

## **A study on the history of urban morphology in China based on discourse analysis**

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**Abstract.** *Urban morphology is a method widely used in China in the field of urban design and urban conservation. Since its first introduction to the Chinese context about 30 years ago, the key ideas and concepts of urban morphology underwent a significant phenomenon of 'lost in translation'. Different origins of morphological thoughts, different versions of translation, as well as different disciplinary context, have all together led to a chaotic discourse. This paper reviews the key Chinese articles in the field of urban morphology since 1982 and draws out a group of persistent keywords, such as urban form, growth mechanism, evolution and axis that characterize the morphological approach to urban issues, to find unusual evolutionary process. By reviewing the transformation of the definition of these keywords, this paper aims to generate an evolutionary diagram of landmark ideas and concepts.*

*Keywords: Urban morphology, terminology, discourse analysis*

### **Introduction**

Since the late 1970s, China has changed with a rapid urbanization. The development of hundreds of cities has undergone tremendous revolution in the restructuring of the economy and society. In this process, domestic scholars began to pay attention to the phenomenon of the city itself, trying to break through the traditional observation point of view, in order to re-understand the city and establish a new theoretical urban system. At the same time, the theory of urban morphology has been carried out for over 100 years, and initially set up a relatively comprehensive, clear observation mode, and effective analytical methods. Between the study of local urban theory and the application of western theory, 'urban form' came into being. In 1982, Kang Qi, the professor of architecture in Southeast University then, published 'The Form of the City--a Preliminary Study Outline', first proposed 'urban form' concept, marking the domestic scholars on

the formal theory of urban morphology. Over the past 30 years, the urban morphology has gradually become a widely used method in the field of urban design and urban conservation in China, under the constant theoretical research and practical application in a large number of cases.

However, urban morphology characterizes in different school thoughts, different academic origins, and the long history of the development. In addition, factors that domestic research is lagging behind over abroad, and references of the translated versions are selected different, all lead into deviation of its main concepts, study methods, and analysis results. And in the process of localization there has been a confusion of terminology definitions, called 'lost in translation'. When Kang Qi (2011) reviewed urban form in his own theoretical system, he argued that, 'One of my graduate students back from the UK found it that the study of urban morphology has been lasting for a long period in European countries, such

as Italy, Germany, Britain, France and so on, but my research was relatively earlier and continued in China.’ Kang felt surprised about it because he didn’t noticed it before. It shows that domestic development of urban form is originally independent from the European urban morphology, though it gradually interacted by the thoughts of urban morphology then and establishes its framework. Therefore, it is reasonable that some keywords are created in china’s context, some are imported from abroad, and some are mixed together.

### Methodology

It can be seen from relative articles published from the year of 1982 to the present that the study on urban morphology has a lot of branches by multiple methods. This article aims to select some representative pieces among literature, trying to interpret the evolutionary process with local characteristics of the terminology, and summing up the features of the phenomenon.

Regardless of its categories, taking articles using ‘urban morphology’ as keyword from the full-text journal database of CNKI as the basic statistics, the search result comes from 35 journals, reaching a total of 8866 articles.

The Figure 1 clearly shows the trend of the number of articles, which can be divided into three main phases. From 1982 to 1994, the study of urban morphology is still in the initial stage of exploration with a small quantity. From 1994 to 2006, theoretical research experienced a rapid growth period, reaching a relatively high level tenfold over the first phase. After 2006, the number of articles per year is above 500, and the study stays at maturity. The research contents also have different emphasis. The preliminary research focuses on the theoretical analysis, discussing the implication and influenced factors of urban form. Later scholars start to try to interpret the western theory of urban morphology, meanwhile constantly reviews the researches and summarizes the disciplines in domestic theories. In the mature period, ‘urban morphology’ has been regarded as a kind of inherent method to solve problems in city practice and application, combining with other disciplines and technical analysis methods.

The articles come from 30 disciplines, 35 journals, and more than half of which are from 9 authoritative publications. Over 100 authors contribute to the study, and many of them are well-known scholars, such as academicians from Chinese Academy of Engineering, headmasters and professors in architecture school, architects and urban planners. Considering the publishing year, citation times, the author’s authority, the level of the journals and the research categories, this paper selects 32 representative articles as a basic sample, then extracted the key terms related to urban form from each article. These terms are often used frequently with the meaning explained more than one time, which clearly describes phenomenon in the context.

