi, "Fences and Neighbours in the Postmodern World: Boundary Narratives in Political Geography," *Progress in Human Geography*, XXII (1998), 186–207; for intra-urban administrative borders shaping urban life, Werner Breitung, "Borders and the City: Intra-Urban Boundaries in Guangzhou (China)," *Quaestiones Geographicae*, XXX (2011), 55–61.

diachronic transformations in human settlements. In this type of research, the historical sources are predominately original cartographical materials that help to reconstruct past street networks and their change over time. These historical research methods mainly generate evidence for the existence of past street networks, without being considered in the interpretation of spatial-analysis results.

(3) *Syntactical Morphological Histories* These histories comprise the data deployed to trace the morphological changes to cities following important events. They center primarily around the spatial configuration of street networks and their evolution over time while using socio-historical evidence for explicating the driving forces behind the evolution. Griffiths describes these histories as "by far the largest" of the four categories.

(4) *Spatial-Locational Histories* Space-syntax analysis is applied as a part of a broader historical analysis to explicate socio-historical phenomena organized in time and space. In contrast to the three other approaches, space syntax is not the main research method for describing a historical process but rather an additional layer of information, which supports the study of the non-morphological aspects of urban life across time.[5]

According to Griffiths, the first three approaches have a substantial presence in current space-syntax literature but not the fourth approach. Since few writers of urban history are familiar with morphological research methods and syntactical analysis of cities, they rarely address questions pertaining to the physical growth, evolution, and configuration of cities. In recent years, however, Griffiths, who is currently a leading proponent of this approach, and a few other scholars have attempted to integrate space-syntax methodologies into the writing of urban history.[6]

5 Griffiths, "Use of Space Syntax."

6 For studies conforming to Griffiths' fourth category, see Jianfei Zhu, *Chinese Spatial Strategies: Imperial Beijing, 1420–1911* (New York, 2004); Laura Vaughan and Penn, "Jewish Immigrant Settlement Patterns in Manchester and Leeds 1881," *Urban Studies*, XVIII (2006), 653–671; Griffiths, "Historical Space and the Interpretation of Urban Transformation: The Spatiality of Social and Cultural Change in Sheffield C.1770–1910," unpub. Ph.d. diss. (Univ. College, London, 2008); Craane, "Medieval Urban 'Movement Economy'"; Griffiths, "Persistence and Change in the Spatio-Temporal Description of Sheffield Parish c. 1750–1905," paper delivered at the 7th International Space Syntax Symposium, Stockholm, 2009; *idem*, "Temporality in Hillier and Hanson's Theory of Spatial Description: Some Implications of Historical Research for Space Syntax," *Journal of Space Syntax*, II (2011), 73–96; *idem*,

Griffiths' advocacy for space-syntax integration into historical research is founded on the assumption of a direct correlation between urban morphology (or its interpretation through space-syntax methodology) and the way in which urban space is used. In other words, the knowledge that a certain urban space was centrally located within an urban street network can lead to the assumption that it also attracted more movement and therefore became central to the life of a city. Hence, space syntax could theoretically serve as a powerful key to decipher or interpret the "past lives" of cities, even when external historical evidence is ambiguous, lacking, or totally missing.

Although space syntax can contribute to the development of new perspectives in urban studies and urban history, an uncritical acceptance of its "postdictive" capacities could prove problematical when dealing with the peculiarities of the past. Given that detailed historical records of movement patterns are rarely available, the reconstruction of past movement patterns relying only on space-syntax analysis is more cumbersome than is the use of space syntax for contemporary design purposes, in which validation through movement counts is more easily attainable. Therefore, although space syntax can benefit the historical research of cities, its contribution may not lie so much in its "postdictive" capacities as in its enabling a comparison between a city's morphological infrastructure, or the spatial "code," and its actual use, as reflected from other sources of information.

When integrated into historical research, results of space-syntax analysis should be mainly regarded as descriptions of morphological or configurational properties of historical street networks. Locations may appear central within a network, but any final verdict as to their centrality should not rely solely on space syntax but also on support from additional or complementary historical testimonies and evidence. The juxtaposition of the syntactical properties of urban space and its recorded history can reveal the extent to which the spatial configuration of a city affected how people acted within its public spaces. In other words, space-syntax analysis can produce a

"The Use of Space Syntax in Historical Research: Current Practice and Future Possibilities," paper delivered at the 8th International Space Syntax Symposium, Santiago, 2012; *idem* et al., "Using Space Syntax and Historical Land-Use Data to Interrogate Narratives of High Street 'Decline' in Two Greater London Suburbs," paper delivered at the 9th International Space Syntax Symposium, Seoul, 2013.

description of an urban location's "spatial potential," whereas complementary historical data can help to determine whether the location realized this potential.

The results of space-syntax analysis in a historical context should therefore be interpreted with reference to historical sources about a city, especially the use and perception of its central locations. Such an integrated analysis could reveal substantial discrepancies between movement "postdictions" extracted via space-syntax analysis and recorded historical realities, exposing unrealized spatial potentials. The existence of such discrepancies can indicate that certain social forces had a stronger influence on urban behavioral trends than the purely physical configuration of the street network. At the same time, correlation between a morphological analysis and historical evidence can indicate that the physical configuration of a city held a dominant position in shaping its social life, resulting in the full realization of the city's spatial potential. Diachronic analysis can also reveal that even though a city might have realized its spatial potential for a certain period of time, it failed to do so in other periods.

The integration of space-syntax analysis into the writing of urban history not only stands to "improve historians' understanding of how changes in the shape of habitable space affected people's lives and urban culture in particular times and places" (to use Griffiths' words) but also to improve their ability to assess the changing interplay of configurational and social forces in the actual use of space. As such, space syntax can become a powerful tool in the writing of urban history. The historical case of Jaffa and Tel Aviv, with its underlying ethnic conflict that played out spatially, aptly demonstrates this point.[7]

THE SPATIAL EVOLUTION OF JAFFA–TEL AVIV Jaffa is a historic port city on the shores of the Mediterranean Sea, with a recorded history of about four millennia. In the early 1870s, it was the main harbor of Ottoman Palestine, despite being a relatively small walled town of about 5,000 inhabitants. A single gate in its walls connected the town's biggest bazaar and mosque to the main roads leading to the cities of Jerusalem, Nablus, and Gaza. Vast cultivated areas of citrus groves, for which Jaffa's name was famous in European countries, extended east and south of the walls.

