

Evaluation on well-being and urban development: A case study on 33 cities of mainland China

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Abstract

With the achievement of prosperity in all respects, what China now faces is the contradiction between unbalanced and inadequate development and the people's ever-growing needs for a better life. The focus of the governance changes from increase GDP and accelerate urban construction to improve people's well-being. There is no doubt that improving the urban development environment based on meeting the various needs of residents is closely related to people's well-being. Therefore, we summarized the cognition of well-being in both Chinese traditional and contemporary aspects to ensure that the follow-up research is applicable to the local situation in China. After building an evaluation index of well-being based on the Happiness Sphere, time geography and Maslow Demand, the data of 33 cities were applied and we specifically analysed key cities like Beijing and Hangzhou. The conclusion concentrated on a summary of well-being features and a discussion of both advantages and disadvantages of the urban development environment. We could see that each city has different strengths and weaknesses. What needs to be illustrated is that the high accessibility and operability of the statistical data and big data provides a clear perspective for researchers and practitioners in other countries undergoing society transition.

Keywords

well-being, urban development, measurement, well-being index, Chinese perspective, cities

1. Introduction

Over the past 40 years, the social economy of China has achieved leapfrog development and the urbanization level has been continuously improved. According to the seventh national census, the urbanization rate has reached 63.89%, which means China has entered the urban era. With the achievement of prosperity in all respects, what we now face is the contradiction between unbalanced and inadequate development and the people's ever-growing needs for a better life. The focus of the governance changes from increase GDP and accelerate urban construction to improve people's well-being. There is no doubt that improving the urban development environment based on meeting the various needs of residents is closely related to people's well-being.

Since its beginnings in the 1930s, the science of well-being has developed into one of the most active research topics in psychological science today. The personality tradition of well-being research suggests that well-being can be reliably measured. The social psychology tradition has clarified that 'well-being' has multiple cultural meanings, that well-being is often experienced in relational contexts, and that it is possible to improve one's well-being. Since the earliest introduction of Gross National Happiness (GNH) in Bhutan in the 1970s, a happiness orientation has gradually become the governing consensus worldwide. A number of organisations and countries, including the United Nations and the OECD, have been actively exploring it. For China, the core concept of 'people-centred' has made the simultaneous promotion of

people's happiness and urban development an important task for local governments at this stage. Furthermore, it is hoped that evaluation of well-being on the national or city level could lead to policies that enhance the engagement, joy, trust, and affection of ordinary citizens who are without subsistence allowance or other problems.

Therefore, based on the Happiness Sphere Theory, time geography and Maslow Demand Theory, the study built a happiness evaluation system with 3 spheres which included 50 index items. Before the index was built, we summarized the cognition of well-being in Chinese traditional culture and the concerns of contemporary Chinese to ensure that the follow-up research is applicable to the local situation in China. Then the study analysed the difference between east China and west China through the nationwide questionnaire survey. What's more, the study applied the data of 33 cities in China to the evaluation system to make a preliminary analysis and demonstrated the future application possibilities.

The conclusion concentrated on a summary of well-being features and a discussion of both advantages and disadvantages of the urban development environment. In addition, we conducted a specific analysis of key cities like Beijing and Hangzhou and so on. Each city responds to the needs of its residents in its own way. The results of this index measurement will not only provide feedback on the development of the city, but will also help to indicate the direction in which the city can improve the well-being of its residents.

2. Cognition of Well-being in the Chinese Context

2.1. Individual and societal well-Being

Personality and social psychologists have made remarkable dedications on evaluation and factors of well-being. Numerous attempts and contributions have been made by personality and social psychology to the measurements of well-being respectively and together. On the one hand, the personality tradition of well-being research has consistently concerned about construct and measurements of well-being, which is proved that it is possible to be done reliably (D. T. Campbell & Fiske, 1959; Cattell, 1943; Cronbach, & Meehl, 1955; Diener et al., 1985; D. Watson et al., 1988). Earlier evaluations of well-being have indicated that self-reported feelings and status related closely to life outcomes. Also, genetic factors are considered to have a greater influence under the traditional latent trait view (Lykken and Tellegen, 1996; Tellegen et al., 1988). On the other hand, social psychologists have questioned the basic well-being judgments and assumptions proposed by personality psychologists and showed the influence of extraneous conditions on well-being judgments (e.g., Schwarz & Strack, 1999). They have illustrated that "well-being" diverse meaning by cultural (Kitayama & Markus, 2000). Although the life events have short-term effects on happiness (Wilson & Gilbert, 2008), it could be improved with experiencing well in society or relationship context (Hsee et al., 2008; Lyubomirsky et al., 2006).