The Figure 3 shows that some of the keywords describe the constituent elements and characteristics of a city, which come from direct observation of the physical elements, such as block, plot, square, plan unit. Those words always have clear and certain definition among most of the articles, but compared with the Western theory, the recognition of its standards is different. For example, the concept of ‘square’ in the ancient Chinese city is relatively weak and insignificant. Square is an adjunctive place always attached to houses or roads, with the combination of traffic, trade, religious function. Square in Western context is much more formal and solemn. It is the occasion to held public speeches and other political campaigns, gathered a large number of religious and monumental architecture. The definition of ‘important places of activity’ has been confirmed already. Therefore, although definitions in the context of Chinese and foreign languages are partly similar, there are differences in the final appearance and function due to the different cultural background.

Another part of the key words is to sum up the reasons behind the urban morphology, trying to conclude characteristics of a sort of phenomenon, such as urban structure, evolution, spatial landscape, expansion. Those terms are often abstract summaries of certain features, or static descriptions of dynamic changes in time and space. Therefore, the definition of such terms is much vaguer

than the first category. The larger scope, incomprehensive and insufficient description, result in misunderstanding of the terms, which needs supplement of other parts of the articles. As for the evolution of the deviation of the word meaning, this paper selected “urban morphology”, “growth mechanism”, “central axis” to explain how the change happens.

## Analysis

### 1. urban morphology

The study of urban morphology is developed along two lines. One is rooted in the Chinese local city, still in the traditional field of urban research with a strong national style, called traditional concept. The other is from the Western theory, by translation and interpretation of the urban morphology and other urban theory or methodology, such as theories of urban functional structure, and typology. It reinterprets the Chinese city by the mature theoretical system which can be called foreign concept. The former one appeared much earlier while the latter one has a far more profound affection. Two lines developed from independently to collectively, explaining the concept of urban morphology from different perspectives.

When Kang Qi (1982) first proposed ‘urban form’, the core idea was that the urban form was inner and variable which means the internal implication of the structure is embodied in the external spatial form, and changes dynamically along with time. At the same time, he argued that the external characteristics of the standard is a superposition of economic, social, natural, science and technology, national, human, psychological, traffic and other elements in a certain period of time. This understanding can be considered as a relatively complete explanation of the concept. Kai Gu (2001) argued that the generalized urban morphology, including the social form and the physical environment, was a discipline under the influence of force for various urban activities (including political, social, economic and planning processes) without emphasizing the intrinsic logic of the city.

Kang Qi (1997) added new viewpoint to the research on the basis of the original study, not only emphasizing the inherent form, but also increasing the material and spiritual connotation on it. Meanwhile he put forward to the concept of ‘cultural factor’, and considered that the cultural factors from the historical events, social change, revolutionary resort will eventually affect the city itself. But this view was removed from the article in 2011, only reserving the concept in 1982.

Except for study of Kang Qi, in some other articles, urban morphology was regarded as a one-sided concept that consists partly of the structure, form, type or urban tissue in a city, often confused with the concept of layout. Instead of giving the urban form a definition, Liangyong Wu (1984) initiated the method of defining the city form with a general idea from several aspects, such as cityscape, layout, structure and so on. The “city form” refers to a series of urban components, such as walls, regional districts, businesses, sites. ‘Style’ in Chinese writing has two parts, in which the first character indicates local and traditional, and the other refers to the condition of the subject. The meaning of the style is too broad, often used to describe nature or custom. The ‘layout’ focuses on the relative location of different physical elements. The emphasis is on the feature of a city’s structure, not enough to represent the overall meaning of a city’s urban form.

As for the interpretation of Western theory, the definition of urban morphology has a certain common comprehension that different schools have different understanding. Two kinds of theories interact a lot in terminology, gradually reaching a consensus that the definition should be divided into broad and narrow sense. Besides Kai Gu (2001), Cui Zheng (2002) also believed that the general meaning of urban morphology refers not only to the urban parts of the tangible performance and geometric condition, but also a complex economic, cultural phenomena and social process, which is the result of interacting human activities and natural factors in a specific geographical environment and certain social and economic development. All of these definitions are influenced deeply by the study of Kang Qi, promoting its theory and

the construction of the theoretical framework. Figure 4 is drawn by the number of references cited in Kang Qi, Kai Gu and Liangyong Wu. Three of them are the famous scholars in domestic urban theory research, but only citation of Kang Qi and Kai Gu's articles gradually increase during the period. It illustrates that the development is doomed to choose a more mature, perfect theoretical framework, and eliminate one-sided, vague thoughts.