7 Griffiths, "Use of Space Syntax in Historical Research," 17.

During the 1870s, the town walls were partially removed, and new commercial and residential buildings were built along the main roads extending from the town's center. About a decade later, rapid urban expansion to the north of the historical core, an area of sand dunes, became Jaffa's new commercial and residential hub. This development unfolded sporadically, driven by various private initiatives and expedited by increasing Jewish immigration to Palestine, which created an exceptional demand for housing in Jaffa. Although Jaffa's expansion was not restricted to the area north of the historical core, the emerging northern quarter was far more urbanized in nature than Jaffa's expansion to the south. The difference in character between the northern and southern extensions of the city grew more pronounced following the opening of Jaffa's first train station in the northern part of the town in 1892. Jaffa's main northern quarter was ethnically mixed (populated mainly by Arabs and Jews), and was commonly known by the name "Manshiya," though its Jewish residents had a Hebrew name for it, "Neve Shalom."[8]

The Founding of Tel Aviv A private Jewish association for housing built the first organized settlement in the northern part of Jaffa (the Neve Tzedeq neighborhood, 1887). Similar schemes during the 1890s and 1900s led to the establishment of a few other small neighborhoods, including the Jewish neighborhood of Tel Aviv, founded in 1909. Unlike its predecessors, Tel Aviv's founding was a proclaimed Zionist enterprise, strongly related to what can be described as the "Hebrew cultural project" in Palestine. One of the project's main ambitions was the creation of new, "Hebrew" forms of settlement in which the physical environment would support a transformation of the Jewish people into an autonomous modern nation. Thus, Tel Aviv was conceived and developed as a "Hebrew city," the first of its kind worldwide, long before its officially granted, independent status; this concept shaped daily life in the neighborhood and some of its spatial and architectural characteristics.[9]

8 For the development of Jaffa during the second half of the nineteenth century, see Ruth Kark, *Jaffa: A City in Evolution, 1799–1917* (Jerusalem, 1990); Great Britain Colonial Office, *Palestine: Disturbances in May, 1921. Reports of the Commission of Inquiry with Correspondence Relating Thereto, Cmd 1540* (London, 1921); Aleksandrowicz, "Paper Boundaries: The Erased History of the Neighborhood of Neveh Shalom [in Hebrew]," *Teoria UVikoret (Theory and Criticism)*, XLI (2013), 165–198.

9 For the Hebrew ideology behind the foundation and building of Tel Aviv, see Yosef Katz, "Ahuzat Bayit Association 1906–1909: Setting the Foundations for Tel-Aviv [in Hebrew],"

Under the rule of the Ottomans, who were openly hostile to political Zionism, Tel Aviv's ambitions to become an independent city had little chance to find a sympathetic ear among local administrators. New opportunities opened after the British occupation of Palestine in late 1917. In July 1920, a High Commissioner for Palestine, Herbert Samuel, who was Jewish, was appointed head of the country's local civil government. Less than three weeks after Samuel took office, the leaders of Tel Aviv petitioned him for a partial independence from the Jaffa municipality. The British administration favored the idea, and Jaffa's municipality did not oppose it. Hence, an official ordinance granting Tel Aviv the legal status of a "township" was published on May 11, 1921, coming into effect after less than three weeks. The "Hebrew city" concept clearly shaped the newly drawn border between Jaffa and Tel Aviv: Tel Aviv's territory extended over almost all of the Jewish neighborhoods in northern Jaffa, except for ethnically mixed quarters like that of Manshiya/Neve Shalom (Figure 1).[10]

The new municipal border that divided the urban fabric had no roots in the self-organization of the urban activities, no conspicuous physical elements to delineate it, and no existing cognitive divisions to justify it. Moreover, as with almost any municipal boundaries, the new border lacked physical manifestations, making it impossible to see where exactly Jaffa ends and Tel Aviv begins. Nevertheless, as a cultural tool for shaping a common cognitive division of urban space, the new boundary proved to be more than effective.

The Social Division of Urban Space During the 1920s, ethnic tensions between Arabs and Jews in Palestine grew stronger, beginning with the May 1921 riots in Jaffa and culminating in a wave

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Cathedra, XXXIII (1984), 161–191; Itamar Even-Zohar, "The Emergence of a Native Hebrew Culture in Palestine, 1882–1948," *Polysystem Studies*, XI (1990), 175–191; Eyal Chowers, "The End of Building: Zionism and the Politics of the Concrete," *Review of Politics*, LXIV (2002), 599–626; Anat Helman, "'Even the Dogs in the Street Bark in Hebrew': National Ideology and Everyday Culture in Tel-Aviv," *Jewish Quarterly Review*, XCII (2002), 359–382; Nathan Harpaz, *Zionist Architecture and Town Planning: The Building of Tel Aviv (1919–1929)* (West Lafayette, 2013).

10 For the events that resulted in Tel Aviv's independence from Jaffa and their effect on sustaining and reinforcing the Hebrew image of Tel Aviv, see Yaacov Shavit and Gideon Biger, *The History of Tel Aviv: The Birth of a Town (1909–1936) [in Hebrew]* (Tel Aviv, 2001), 159–163; Shavit, "Telling the Story of a Hebrew City," in Maoz Azaryahu and S. Ilan Troen (eds.), *Tel-Aviv, the First Century: Visions, Designs, Actualities* (Bloomington, 2012), 3–12.

of murderous attacks on Jews in August 1929 in the old Jewish communities of Jerusalem, Hebron, and Safed. As a result, the division of urban space according to ethnic definitions became more acceptable both in Jaffa and in Tel Aviv. The parts of northern Jaffa that fell under the powers of Tel Aviv were regarded a "Hebrew" territory, whereas the territories on the Jaffa side of the border were perceived as purely "Arab." Although daily travels between the cities continued, the cities' economic ties gradually disintegrated; Jewish businesses moved out of Jaffa and into Tel Aviv. The Arab revolt of 1936 to 1939, which had a devastating effect on Jaffa's economy, further pushed the cities apart, resulting in almost complete social separation. Although interconnections resumed during the calmer years of World War II (1939–1945), the end of the war and the imminent termination of the British Mandate marked the beginning of a renewed violent escalation that finally led to the 1948 Arab–Israeli War.[11]

The immediate effect of Tel Aviv's achievement of semi-independent status in June 1921 was the division of planning powers between the Jaffa municipality and the new township of Tel Aviv, which had a dramatic effect on Jaffa's urban development. In 1925, the invitation from Tel Aviv (at that time no more than an agglomeration of small neighborhoods) to Patrick Geddes, a renowned Scottish town planner, to produce its first masterplan reinforced the cultural distinction between Jaffa and Tel Aviv, at least in the eyes of the Jewish population. Tel Aviv aimed to differentiate itself from Jaffa by emphasizing its Hebrew character (as contrasted with "Arab" Jaffa) and by modernizing its built form,

11 For the deteriorating ethnic relations in Jaffa-Tel Aviv since the 1920s, see Tamir Goren, "Relations between Tel Aviv and Jaffa 1921–1936: A Reassessment," *Journal of Israeli History*, XXXVI (2017), 1–21; *idem*, "Tel Aviv and the Question of Separation from Jaffa 1921–1936," *Middle Eastern Studies*, LII (2016), 473–487; *idem*, "The Jews of Jaffa at the Time of the Arab Revolt: The Emergence of the Demand for Annexation," *Journal of Modern Jewish Studies*, XV (2015), 267–281; *idem*, "The Second World War as a Turning Point in Arab–Jewish Relations: The Case of Jaffa and Tel Aviv," *Middle Eastern Studies*, LIV (2017), 216–237; Itamar Radai, "Jaffa, 1948: The Fall of a City," *Journal of Israeli History*, XXX (2011), 23–43. During the Arab Revolt, the idea of a political partition of Palestine between an Arab state and a Jewish State emerged in the work of the Peel Commission in 1937 and the Woodhead commission in the following year. Both commissions recommended the inclusion of Jaffa in the Arab state and of Tel Aviv in the Jewish state, implying that the border between the cities could become much more than an administrative municipal tool. See Palestine Royal Commission, *Report* (London, 1937); Palestine Partition Commission, *Report* (London, 1938).