There is no doubt that, happiness is one of the most important and most popular life goals all over the world (Oishi S., 2012). Moreover, human welfare is one of the primary goals of social psychology (Lewin, 1948; Snyder, 1993). However, compared with its meaning, attention to societal well-being, or integration of personality and societal well-being, has received low attention so far. To identify and estimate the level of "happy" society could not simply be measured as the summation of self-reported well-being. A well-functioning society is related to many aspects and some of them could not attribute to any individuals (Durkheim, 1897/1951). Thus, the integrations of both personality and societal approaches could be seen by the recent research on correlational and experimental methods (e.g., Lucas & Baird, 2004; Tamir, 2005). The integration of methodology also described the person-situation interactions (Crocker et al., 2002; Diener et al., 1984).

Considering that the evaluation of well-being and urban development is a macro-scale application, societal well-being or integrated methodology is more suitable. The integration of political science,

economics, sociology, psychology and other disciplines will help to further explain the complexity of happiness, which is beneficial to the follow-up well-being improvement policy.

2.2. Cultural continuity and unique nature of well-being in contemporary Chinese context

In addition to the measurement of well-being, many researchers investigated the cross-cultural equivalence of measurement (eg., Oishi, 2010) and the relational and cultural context of well-being (eg., Kitayama & Markus, 2000). It has been proved that cultural differences are suitable for explaining the important differences in response patterns of "well-being" between different countries (Vittersø et al., 2005). Therefore, exploring the connotation of well-being in the context of Chinese culture is of great significance to the follow-up evaluation work.

From the perspective of Chinese traditional culture, the earliest documentary record on happiness can be traced back to "Shangshu•Hongfan" in the 6th century BC. It could be found that ancient Chinese believed that happiness consists of five dimensions: health, longevity, wealth, tranquility, and noble morals. Also, Confucianism, Taoism and other thoughts have influenced people's pursuit of ideal life. On the mundane aspect, the theme deriving from Confucian philosophy taught that truly meaningful existence is conceivable only to benefit the people and serve the country. On the transcendent aspect, Taoism values the harmony between man and nature. The respect for life and the yearning for freedom has formed a profound influence. The above-mentioned traditional Chinese culture has had varying degrees of influence on the people's outlook of happiness in today's society, which has formed a unique value system for Chinese people to perceive happiness. This includes a longing for inner peace, emphasizing family bonds or family interests, respecting personal strive and social benefits, and pursuing the combination of interpersonal harmony and natural harmony. It could be said that the traditional Chinese view of happiness is imaginative and empathetic. It is not only limited to oneself but emphasizes great harmony.

From the survey and research results of contemporary Chinese, it could be found that people pay more attention to the following ten points: good health, income satisfaction, being with family, getting love, owning personal housing, realizing self-worth, eating safe food, good living environment, social security, and having trusted friends. It is worth mentioning that under the influence of East Asian culture, Chinese people pay more attention to family (or marriage) and self-realization than in the West. Corresponding to the Good Life factors report of GfK, unlike other countries, Chinese people rank "happy marriage" in third place, which is more important than "leisure time" and "vacation". Oishi (2006) proposed that Chinese concept of life satisfaction is based primarily on external conditions and the current status rather than past accomplishments. In addition, in a self-critical society like China, self-improvement is highly valued, because past achievements may not guarantee satisfaction as the standards continue to rise.