## 2.growth mechanism

Growth mechanism is an original term in domestic research. It dates back early in time has a break in relative study. It origins in the meaning of internal implication (Kang Qi, 1982). Liu Qinghao (1995) cited Qi Kang's definition of urban form at the beginning of the studying growth mechanism, emphasizing that the connotation of "logic" and the extension of "performance" constitute the overall view of urban morphology together. Zhang Yuxing (1995) proposed that the growth mechanism is an important part urban morphology. He thinks that it embodies the dynamic growth of the form of self-dissipation and self-regulation, reflecting space, time, and human, which is the three most significant elements.

The growth mechanism essentially explores the inherent logic behind the changes in urban morphology. However, the logic behind comprises a complex theoretical system as well, composed of a mixture of factors together, and presenting differently. In this point, as a secondary category of urban morphology, the meaning of growth mechanism is great wider and more difficult to clarify than 'neighborhood', 'plot' and other physical features.

"Growth" refers to accretion and expansion from the center growing spot. There are three general situations: urban extension, land replacement, and city growth ring. Its growth pattern is divided into morphological growth and regional growth. The former is characterized by the type conversion, while the latter includes the expansion and transformation, generating 10 kinds of growth patterns.

Growth mechanism can not only be divided

by performance and patterns, but also reflect the different stages of the urban morphology evolution process. When Cui Zheng (2002) concluded "the growth" according to articles from 1990, she suggested that 'there is confliction of the old form and the new function, and then the old form gradually collapses while the new growth spot from the original form are free out ... .. the new form develops to replace the old one and related adaptively to the new function. The evolution of the urban form is a dynamic process between accomplishment and adjustment.' Therefore, 'evolution' can be regarded as the ultimate consequence of growth mechanism, which is the appearance for the growth mechanism under the combined action of many factors.

According to the tendency of four terms, as the rapid growth of articles, the study of growth mechanism is further less than other words. Considering the reasons behind it, due to the excessive dimension of growth mechanism, it has not yet formed a unified definition and classification standard in the Chinese context, and it is not good as 'evolution' on reflecting the changes with time. It is gradually replaced by its various factors. However, the connotation of this term does not disappear, on the contrary, after breaking down into multiple terms, more accurate and detailed explanations of the principle exist in another form of the study.

## 3.central axis

Central axis is one of the important standards in the traditional urban research methods and design planning in china. The description is always accompanied by directions. Sicheng Liang promoted in 'History of Chinese Architecture' that those axis among China's ancient large buildings in the plane controlling the whole area are known as "central axis", and pointed out that it is only stressed mostly in China than any other countries in the world and has a prominent achievement. Liangyong Wu (1993) suggests in the plan of western district of Beijing that, designers should take good advantage of traditional method that first determine the central axis. For example, the plan should spread the axis northwards to the Fuhai lake in Yuanmingyuan Garden, southwards to Fengtai block, centered in



Yuyuantan Park, and with ancient city and industrial zone on the both sides, green belt in the middle. Bochong Chen (1992) studies Fuzhou as another example. The design that building up a concrete high-rise building in the central axis among three great mountains severely damaged the layout of historic city. In the traditional sense, central axis is a sequence of nature, landscape, and architectural features. There is not only symmetrical residential distribution on this line, but also natural form of peaks, lakes, as well as palaces, temples and other landmarks. All elements can be regarded as a series of points, and central axis is the logic arrangement of the set of points under certain rules. This design principle reflects that the order in the traditional urban design occupies an important position.