allegedly to distinguish itself from the "traditional" and "oriental" character of its mother city. Geddes' plan assisted in creating a distinct spatial order that was meant to shift Tel Aviv's center of gravity to the north, as far as possible from Jaffa's historical core (the part confined to the city walls until the early 1870s) and even from the older parts of northern Jaffa, namely, the former commercial hub of Manshiya/Neve Shalom.[12]

The combined effect of ethnic violence, the administrative division of urban space, and the emergence of a cognitive territorial division on ethnic grounds left a salient mark on the position of Manshiya/Neve Shalom within the urban system of Jaffa and Tel Aviv. Between the 1890s and the mid-1920s, Manshiya/Neve Shalom was an important commercial hub for both Jaffa and Tel Aviv. By the end of the 1920s, however, when Tel Aviv's commercial activities had rapidly shifted north and east, Manshiya/Neve Shalom's economic significance and status substantially declined. Despite its central location within the intertwined street network of Jaffa and Tel Aviv, the neighborhood became marginal in the life of both cities, attracting primarily low-income Arab and Jewish populations; the general public in both cities started to perceive it as nothing more than a slum. During the 1940s, the Jaffa municipality even promoted two masterplans for the total "reconstruction" (effectively meaning demolition and rebuilding) of the neighborhood, reflecting its eroded reputation.[13]

Another indication of the public's perception of Manshiya/Neve Shalom was a linguistic shift in how Jews tended to describe the neighborhood. In the early 1930s, Hebrew speakers started to

12 Patrick Geddes, "Town Planning Report Tel-Aviv" (Tel Aviv, 1925). For critical appraisals of Geddes' plan, see Neal I. Payton, "The Machine in the Garden City: Patrick Geddes' Plan for Tel Aviv," *Planning Perspectives*, X (1995), 359–381; Rachel Kallus, "Patrick Geddes and the Evolution of a Housing Type in Tel-Aviv," *Planning Perspectives*, XII (1997), 281–320; Volker M. Welter, "The 1925 Master Plan for Tel-Aviv by Patrick Geddes," *Israel Studies*, XIV (2009), 94–119; Noah Hysler Rubin, "The Celebration, Condemnation and Reinterpretation of the Geddes Plan, 1925: The Dynamic Planning History of Tel Aviv," *Urban History*, XV (2012), 114–135.

13 For the liminal position of Manshiya within the urban area of Jaffa and Tel Aviv, see Tali Hatuka and Kallus, "Loose Ends: The Role of Architecture in Constructing Urban Borders in Tel Aviv–Jaffa since the 1920s," *Planning Perspectives*, XXI (2006), 23–44; Deborah S. Bernstein, "South of Tel-Aviv and North of Jaffa—the Frontier Zone of "in Between," in Azaryahu and Troen (eds.), *Tel-Aviv, the First Century*, 115–137; Aleksandrowicz, "The Camouflage of War: Planned Destruction in Jaffa and Tel Aviv, 1948," *Planning Perspectives*, XXXII (2017), 175–198.

use only the Arabic name *Manshiya* when referring to the area of northern Jaffa, reserving the Hebrew name *Neve Shalom* only for the part that had come under the jurisdiction of Tel Aviv in 1921. This turn toward the Arabic name can be seen as evidence of the attempt to confer an "Arab" essence on the area. Jacob Brawer, a prominent Jewish geographer of that time, even called the division between the cities an "ethnographic border," notwithstanding the thousands of Jews still living in "Manshiya." Since the Jews of Manshiya were living on the "other" side of the border line, in a "non-Hebrew" territory, they were not regarded as an integral part of the Hebrew project of Tel Aviv, despite living a few hundred meters from Magen David Square, Tel Aviv's central public space.[14]

The 1948 War and Its Spatial Aftermath The 1948 Arab–Israeli War in Palestine resulted in the flight of almost the entire Arab population of Jaffa. In April 1950, Jaffa's territory was merged into Tel Aviv's municipal area to create the new municipality of "Tel Aviv–Yafo" (*Yafo* being the biblical Hebrew name of Jaffa). Of the 70,000 Arabs living in Jaffa before the war, about 3,000 remained in the united city, becoming a small minority amid more than 250,000 Jewish inhabitants. Even before the new municipality was formed, Israel Rokach, the powerful mayor of Tel Aviv, initiated extensive demolition operations in Manshiya and Old Jaffa as a first step in a massive "urban reconstruction" plan to reshape southern Tel Aviv. Since the original plan was not fully realized, Manshiya and the historical core of Jaffa remained half-demolished and half-occupied until the late 1960s.[15]

During the 1950s, Tel Aviv witnessed a rapid demographic and urban growth, culminating in a population of 393,000 in 1962. The city expanded its municipal boundaries to include 4,242 hectares in 1951, making it a de-facto urban center for three smaller towns to its east (Ramat Gan, Givaatayim, and Bnei Brak). The demographic effect of the 1948 War made the ethnic tensions

14 Aleksandrowicz, "Paper Boundaries"; Bernstein, "South of Tel-Aviv and North of Jaffa."

15 For the aftermath of the 1948 War on the urban area of Jaffa and Tel Aviv, see Arnon Golan, "The Demarcation of Tel Aviv–Jaffa's Municipal Boundaries Following the 1948 War: Political Conflicts and Spatial Outcome," *Planning Perspectives*, X (1995), 383–398; Hatuka and Kallus, "Loose Ends"; Alona Nitzan-Shiftan, "The Architecture of the Hyphen: The Urban Unification of Jaffa and Tel-Aviv as National Metaphor," in Azaryahu and Troen (eds.), *Tel-Aviv, the First Century*, 373–405; Radai, "Jaffa, 1948"; Aleksandrowicz, "Camouflage of War."

between Jaffa and Tel Aviv a matter of the past. The small Arab population that remained in Jaffa was forced to relocate to its southern area (the Ajami neighborhood), while new Jewish immigrants entered confiscated Arab properties in other parts of the city. Yet the spatial distinction between the northern and southern parts of the "united" city did not disappear; they assumed a new guise. The distinction now was not ethno-national, between Arabs and Jews, but socioeconomic, between the well-established population of Tel Aviv's northern neighborhoods and the weakened populations of its southern neighborhoods, including Jaffa. These areas were regarded by the leaders of Tel Aviv as slums subject to massive "reconstruction" schemes.[16]

The central location of Manshiya and its negative reputation made it an almost ideal candidate for large-scale urban reconstruction projects. Starting in 1959, Tel Aviv's Mayor Mordechai Namir promoted the creation of a new central business district (CBD) in Manshiya, announcing an international competition in 1962 and conceiving a preliminary masterplan in 1965. Demolition of Manshiya's buildings resumed during the late 1960s and continued until the early 1980s, erasing almost all of its pre-1948 urban fabric (an area of over 40 hectares). Nevertheless, because proper funding for large-scale construction projects failed to materialize, most of Manshiya's territory remained undeveloped except for a relatively small complex of office buildings; the previously dense urban fabric was transformed into an accidental mixture of main roads, parking lots, and public gardens.