Table 1 Factors for a good life- top 5 factors per country

Rank		1	2	3	4	5
Country						
Europe	Belgium	Good health	Financial security	Free time/ leisure time	A home you own	A happy marriage
	France	Good health	Financial security	Free time/ leisure time	Travel for leisure	A home you own
	Germany	Good health	Financial security	Free time/ leisure time	A happy marriage	Control over one's own life
	Italy	Good health	Financial security	Free time/ leisure time	Free time/ leisure time	A happy marriage
	Netherlands	Good health	Financial security	Free time/ leisure time	Travel for leisure	A happy marriage
	Russia	Good health	Financial security	Free time/ leisure time	A happy marriage	A job that is interesting
	Spain	Good health	Financial security	Free time/ leisure time	Travel for leisure	A happy marriage
	UK	Good health	Financial security	Free time/ leisure time	A home you own	A happy marriage
North America	Canada	Good health	Financial security	Free time/ leisure time	Travel for leisure	A home you own
	USA	Good health	Financial security	Free time/ leisure time	A happy marriage	A home you own
Latin America	Argentina	Good health	Financial security	Travel for leisure	Free time/ leisure time	A home you own
	Brazil	Good health	Financial security	Free time/ leisure time	Travel for leisure	A home you own
	Mexico	Good health	Financial security	A home you own	Free time/ leisure time	Travel for leisure
Asia-Pacific	Australia	Good health	Financial security	Free time/ leisure time	A home you own	A happy marriage
	China	Good health	Financial security	A happy marriage	Free time/ leisure time	Travel for leisure
	Japan	Good health	Financial security	Free time/ leisure time	Control over one's own life	A happy marriage
	South Korea	Good health	Financial security	Free time/ leisure time	A happy marriage	Travel for leisure

Source: GfK survey among 23,000 Internet users (ages 15+) in 17 countries – multiple answers possible-rounded

2.3. Cognition and dimensions of Chinese well-being

In summary, there is evidence from research showing the difference in perception of well-being between countries. It is meaningful for the following up evaluation work to summarize the cognition and dimensions of Chinese well-being. As we deepen our research on traditional culture and recent survey results, it is obvious that it is a complicated issue for China to improve people’s happiness. On the one hand, the cultural continuity determines that Chinese people still value self-improvement and family interest. On the other hand, compared to those western developed countries, China still needs to solve social welfare and public service issues such as environmental issues, housing issues, medical care, and so on. The improvement of basic security and public services is still meaningful to the promotion of Chinese well-being. Therefore, the contemporary understanding of well-being in China, or the satisfying life state nowadays of Chinese, could be summarized as: under the support of the social environment and sound facilities guarantee, one could have a healthy physical and mental state, maintain harmonious family relations and positive social relations, and pursue self-improvement and personal value without restriction.

There is no doubt that, the keynote of Chinese well-being is the foundation of well-being evaluation and it suggests that different personalities and the impacts of life events are the “noise” in the process of evaluating overall well-being at the city scale. However, questions remain: What kind of model is needed to actually make sense of these “Chinese signatures”, and How to build a framework that combines different dimensions for understanding the ever-developing level of happiness in the Chinese context?

It could be seen above that there is a certain hierarchy to meet the needs of happiness which is from internal states to external conditions. This also corresponds to the theory of Happiness Sphere, time geography and Maslow's Demand. Considering the validity and operability, we simplified the “sphere” into three dimensions and take it as a division of the framework of the evaluation system: individuals and

families, social life, and living environment. What needs to be illustrated is that combining the individual and the family as the first dimension aims to reflect the characteristics of Chinese people's emphasis on intergenerational communication and interpersonal relations.

3. Data and Methods

3.1. Research design

This study compares and analyses the degree of happiness and urban development on the city level in mainland China by constructing an index. Based on the 3 dimensions previously classified, further work was carried out to break down specific areas. As each dimension has been extensively researched, we focus on the important fields and key aspects of Chinese culture mentioned above, which are also used as a basis for the selection and amalgamation of the many fields. For example, the Chinese people's need for self-improvement was considered by including self-actualization in the personal family dimension and innovation and entrepreneurship in the social life dimension. As a result, the fields of the index framework are ordered from basic to advanced, which refers to Maslow's hierarchy of needs.