Later the term of 'axis' occurs then as western theoretical research translated into domestic study. The axis is no longer central, iconic, political, and emphasizing on obvious belt area. Yuxing Zhang (1995) analyzed the axis along the river in Nanjing, and finally concluded that this area will form a new urban landscape belt. Chunlan Du (1998) mentioned Paris city developed along the Seine River axis. And Zhuojun Zou (2003) analyzed city of Hangzhou, considered that banded development close to natural green space which can create a good environmental condition, but if the belt city axis is too long, a series of urban problems will follow. Once axis means a region, it is no longer a straight-line shape. As long as it can indicate that the area is different from the surrounding environment, axis can also refer to the bending area, such as the river bank.

After that, the characteristics of the axis are further diluted. Jie Zhang (2003) mentioned in the large-scale urban design that the 20km long urban road axis lacks the perception of actual space and time. Jiantao Zhang (2004) described a road in the urban regional planning. The urban street network is irregular, when land along the road expands to both sides, strengthening the road axis. In the two cases, 'Axis' only retains the meaning of the line. What it corresponds is more figurative, and more refers to a physical element with linear features, such as roads.

The evolution of the 'central axis' experienced deflecting. It is born in traditional design techniques, grows out large-scale city, and formulate a clear reference in modern design. The connotation simplified while the application is more extensive.

## Conclusion

Urban morphology, growth mechanism and central axis represent three cases of evolution: fusion, separation and deflection. In addition, there are many other situations, such as substitution, combination, borrowing and so on. Figure 6 presents the evolution of key words.

The occurrence of 'lost in translation' in the research field of urban morphology, partly leads to a temporary misunderstanding of comprehension, but this phenomenon is not entirely negative and disordered. Although the domestic study only develops for a short period, the introduction of foreign theories and methods has accelerated this process, which has improved the depth and breadth of research in recent years. A large number of literature studies have formed a simple selecting model that retains the effective, precise, and popular concept, and meanwhile eliminates ambiguous, demise, obscure parts. The terms of the different sources are continually integrated, while some of which have been solidified by evolution, and some are cross-colliding in a variety of understandings to achieve precise levels and possibly create even new terms.

The meaning of the term is not static, even if the 'solidified concept' is also a 'temporary definition'. As the research discusses new observation, every term with certain meaning can be changeable to refer to new concepts. At the same time, with the paces of city development, new models, influencing factors and analytical techniques are needed in the study. Conceptual improvements or new vocabularies are inevitably generated. Thus, any term is likely to undergo a process of 'changeable - certain - changeable'. In the terms of the view, the phenomenon of terms evolution will be existing for a long time.

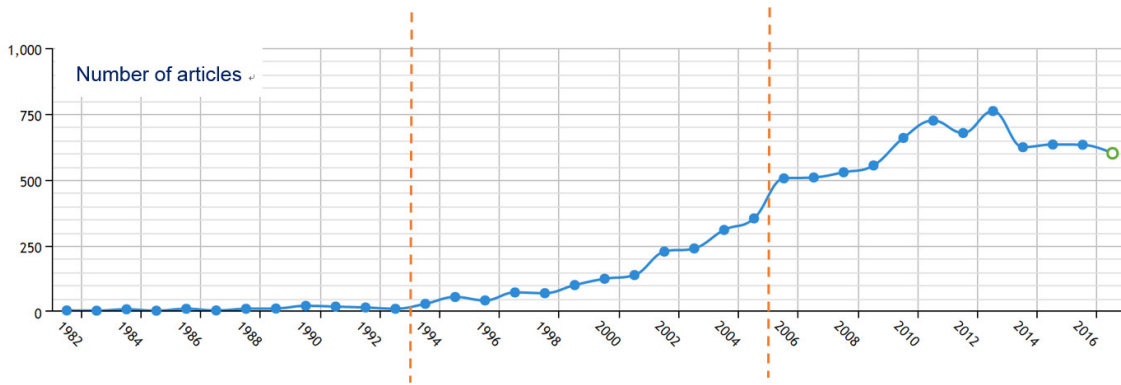


Figure 1. Articles using ‘urban morphology’ as keyword per year(www.cnki.net)