Although Manshiya's reconstruction plans were never realized as intended, other parts of Jaffa underwent a process of limited gentrification, beginning during the mid-1960s in the "artists quarter" in the remains of Jaffa's historical core ("Old Jaffa," as it is termed today) and continuing gradually since the 1980s in the southern Ajami quarter. Nonetheless, Jaffa retained its "otherness" with respect to Tel Aviv, still perceived today as a "mixed" and

16 For the evolving position of Tel Aviv as the main metropolitan center of Jews in Palestine and later in Israel, see Shavit, Biger, and Haim Fireberg, *The History of Tel Aviv: From a City-State to a City in a State (1936–1952)* [in Hebrew] (Tel Aviv, 2007), 26–29; for the growing divide between north and south in the unified Tel Aviv–Yafo municipality after 1950, see Nathan Marom, "Relating a City's History and Geography with Bourdieu: One Hundred Years of Spatial Distinction in Tel Aviv," *International Journal of Urban and Regional Research*, XXXVIII (2014), 1344–1362.

"oriental" city of its own—despite being officially an integral part of Tel Aviv—largely because of its Arab community (fewer than 20,000 inhabitants in a city of 430,000) in several small neighborhoods in Jaffa's southern areas. This spatial distinction between north and south persists, percolating to the towns south of Jaffa (Bat Yam and Holon). It is mostly evident in the socioeconomic differences, which still have a strong spatial component—poorer populations of Tel Aviv's metro area tending to live in the former areas of Jaffa and in the towns to its south.[17]

DIACHRONIC SPATIAL ANALYSIS OF THE URBAN TRANSFORMATIONS IN JAFFA–TEL AVIV A spatial analysis of the effects of Jaffa's 1921 partition on the development of Jaffa's and Tel Aviv's urban area should follow key periods in the gradual urban growth of the cities. This diachronic analysis should trace the transformation or evolution of urban centers, as well as changes in the relative centrality of streets within an entire street network. A comparison of five historical stages covers the main periods of urban expansion and change in Jaffa and Tel Aviv: Jaffa of the late 1870s, at the beginning of its expansion outside the city walls; Jaffa at the beginning of the British mandate, shortly before its partition and the delineation of the border with Tel Aviv; Jaffa and Tel Aviv of the late 1940s, just before the 1948 Arab–Israeli War; the united Tel Aviv–Yafo in 1965, including the towns to its east; and present-day Tel Aviv–Yafo's metro area.

The most reliable cartographical documents available were used to recreate the urban street network in each of the stages: the 1879 map of Jaffa and its environs by Theodor Sandel (scales 1:9100 and 1:31800); a 1918 map of Jaffa by the British Survey of Egypt (scale 1:6000); a 1944 Survey of Palestine maps of Jaffa and Tel Aviv (scale 1:10000); a 1965 Survey of Israel map of Tel Aviv-Yafo, Ramat Gan, Givaatayim, and Bnei Brak (scale 1:10000); and a present-day OpenStreetMap of the Tel Aviv–Yafo metro area. Based on each of these maps, a road-center line map of the street network was produced for the syntactical analysis. An additional

17 For analysis of the current social divide between north and south in Tel Aviv–Yafo, see Daniel Monterescu, "The Bridled Bride of Palestine: Orientalism, Zionism, and the Troubled Urban Imagination," *Identities*, XVI (2009), 643–677; Sharon Rotbard, *White City, Black City* (Cambridge, Mass., 2015).

segment map was created based on the 1944 map; segments cut by the municipal border were divided into two disconnected parts, in a way that simulates the existence of a physical barrier between the cities, mimicking the assumed cognitive effect of the paper boundary.[18]

Centrality is a key concept in space-syntax theory. According to Hillier, "Cities of all kinds, however they begin, seem to evolve into *a foreground network of linked centres at all scales, from a couple of shops and a café through to whole sub-cities, set into a background network of largely residential space* [. . .] wherever you are you are close to a small centre and not far from a much larger one" (Hillier's italics). Unfolding the patterns of this "pervasive centrality," to use Hillier's terminology, can help to decipher the social working of a city.[19]

Space-syntax methodology works with two key concepts of centrality: *integration* and *choice* (also referred to as *potential to movement* and *potential through movement*). *Integration* describes the topological centrality of a given area within an urban network. The higher the integration value assigned to a given space, the better is its accessibility ("to movement") and connectivity within the urban network. *Choice* describes how likely a certain space can become a part of a trip between two points ("through movement") within the urban network. The *integration* and *choice* concepts correspond to two basic elements of any trip—selecting a destination

18 For a detailed description of the method, see Hillier, Tao Yang, and Alasdair Turner, "Normalising Least Angle Choice in Depthmap and How It Opens up New Perspectives on the Global and Local Analysis of City Space," *Journal of Space Syntax*, III (2012), 155–193; for similar application of analysis types in diachronic studies, Işın Can, İrem İnce, and Yamu, "The Rationale Behind Growth Patterns: Socio-Spatial Configuration of Izmir, Turkey 1700s–2010," paper presented at the 10th International Space Syntax Symposium, London, 2015; Itziar Navarro-Amezketa, Mafalda Batista Pacheco, and Teresa Heitor, "Plotting Urban Growth: Fishing Towns in Southern Portugal, 1970–2014," paper presented at the 10th International Space Syntax Symposium, London, 2015; James O'Brien and Griffiths, "Relating Urban Morphologies to Movement Potentials over Time: A Diachronic Study with Space Syntax of Liverpool, UK," paper presented at the 11th International Space Syntax Symposium, Lisbon, 2017.

19 Hillier, "The Genetic Code for Cities: Is It Simpler Than We Think?" in Juval Portugali et al. (eds.), *Complexity Theories of Cities Have Come of Age: An Overview with Implications to Urban Planning and Design* (Berlin, 2012), 129–152. For the concept of centrality in space-syntax theory, see Yamu, "It Is Simply Complex(ity): Modeling and Simulation in the Light of Decision-Making, Emergent Structures and a World of Non-Linearity," *disP—The Planning Review*, L (2014), 43–53; for the term *pervasive centrality*, Hillier, "Spatial Sustainability in Cities: Organic Patterns and Sustainable Forms," paper delivered at the 7th International Space Syntax Symposium, Stockholm, 2009.

from an origin (*integration*) and choosing a route between origin and destination (*choice*). They can thus be used to predict the likelihood of certain urban areas to attract pedestrian or vehicular movement, and thus a myriad of other social activities.