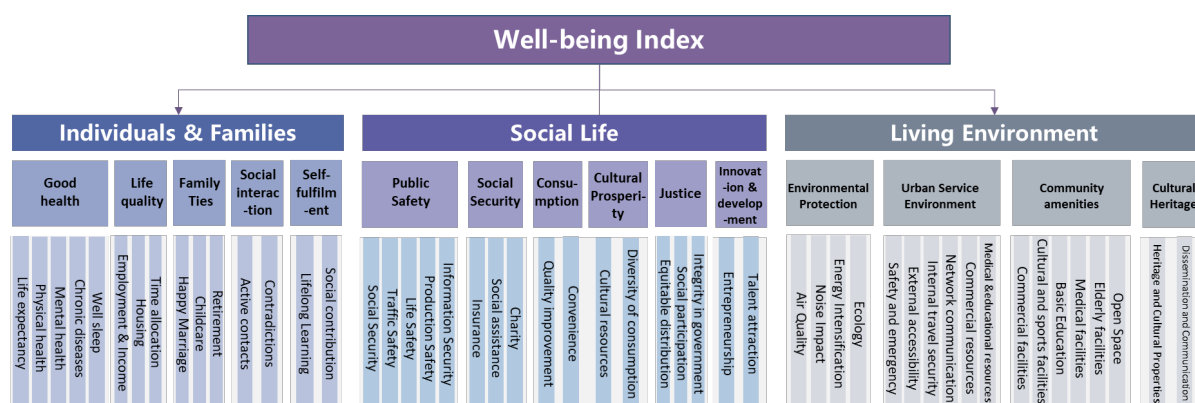


Figure 1 Framework of well-being index in the Chinese context

After building an index framework, it tests by analysing the panel data of 33 main cities of mainland China from 2016 to 2020. To adapt the data set for the purpose of this study, only the capital cities and cities specifically designated in the state plan from mainland China are included. Because the higher and equal administrative levels of these cities result in greater availability, accessibility and comparability of statistical data and new data.

3.2. Fieldwork and weighting

In the current survey on people's most important concerns, housing (including property prices), healthcare, education, and retirement are among the top concerns. Food safety, price levels, and environmental protection are also hot topics. To further understand people's perception of happiness and their needs in each region, 3722 questionnaires were collected. Residents in eastern China cared more about the individuals and families level, while those in central and western China placed more importance on aspects of the hardware environment, such as the availability of facilities and the convenience of services.

The weighting design was based on the Delphi method and further adapted to Chinese characteristics. On the one hand, the weighting of the indicators was adjusted by focusing on multiple categories of people and highlighting the key concerns. Through the above-mentioned public opinion and questionnaire research, we could identify the concerns of people in the new era and the key points to enhance their happiness and strengthen the weighting of these sections. For example, the weighting of sections such as

family and social security is correspondingly higher. On the other hand, regional development differences are taken into account and the weighting is differentiated by region. Considering the different levels of development and people's livelihoods in different areas of China, the weighting of each indicator is differentiated by the focus of the people in each region.

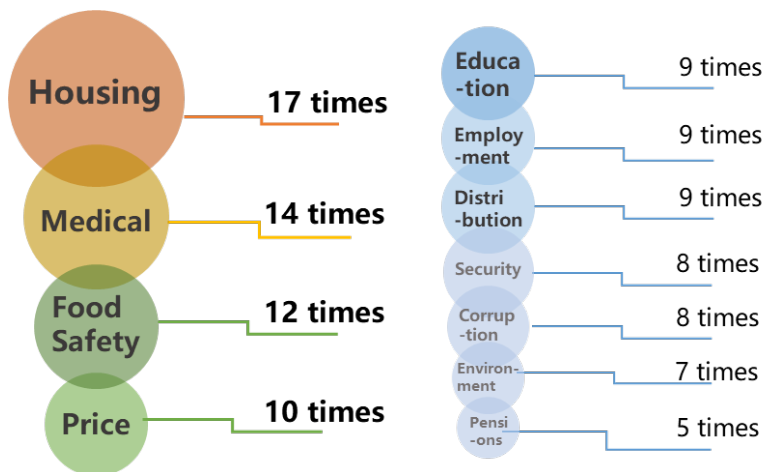


Figure 2 2009 - 2020 High-frequency words in the list of the most important issues concerned by the public