No.	Title	Author	Journal	Publication Time	Citation
1	The Form of the City--a Preliminary Study Outline	Kang Qi	City Planning Review	1982/12/27	103
2	The Layout Structure of Historic and Cultural City	Liangyong Wu	Architectural Journal	1984/1/31	18
3	The Propagation of Urban Physical Environment and Cultural Connotation	Bingren Xiang	Architectural Journal	1988/11/26	2
4	Study on the Typology of Architecture	Chunyu Wei	Huazhong Architecture	1990/7/2	93
5	A Summary of City, Architecture and Space Structure	Bochong Chen	New Architecture	1992/12/30	2
6	"Landscape City" and China's Urban Development in the 21st Century	Liangyong Wu	Architectural Journal	1993/6/30	97
7	Study on the Historical Characteristics and Evolvement of Changshu City	Jianguo Wang	Journal of Southeast University	1994/11/20	60
8	Ecological Mechanism of Urban Form	Qinghao Liu	City Planning Review	1995/3/9	154
9	The Elements and Processes of Urban Morphological Growth	Yuxing Zhang	New Architecture	1995/11/22	37
10	Retrospect and Prospect of Research on Urban Fringe Belt	Jianming Zhang	Human Geography	1997/9/30	180
11	Context and Characteristics--Cultural Characteristics of Urban Form	Kang Qi	Urban Development Studies	1997/1/23	126
12	Study on Regional Characteristics and Urban Morphology	Chunlan Du	Journal of Civil,Architectural & Environmental Engineering	1998/6/30	80
13	Study on the Formation and Form of the Fringe-belt City	Xi Wu, Hongjie Wu	Huazhong Architecture	2000/12/20	17
14	The Theory and Method of Urban Morphology-- Exploring the Framework of Comprehensive and Rational Research	Kai Gu	City Planning Review	2001/12/9	319
15	Review of Research on Urban Morphology in China since 1990	Cui Zheng, Lin Lin	City Planning Review	2002/7/9	352
16	Urban Morphology Research and Spatial Strategic Planning	Jin Duan	City Planning Review	2003/2/9	159
17	Discussion on the Evolution of Urban Morphology and the Dynamic Relationship Between Urban Water Systems	Zhuojun Zou, Jianjun Yang	Planners	2003/2/25	63
18	Study on the Chinese Traditional Urban Space Form from the View of the Theoretical Standard of Urban Form	Yigang Zhou, Yue Yuan	New Architecture	2003/12/10	27
19	From Large-scale City Design to the Daily Life Space	Jie Zhang, Jie Lv	City Planning Review	2003/9/9	176
20	The Application of Urban Morphology Theory in the Planning of Historical Scenery Reserve	Jiantao Zhang	Urban Planning Forum	2004/11/20	52
21	Theoretical Construction and Methods of Urban Land-use Patterns	Lian Duan, Yulong Liu	Urban Development Studies	2006/3/26	8
22	The Basic Summary of the Evolution of Chinese Urban Morphology since the 1990s	Guoping Qiong, Dongfeng Yang, Jianxun Yu	Huazhong Architecture	2010/4/25	15
23	Application of Urban Morphology in the Renewal of Urban Marginal Area	Cong Guo, Tongtong Liu, Yuan Zhan, Delong Sun	South Architecture	2010/2/28	0
24	A new Research Framework -- the Application of Urban Morphological Typology in China	Fei Chen	Architectural Journal	2010/4/20	42
25	The Form of the City	Kang Qi	Modern Urban Research	2011/5/15	20
26	Study on the Relationship between Urban Morphology and Urban Microclimate	Wowo Ding, Youpei Hu, Pingping Dou	Architectural Journal	2012/7/20	61
27	The Dilemma and Solution of Conzenian Urban Morphological Regionalization Theory in China	Sheng Yao, Jintang Chen, Yinsheng Tian	Urban Development Studies	2013/3/26	7
28	The Development and Thinking of Conzenian Urban Morphology Theory in China	Ying Zhou, Yinsheng Tian, Kai Wei	Proceedings of 2013 China Urban Planning Conference	2013/11/16	0
29	A Review of Chinese Urban Morphology in 2003-2013 Years	Huifang Wang, Kai Zhou	Progress in Geography	2014/5/15	30
30	Experiences From Researches About Residential Areas Employing Conzenian Approach	Jintang Chen, Sheng Yao, Yinsheng Tian	Urban Development Studies	2014/2/26	2
31	Distinguishing Characteristics , Exploring Principles of Regional Urban forms: The case of Chengdu and Chongqing	Xu Li, Yue Che, Hanmei Zeng	City Planning Review	2015/5/25	2
32	Use The Urban Morphology Theory Of Krier To Explain The New Cities And Towns Development In China	Gengnan Wei, Kang Qi	Architecture & Culture	2016/7/15	0