Syntactical maps of integration and choice values were produced for each of the five historical stages using the DepthmapX software. Figure 2 shows the urban centers and main shopping streets of Jaffa and Tel Aviv before 1948, and Table 1 and Figures 3–5 present integration analyses of Jaffa and Tel Aviv during all stages of their development, in a way that correctly reflects historical sources. They reveal how the central core of the urban system gradually shifted from Jaffa's historical core to the northeast due to an asymmetrical urban growth. The historical sources also indicate that already in 1918, Jaffa's historical core was losing its central position to the new commercial hub emerging around Clock Square, along the road to Gaza (today's Yefet Street) and from there extending north into Manshiya and south along King George Boulevard (today's Yerushalayim Boulevard). The shifting of the system's center of gravity to the northeast continued as the urban system expanded during the 1930s and 1940s. In 1944, Tel Aviv's central locations (Magen David Square, the CBD's core) already showed higher integration values than Jaffa's central Clock Square, reflecting the rapid expansion of Tel Aviv in relation to Jaffa's relatively slow development.[20]

After 1948, when Tel Aviv grew to be the linchpin of a metropolitan area, the highest integration values were outside the old centers in Jaffa and Tel Aviv alike, along the eastern extension of the historical Nablus Road (today's Menachem Begin Road), including its northeastern (Jabotinsky Road) and northern (Namir Road) branches. The higher integration values in historical Tel Aviv's central locations relative to those in Jaffa's central locations testify to Jaffa's continuing marginality within the urban system. The disintegrating effect of Manshiya's complete demolition during the 1960s and 1970s made the integration values of Yefet

20 Tasos Varoudis, *Depthmapx Ver. 0.50*, available at http://varoudis.github.io/depthmapX. DepthmapX offers several analytical tools for processing segment maps. In accordance with similar diachronic studies, this study uses high-metric, radius-normalized angular Integration (NAIN) and low-metric, radius-normalized angular Choice (NACH) analyses, which highlight intricate differences at both neighborhood and city level.

Fig. 2 Map Showing Central Urban Locations in pre-1948 Jaffa and Tel Aviv

- **A** Jaffa's historical core
- **B** Jaffa's Clock Square
- **C** The core of Tel Aviv's original settlement from 1909 and today's main central business district
- **D** Tel Aviv's Magen David Square

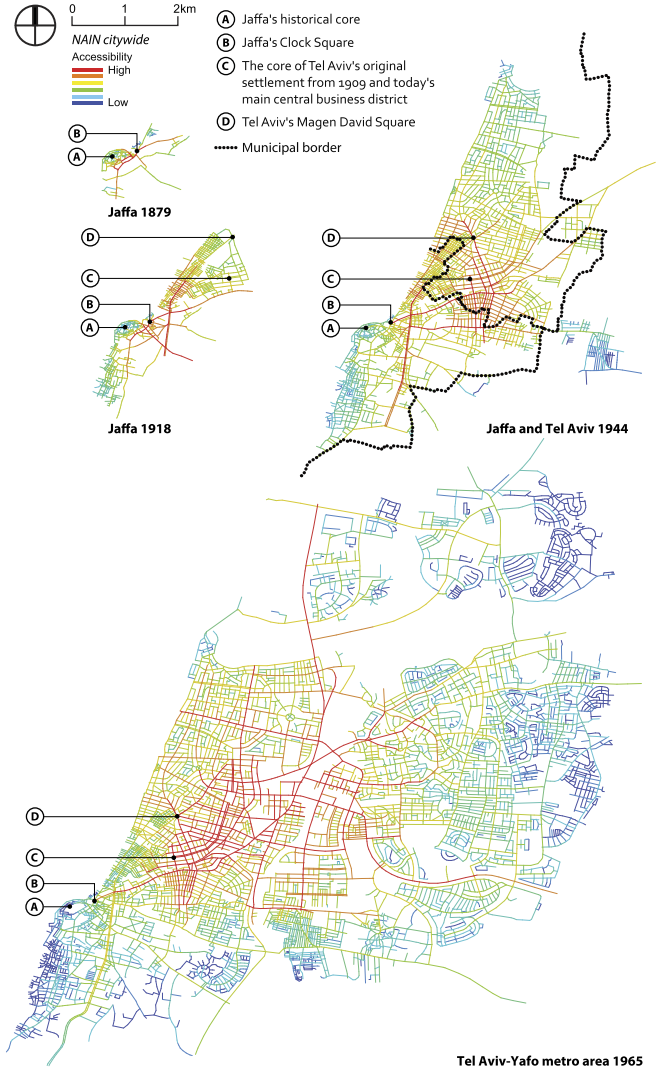
1. The historical road to Gaza, today's Yefet Street
2. Jaffa's King George Boulevard, today's Yerushalayim Boulevard
3. The historical road to Nablus, today's Jaffa-Tel Aviv Road
4. Herzl Street
5. Allenby Street
6. Rothschild Boulevard
7. The historical road to Summeil, today's Hakarmel Street
8. Manshiya's Al-Alim Street, no longer exists
9. Manshiya's main shopping street, Al-Abbas Street, today's HaMered Street

Table 1 Syntactical Measures of Jaffa and Tel Aviv's Central Urban Locations over Time, Integration (NAIN) and Choice (NACH) Analyses

		NAIN						NACH					
	YEAR	1879	1918	1944	1944 SPLIT	1965	2014	1879	1918	1944	1944 SPLIT	1965	2014
	System min.	1.69	2.26	2.77	2.50	2.97	3.19	0.48	0.60	0.70	0.70	0.70	0.70
	System avg.	1.93	2.58	3.05	2.82	3.35	3.49	1.87	2.37	3.00	2.94	3.50	3.39
	System max.	2.11	2.77	3.22	3.03	3.55	3.69	2.81	3.56	4.20	4.20	5.11	4.94
A	Jaffa Historic Core	1.94	2.49	2.96	2.77	3.24	3.46	2.14	2.76	3.41	3.41	3.67	3.82
B	Clock Square	2.09	2.76	3.09	2.92	3.35	3.56	2.05	2.80	4.10	4.12	4.66	4.65
C	Magen David Square	–	2.62	3.16	2.91	3.46	3.62	–	1.98	2.97	2.95	4.17	3.99
D	CBD's core	–	–	3.18	2.99	3.47	3.61	–	–	3.77	3.68	4.56	4.55
1	Yefet Street	2.09	2.72	3.06	2.91	3.33	3.53	1.76	2.34	3.80	3.76	4.45	4.46
2	Yerushalayim Boulevard	–	2.72	3.18	3.00	3.43	3.62	–	1.67	3.51	3.52	4.37	4.30
3	Jaffa-Tel Aviv Road	2.04	2.71	3.21	2.91	3.49	3.65	1.09	1.92	3.32	3.16	4.64	4.11
4	Herzl Street	–	2.65	3.18	2.91	3.47	3.63	–	2.11	3.38	3.22	4.31	4.42
5	Allenby Street	–	2.56	3.20	3.02	3.47	3.62	–	1.67	3.45	3.44	4.40	4.23
6	Rothschild Boulevard	–	2.59	3.14	2.92	3.47	3.62	–	1.68	3.03	3.02	3.96	3.89
7	HaKarmel Street	–	2.59	3.14	2.91	3.41	3.57	–	2.33	3.70	3.12	4.58	4.01
8	Al-Alim Street	–	2.67	3.13	2.83	3.39	–	–	3.14	3.69	3.91	4.49	–
9	Al-Abbas Street	–	2.76	3.19	3.00	3.40	3.51	–	2.98	4.08	3.98	4.98	4.20