Source: China Xiaokang Index, Survey on Top 10 Most Concerned Focus Issues

3.3. The urban-level indicators

In the process of selecting urban-level indicators, we have developed a number of principles. The first is to focus on the outcome, such as choosing the average pm2.5 concentration or air quality index for environmental quality evaluation, instead of process type indicators such as pollutant emission situation. The second is to refer to common indicators used by academics at home and abroad, so as to facilitate later comparisons with the situation in developed countries such as OECD for individual indicators. The third is that in addition to the traditional statistical indicators, we have combined field visits and questionnaire surveys to respond to the hot issues of concern to residents. Indicators were selected to directly reflect people's growing aspirations for a better life. For example, in recent years, issues related to time allocation such as "996"¹, extreme long-distance commuting, and paid leave have been hotly debated on the internet. For this reason, "commuting time" was chosen as a response to this hot topic. The fourth is to choose diverse indicators with different kinds of data sources for the same field. People's well-being is dynamic rather than static. As the level of urban development rises and the social environment changes, people's pursuit of happiness is different. Therefore, in order to better respond to changes, diverse indicators are selected to form a reserve pool of indicators and updated on an annual basis.

The data sources in the indicator reserve pool include both traditional statistical data and new data. There are currently 185 sets of basic data collected, of which 55% are from traditional statistics and 45% are new data. On the one hand, data is collected from publicly available government statistics. Mature and representative traditional statistics are useful for judging the current well-being of the population and past trends. On the other hand, we collect data from internet data, big data and map data to compensate for the low relevance of traditional data to people.

The lower the degree of correlation between the indicators in the index, the higher the independence of the indicators and the correspondingly lower the redundancy between the indicators. Barbour suggests that a correlation coefficient $|R| > 0.75$ indicates that two indicators are highly correlated. This method

¹ "996", which means work from 9 AM to 9 PM, 6 days a week.

was used for the selection of indicators. Pearson correlation analysis was first conducted on all indicators. Secondly, the absolute value of Pearson's correlation coefficient > 0.75 within the same dimension was selected. Then the city-scale data was applied again to the screened indicator system for trial calculation and comparison of results. After multiple rounds of trial calculations and correlation analysis screening, the indicator screening process was then completed.

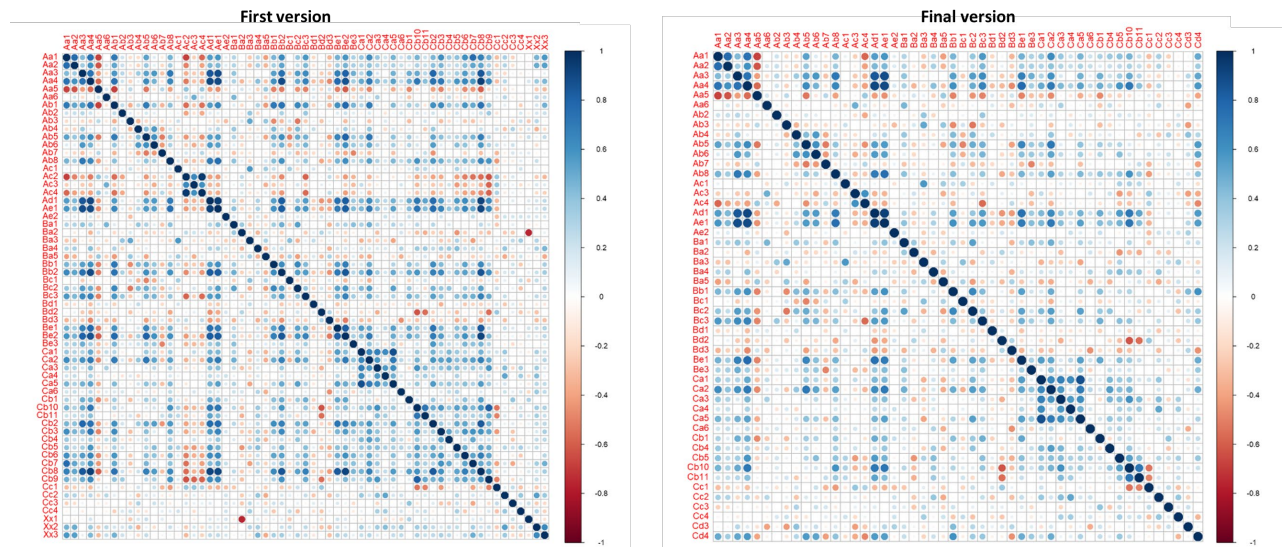


Figure 3 Pearson correlation analysis on all indicators – first version (left) & final version (right)

3.4. Data analysis

In terms of the overall happiness scores by city, there are still no cities that have reached the excellent level. Considering that the standardization method used is maximum-minimum standardization (see formula), the standardized score for each indicator is a relative score, where the best performance for the indicator is 100 and the lowest is 0. In this context, the theoretical maximum score that each city can achieve is 100.