Figure 2. Information of articles selected as sample

No.	Urban Morphology	layout	urban tissue	cityscape	urban structure	growth mechanism	organic	evolution	urban fringe belt	neighbour	block	plot	central axis	typology	square	landscape city	Other keywords
1	Urban Form	layout								neighbour							Natural force
2	Urban Form	layout				growth							central				human force
3	Urban Form									neighbour					square		townscape
4	Urban Form						organic	evolution							square		surrounding
5	Urban Form			cityscape				evolution			block		central axis	typology	square		behavior
6		layout									block				square	landscape city	model
7	Urban Form	layout								neighbour						landscape city	urban
8	Urban Form	layout					organic	evolution					central axis				language
9	Urban Morphology		urban tissue														form and
10	Urban Morphology																function
11	Urban Form	layout	urban tissue						urban fringe belt								urban space
12	Urban Form	layout	urban tissue	cityscape			organic			neighbour							landmark
13	Urban Morphology								urban fringe belt								
14	Urban Morphology	layout	urban tissue														
15	Urban Morphology	layout	urban tissue					evolution		neighbour			central axis				cultural landscape
16	Urban Morphology	layout		cityscape							block	plot	central axis				expansion
17	Urban Morphology	layout					organic										accretion
18	Urban Morphology	layout	urban tissue				organic	evolution			block						morphologica
19	Urban Morphology	layout	urban tissue				organism	evolution									l-genetic
20	Urban Morphology	layout		cityscape													shape
21	Urban Morphology	layout		cityscape					urban fringe belt								urban size
22	Urban Morphology	layout				growth			urban fringe belt								mutual
23	Urban Morphology	layout	urban tissue					evolution	urban fringe belt								adaptation
24	Urban Morphology	layout	urban tissue						urban fringe belt								function
25	Urban Morphology	layout								neighbour							strategic
26	Urban Morphology	layout	urban tissue														planning
27	Urban Morphology	layout															river system
28	Urban Morphology	layout															point
29	Urban Morphology	layout															line
30	Urban Morphology	layout															plane
31	Urban Morphology	layout															
32	Urban Morphology	layout		cityscape		growth											

Figure 3. Key terms in sample articles (Number is the same as Figure 2)