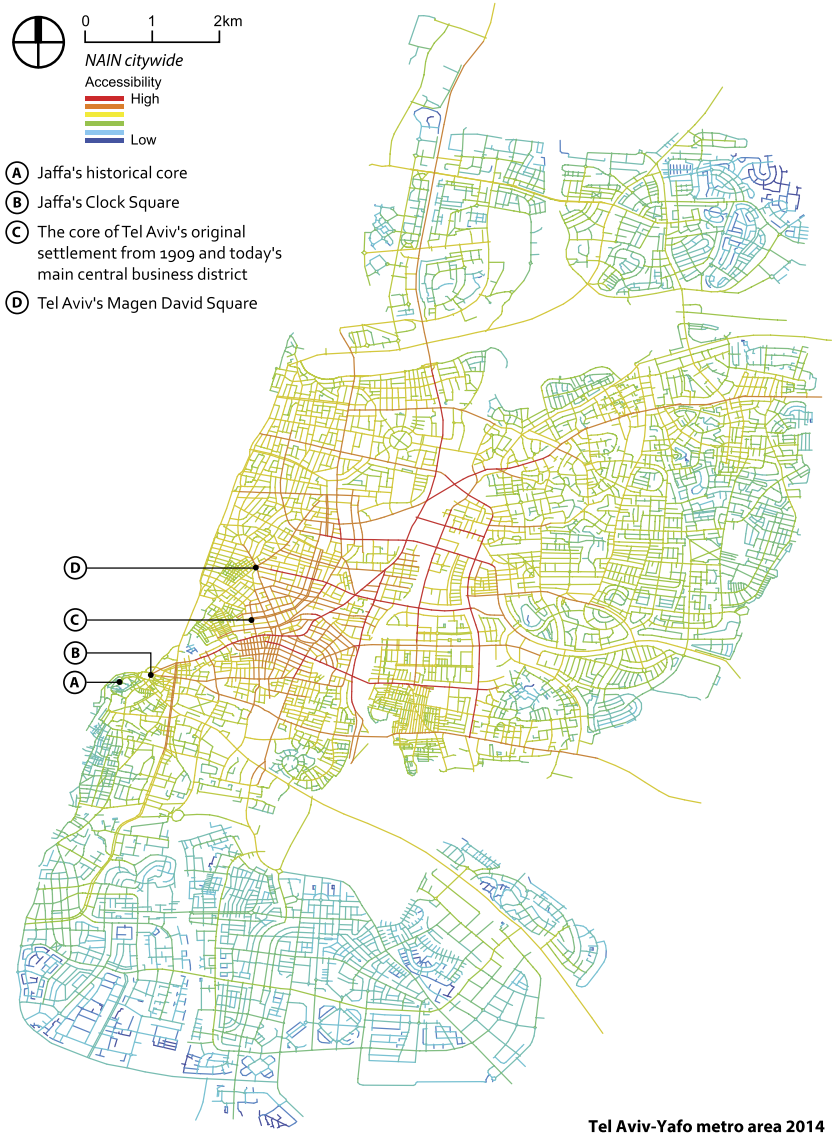
NOTE NAIN stands for normalized angular integration; NACH stands for normalized angular choice.

Fig. 3 Normalized Angular Integration (NAIN) Analyses of Jaffa and Tel Aviv from 1879, 1918, 1944, and 1965—Citywide Analysis (Radius n).



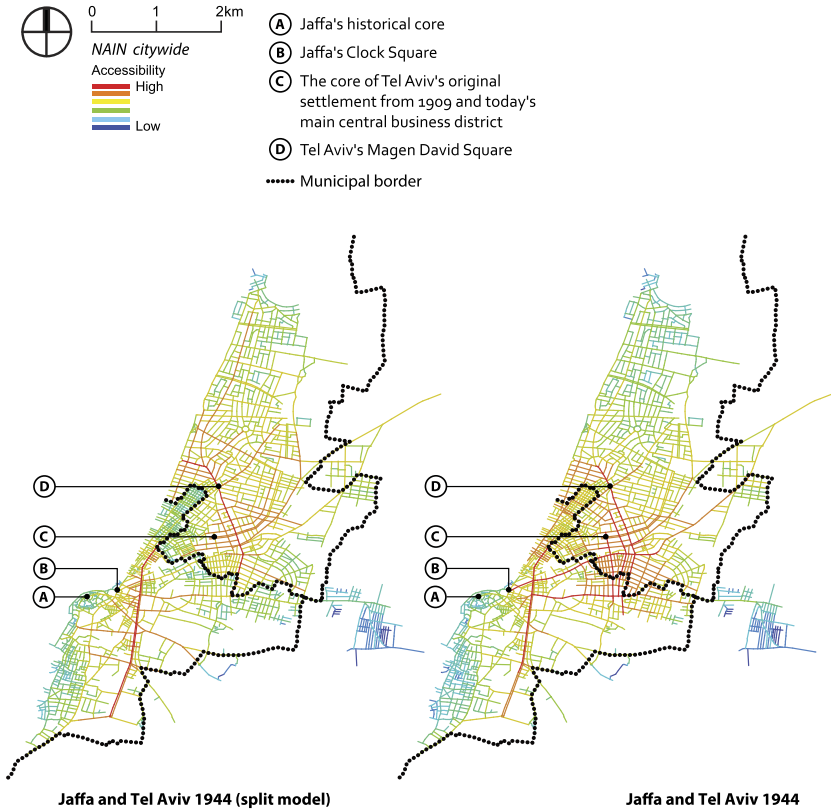
NOTE The 1944 map shows the municipal border between the cities. The term *radius n* applies to a citywide analysis, rather than a local analysis, of a street network, which takes into account a limited metrical radius of analysis (reflecting pedestrian movement). Local values are calculated in order to highlight the intricate differences between areas on the scale of neighbourhoods, whereas citywide values highlight the expected trends on the scale of an entire city.

Fig. 4 Normalized Angular Integration (NAIN) Analysis of Tel Aviv–Yafo Metro Area in 2014, Citywide Analysis (Radius n)



NOTE The term *radius n* applies to a citywide analysis, rather than a local analysis, of a street network, which takes into account a limited metrical radius of analysis (reflecting pedestrian movement). Local values are calculated in order to highlight the intricate differences between areas on the scale of neighbourhoods, whereas citywide values highlight the expected trends on the scale of an entire city.