Positive indicators
$$X_i^* = \frac{\max x_i - x_i}{\max x_i - \min x_i} \quad \text{Formula1}$$

Negative indicators
$$X_i^* = \frac{x_i - \min x_i}{\max x_i - \min x_i} \quad \text{Formula2}$$

In reality, however, only five cities in the first tier - Shanghai, Hangzhou, Beijing, Guangzhou and Shenzhen - have scored above 60. The reason for this is that each city has its own strengths and weaknesses. The cumulative strengths of cities are offset by their weaknesses. No city has achieved a balanced score and performed well in all three spheres. There is still a long way to go before the city as a whole is good in all areas and the benefits of development could be equally shared with its people. There is still a need to continuously optimise the level of urban development with the aim of improving people's well-being.

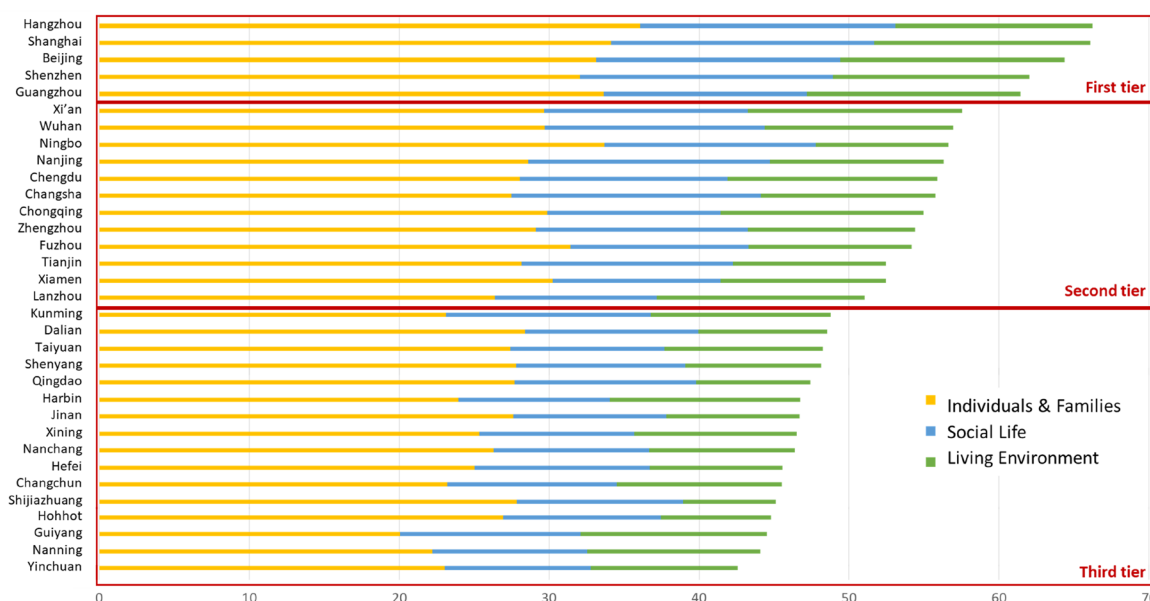


Figure 4 List of Well-being Index scores of 33 cities of mainland China

Through the coupling analysis of the happiness index score and the relationship between populations, cities with a high population inflow have a relatively high happiness index score (e.g. Xi'an, Shenzhen and Hangzhou). It is clear that the level of well-being of residents also reflects to some extent the ability of cities to attract people. It is also a reflection of the fact that people actually choose the cities they want to live in according to their needs.