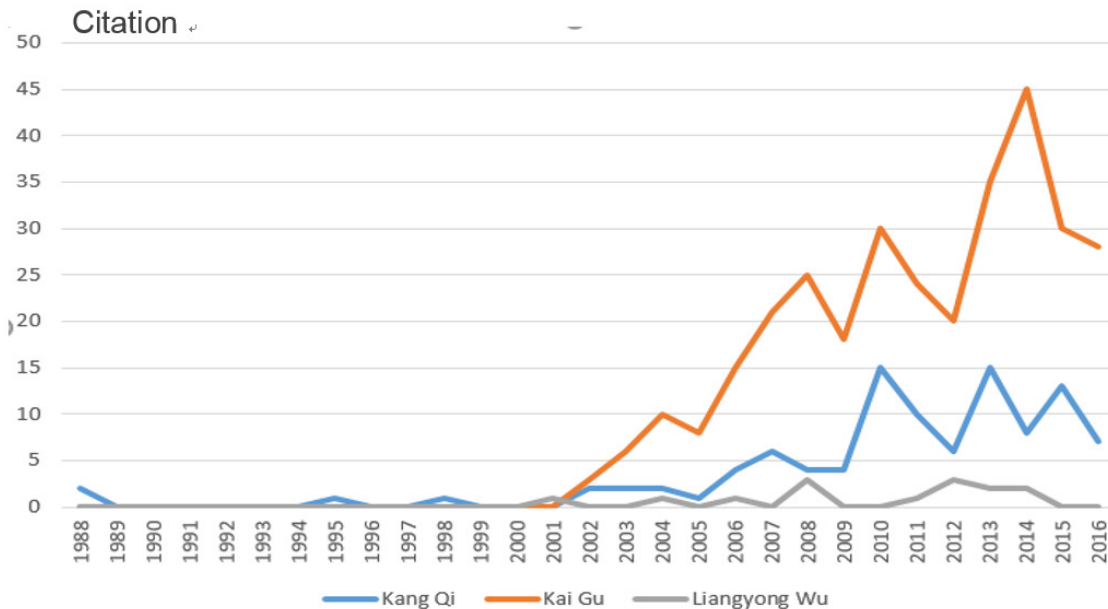


Figure 4. Citation of three well-known scholars' articles

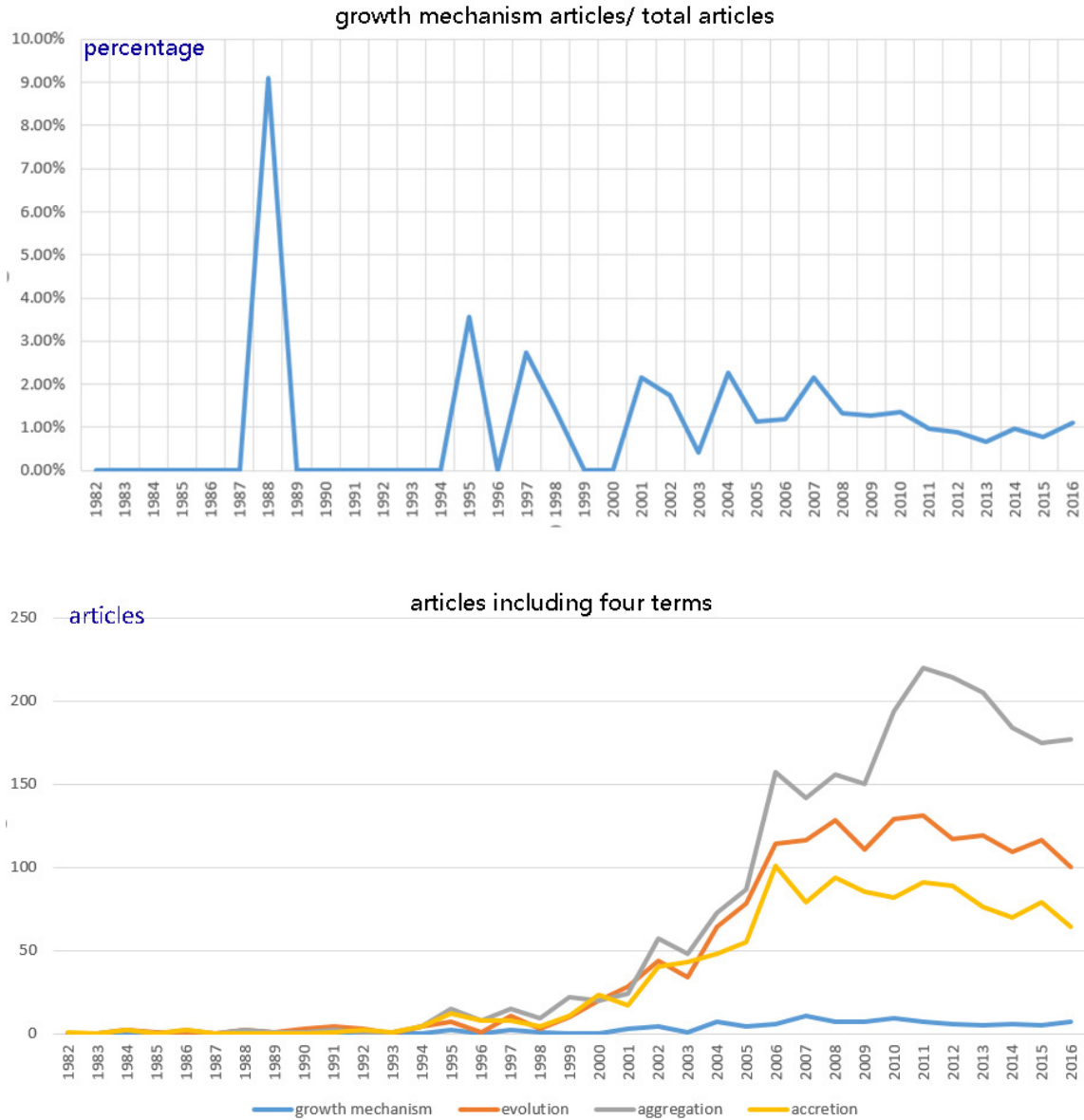


Figure 5. Development tendency of 'growth mechanism'