Fig. 5 Citywide Normalized Angular Integration (NAIN) of the Simulated "Split" Street Network (Left) That Follows the Border between Jaffa and Tel Aviv (1944 map)

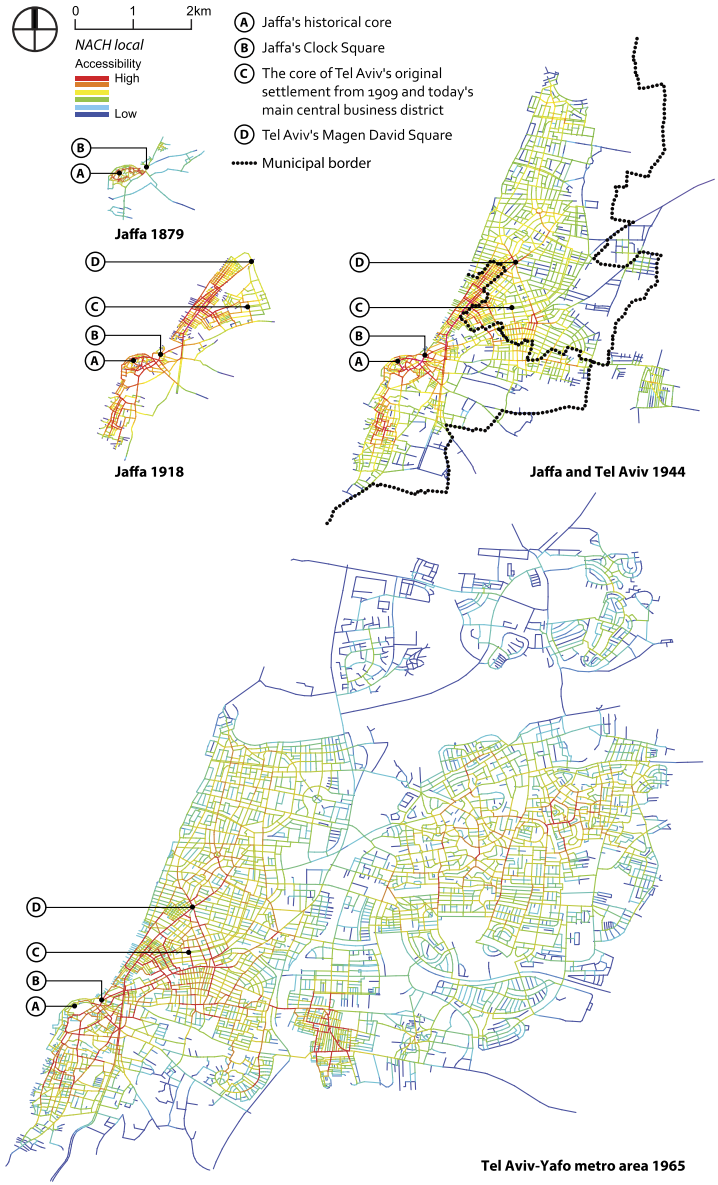


NOTE The unmanipulated 1944 map appears on the right.

Street and Manshiya's Al-Abbas Street (today's HaMered Street) during that period substantially lower than in Tel Aviv's historical main streets.

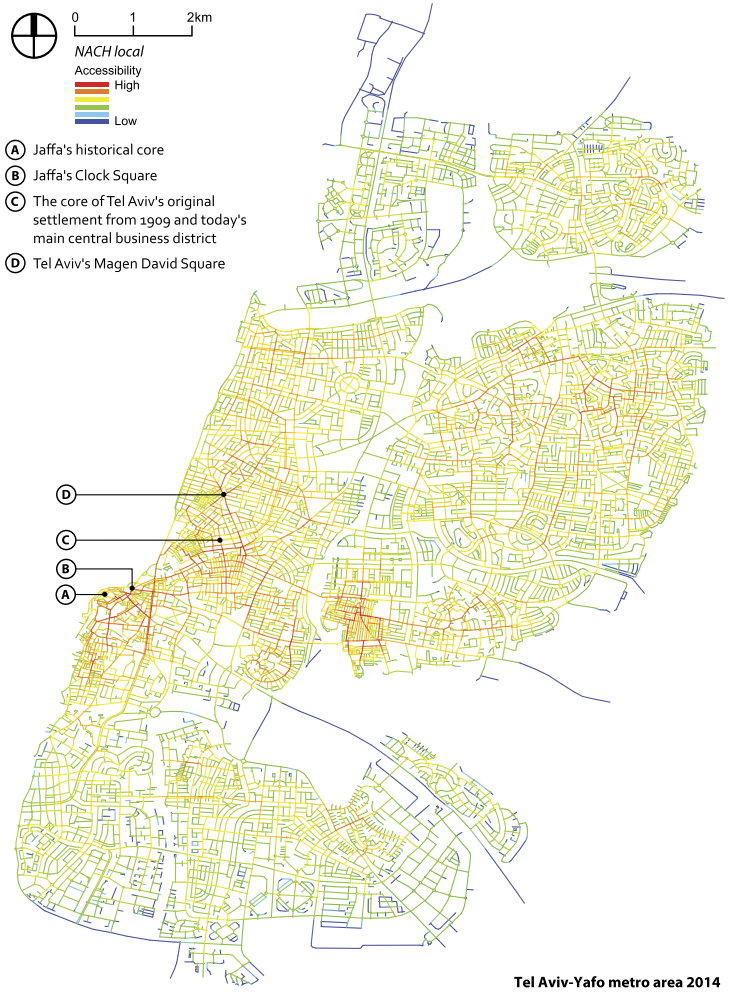
The choice analyses (Figures 6–8, Table 1) show a clear difference in internal cohesion between the urban fabrics of Jaffa and Tel Aviv from the 1940s onward. Jaffa's main streets showed substantially higher choice values than did the main streets of Tel Aviv, reflecting a concentration of Jaffa's commercial activities in a relatively small area. The expansion of Tel Aviv to the north during the 1930s and 1940s did not create a new urban center for the city,

Fig. 6 Normalized Angular Choice (NACH) Analysis of Jaffa and Tel Aviv from 1879, 1918, 1944, and 1965 (Local Analysis with a Low Metrical Radius)



NOTE The 1944 map shows the municipal border between the cities. The local analysis of a street network takes into account a limited metrical radius of analysis (reflecting pedestrian movement).

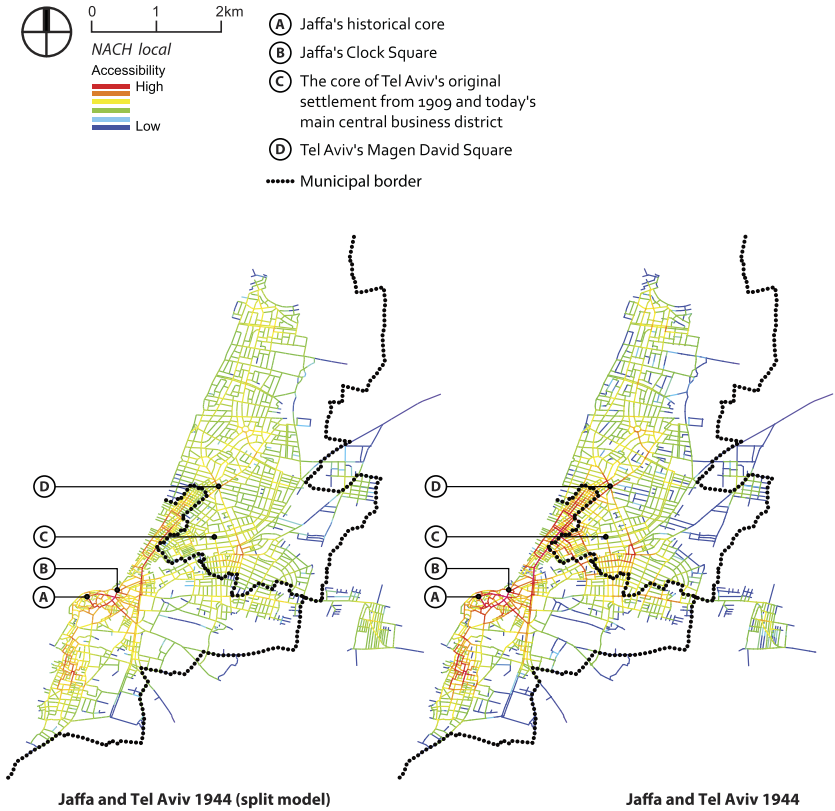
Fig. 7 Normalized Angular Choice (NACH) Analysis of Tel Aviv–Yafo Metro Area from 2014 (Local Analysis with a Low Metrical Radius)



NOTE The local analysis of a street network takes into account a limited metrical radius of analysis (reflecting pedestrian movement).

and its historical downtown area preserved its status, showing the highest choice values in the whole city (though not in the whole urban system). These syntactical findings correspond well to our historical knowledge of urban life in both cities.