Table 2 Population growth versus well-being index ranking

Rank of Well-being Index	City	Resident population (10,000) in 2018	Resident population (10,000) in 2017	Growth in resident population in 2018 (million)	Growth rate in resident population in 2018 (million)
6	Xi'an	1000.4	961.67	38.73	4.03%
4	Shenzhen	1302.66	1252.83	49.83	3.98%
1	Hangzhou	980.6	946.8	33.8	3.57%
11	Changsha	815.47	791.81	23.66	2.99%
5	Guangzhou	1490.44	1449.84	40.6	2.80%
13	Zhengzhou	1014	988.1	25.9	2.62%
16	Xiamen	411	401	10	2.49%
8	Ningbo	820.2	800.5	19.7	2.46%
25	Jinan	746	732.12	13.88	1.90%
10	Chengdu	1633	1604.47	28.53	1.78%

4. Findings in specific cities

4.1. Beijing: Representative of the big cities which have distinct advantages and disadvantages

On the one hand, Beijing, as the capital of China, is well known for its shortcomings. The pain points of people's livelihoods are concentrated and prominent. The most typical ones are the high housing prices and the extreme commuting distances. In terms of house price to income ratio and rent to income ratio

data for 2020, Beijing is second only to Shenzhen. However, in terms of historical data, house prices in Beijing remain high, which places a huge burden on young people struggling to stay in the city. High rents are also a cause of long commutes and long hours. This further reduces the length of time young people have to spend on leisure and rest. In addition, the frequent occurrence of haze and dusty weather in the winter and spring in the north makes the issue of air quality another major concern. The significant improvement in air quality in recent years has led to an increase in satisfaction.

On the other hand, a large number of young people continue to stay in Beijing every year for the benefits of the abundant jobs and the high level of public services. Beijing has 58 tertiary hospitals and 92 higher education institutions, both of which are among the highest in China. There is no doubt that Beijing has gathered a large number of high-quality universities, which has contributed to the development of the city's comprehensive strength. The combination of industry, academia and research has enhanced scientific research while also providing better and more convenient services to the city's residents. In addition, as a cultural centre, Beijing has a profound historical and cultural heritage, and many modern arts have been able to meet the people here.

Beijing has given full play to the ability of a large city to gather quality resources. These strengths remain unmatched by other cities in China in a short period of time. Despite the widespread criticism of the big city disease, the overall situation is still not so flawed.

4.2. Hangzhou & Shenzhen: Representatives of cities with outstanding strength in innovation and research

As the top-ranked major provincial capital city in terms of well-being index score, Hangzhou has an overall balanced development that meets the diverse needs of its people. In recent years Hangzhou's research and innovation strength has followed the pace of first-tier cities. 55,539 patents were granted and 3,586 new market entities were created. Top internet companies such as Alibaba and Netease provide the community with high gold-added jobs and opportunities.

Shenzhen is recognised as having an extremely strong innovation and entrepreneurial atmosphere. It ranks fourth in the well-being index and performs particularly well in the development dynamics. The new business environment, which is different from that of the industrial cities in the north of China, greatly encourages entrepreneurship. Shenzhen has more than 8,000 technology companies and a large number of listed brands. The enterprise structure is flexible and diversified, and the net inflow of talents occupies the top position among first-tier cities.

In addition, the higher satisfaction of residents with Hangzhou and Shenzhen is also reflected in the convenient and livable urban environment. The living environment and quality of life are guaranteed by better facilities: convenient transportation, diversified commercial and other public services, a good green environment with a city greening rate of over 50%, etc. Hangzhou, for example, is well connected to the cities of the Yangtze River Delta, with fourteen cities accessible by rail within one hour. However, Hangzhou and Shenzhen are relatively short of quality public services, and both the quantity and quality of higher medical and educational resources need to be improved.

Overall, the large number of young people coming to Hangzhou and Shenzhen shows that residents recognise the cities' development and expect to find a balance between their lives and their dreams in the cities. For young Chinese who value the pursuit of their dreams and self-fulfillment, a broader and more innovative range of jobs remains an important 'plus point'.

4.3. Chengdu: Representative of residents enjoying a diverse and relaxed life

Chengdu ranks 10th in terms of happiness score, ranking higher among western cities. Unlike Hangzhou and Shenzhen, the main reason for Chengdu's higher ranking is that there is a high level of community

living convenience. The density of various facilities is balanced, closely linked to the community and highly accessible. It is able to meet the needs of Chinese people in terms of family life. Compared to first-tier cities such as Beijing and Shanghai, Chengdu has the advantage of being a relatively less stressful city to live in and creating a richer and more interesting life experience for its residents.