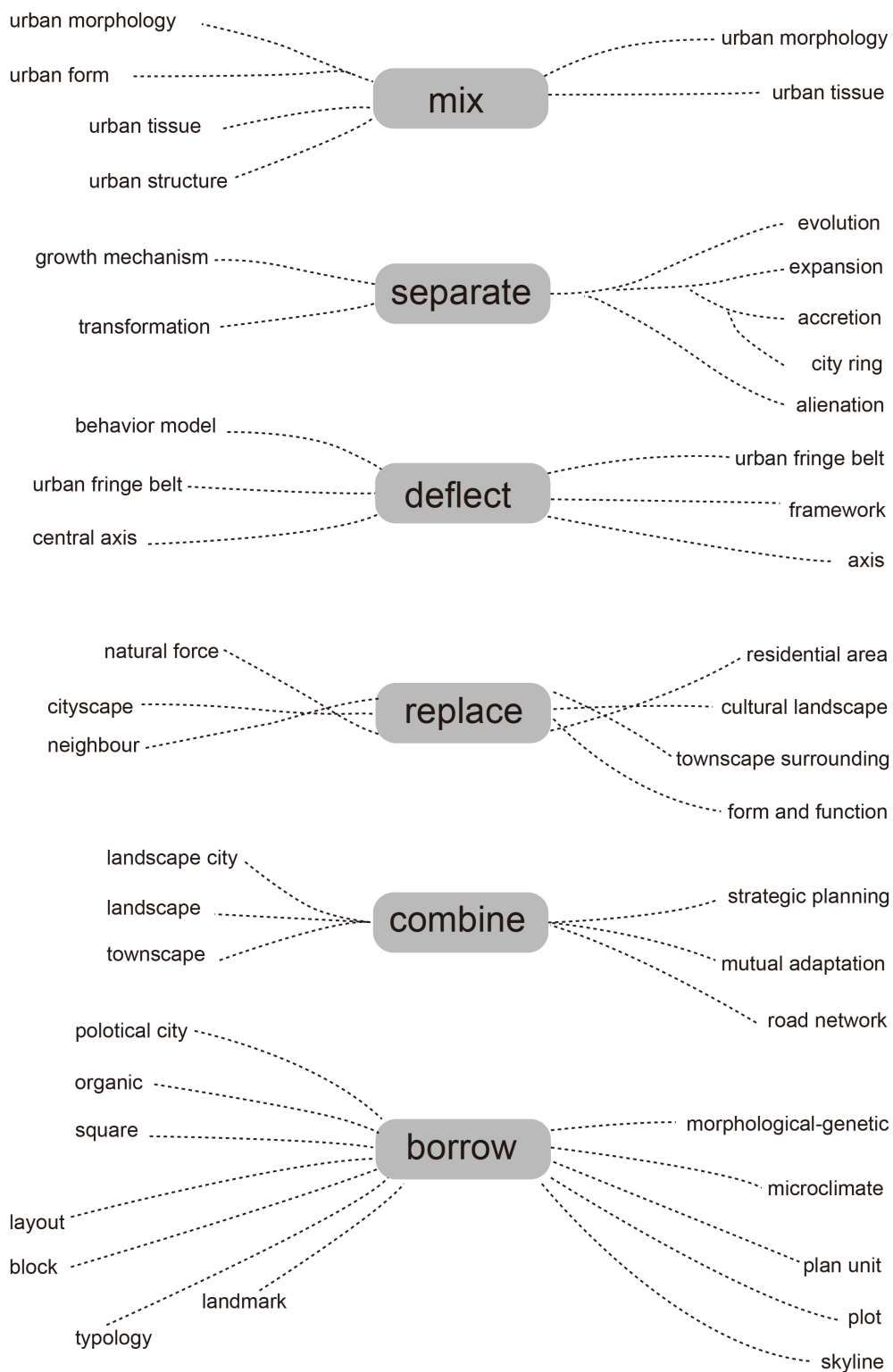


Figure 6. Diagram of key terms evolution

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