Fig. 8 Local Normalized Angular Choice (NACH) Analysis of the Simulated "Split" Street Network (Left) That Follows the Border between Jaffa and Tel Aviv (1944 map)



NOTE The unmanipulated 1944 map appears on the right.

Both the integration and choice analyses underline the importance of Manshiya as a central hub of urban activity from the early twentieth century until its full demolition by the end of the 1970s. Manshiya's main shopping area, Al-Abbas Street, showed substantially higher choice values than all of the other main streets in Jaffa and Tel Aviv until the 1970s; its integration values were also among the highest in both cities. With its extensions to the north (Al-Alim and HaKarmel Streets) and to the south (Yerushalayim Boulevard), Al-Abbas Street was expected to be an attractive linking artery connecting the urban centers of Jaffa (around Clock

Square) and Tel Aviv (around Magen David Square), serving as a backbone for the entire urban system until 1948. Nevertheless, Manshiya never fully reached its spatial potential as a connector between Jaffa's historical core and central Tel Aviv because of the ethnic conflict between Arabs and Jews and the cognitive division created by the 1921 paper boundary. As the historical sources indicate, since the mid-1920s, Jaffa and Tel Aviv have led separate urban lives. Manshiya quickly lost its urban significance, and the movement between the cities through its space substantially diminished as the years went by.

The discrepancy between Manshiya's spatial potential as the most central location in the urban system and its actual marginal urban status is well captured in the simulated "split" model of the 1944 map. Compared to the unmanipulated 1944 map, the integration analysis of the "split" model shows Manshiya's northern "slum" area as a poorly integrated neighborhood; the integration values of Al–Alim and Al-Abbas Streets were substantially lower than in the original 1944 map. Integration values of Tel Aviv's Magen David Square and its historical core were also substantially lower in the "split" model, implying that the ethnic division between the cities also negatively affected the spatial integration of Tel Aviv. Choice analyses of the same maps show almost no differences in values between the main locations and streets of both cities, except for HaKarmel Street, where the choice value is substantially lower in the "split" model. These effects underline Manshiya's potential role as a vital enabler of through movement between the cities, which the historical sources indicate to have gone unrealized since the mid-1920s.

Both the integration and choice analyses clearly show that Manshiya could still have played an important spatial role as a central link between Jaffa and Tel Aviv after 1948: According to the 1965 map, the integration and choice values for Al-Abbas and HaKarmel Streets were the highest among the main streets in both cities. Yet because of the massive demolition in the northern parts of Manshiya during 1948, and the deliberate neglect of its remaining buildings, this connective quality never led to the development of a vibrant urban life around Manshiya's main street, leaving the spatial potential of the neighborhood again unfulfilled.

The complete destruction of Manshiya in later years substantially weakened the spatial continuum from Jaffa's historical core to

Tel Aviv's downtown areas, thus creating a de-facto spatial division between the two city centers. In present-day Tel Aviv, the centrality of Magen David Square, as well as the central business district around the intersection of Rothschild Boulevard with Herzl Street and Allenby Street, is also well represented in its integration and choice values. The location of Tel Aviv's historical core (its central business district) contributes substantially to the strong integration of the nearby Jaffa–Tel Aviv Road within the urban system. Yet spatial analyses of the 2014 map also show that the two historical centers of Jaffa and Tel Aviv are now only loosely connected. A comparison with the 1965 map is striking; it reveals the now-gone spatial importance of Manshiya in stitching the centers of the two cities into a powerful network of interconnections that is no longer viable.

The paper boundary between Jaffa and Tel Aviv existed for less than three decades (1921–1950). During its relatively short existence, a cognitive transformation occurred in the perception of Tel Aviv–Jaffa's urban area: Instead of a single city of mixed ethnic nature, the area underwent a cognitive division into two separate entities, "Jaffa" and "Tel Aviv," representing two separate ethnic groups, Arabs and Jews. The division, although having no physical manifestation at the street level, also changed the perception of Manshiya, from a central hub of urban activity and movement to a marginal, neglected "slum."

Although originally conceived as a "technocratic" tool for urban planning, the paper boundary became a powerful cultural tool for constructing national identities. In that sense, its virtual presence was strong enough to simulate a physical barrier, at least until 1948, as the above spatial analysis demonstrates. The boundary's hold was not diminished even after its official demise in 1950, since Jaffa remained a relatively marginal and self-contained territorial unit within greater Tel Aviv.

Spatial analysis explains how the ethnic and national conflict between Arabs and Jews in British Palestine affected not only the development of Jaffa and Tel Aviv but also the way in which the two communities interacted with and within the urban environment, since the paper boundary undermined the physical unity and the spatial potential of the cities' common street network. This discrepancy between the spatial potential and the actual use of urban space is highly evident in Manshiya, where ethnic hostilities upset its

inherent spatial centrality. Ironically, the eventual destruction of Manshiya created a concrete spatial reality that echoed the earlier, nonphysical separation between the centers of Jaffa and Tel Aviv, contradicting the rationale behind the post-1948 unification of Jaffa and Tel Aviv into a single, Jewish-dominated, city.

The historical case of Jaffa and Tel Aviv demonstrates how prolonged ethnic tensions can break an apparently direct link between a street network and movement flows and thus disrupt the spatial integrity of an urban system. The identification of distinct spatial domains as "Arab" or "Hebrew" in Jaffa–Tel Aviv first took root when the Jewish community founded a spatially segregated neighborhood in Jaffa, eventually to become the core of Tel Aviv as an autonomous city. The establishment of Tel Aviv's municipal status in 1921 solidified the cognitive division between Arabs and Jews with a paper boundary that created a new logic of segregated development in Tel Aviv and Jaffa. After the 1948 War, the "Arab" reputation of Jaffa further prevented its full integration into Tel Aviv, resulting in the neglect or demolition of large areas in its historical core. The differing physical transformation of the two cities echoed long-festering cognitive distinctions.

The analysis presented herein demonstrates that the application of space syntax in studying the history of cities can add a valuable, quantifiable component to the understanding of urban processes. However, it also demonstrates that historical spatio-syntactical analysis can prove misleading when interpreted separately from other types of historical evidence. Space syntax should be used for analyzing past events only when rigorously combined with "conventional" historical research methods. Such a combination can reveal the tensions and interplays between the physical and social forces that shape the life of cities, and it can invigorate our understanding of urban growth and transformation patterns throughout history.