Based on the POI information of various public service facilities and the AOI information of centralised residential areas, Kernel Density analysis was conducted by ArcGIS. The results show that the density of commercial facilities in Chengdu is outstanding. The density of commercial facilities within one kilometre of the residential area surpasses that of Beijing and Shanghai and is only poorer than that of Guangzhou and Shenzhen. Cultural and recreational facilities are evenly distributed, with a relatively high number of teahouses, chess and card rooms, and other recreational facilities. This provides Chengdu residents with a rich and varied cultural life.

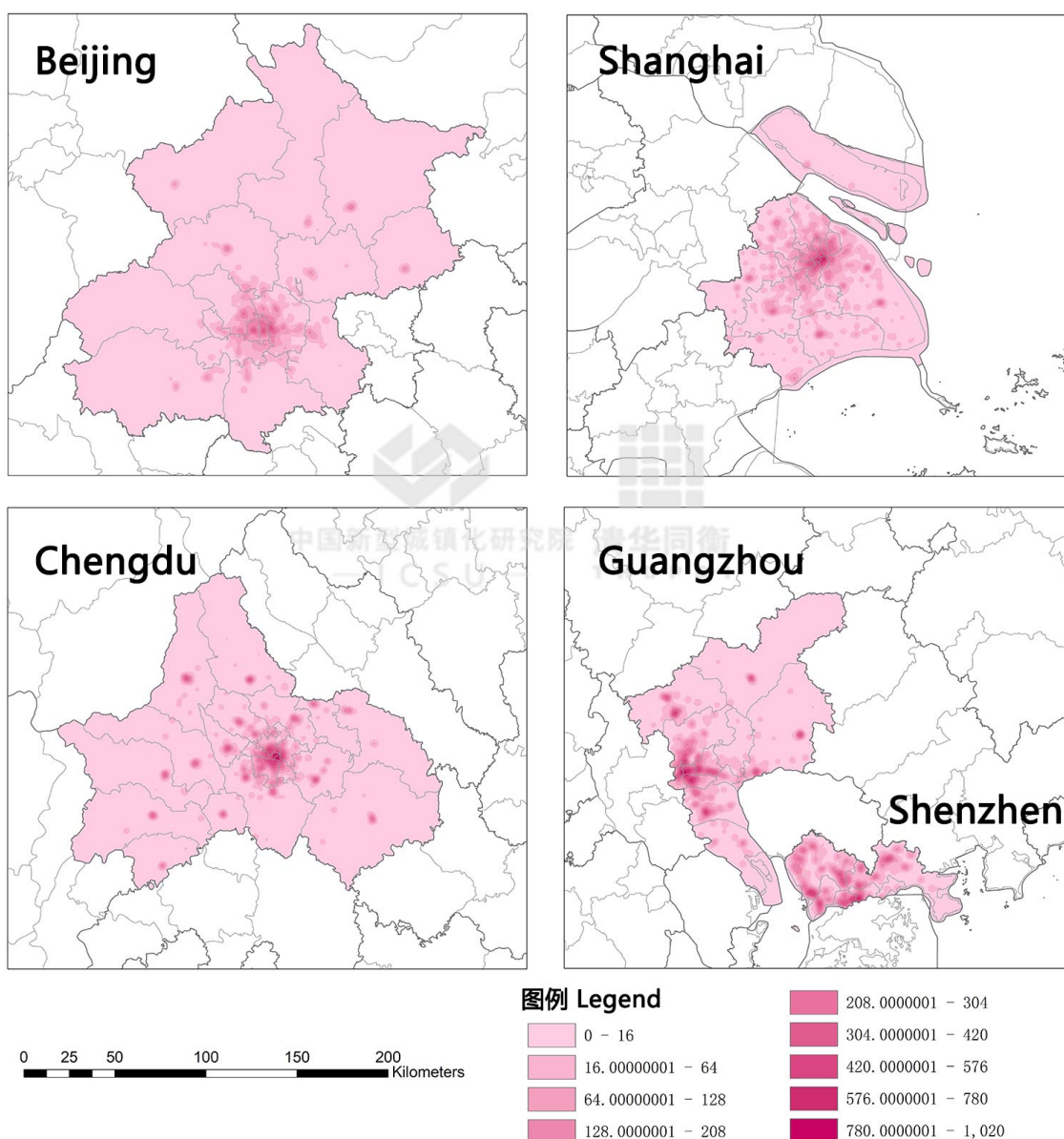


Figure 5 The Kernel Density analysis of commercial facilities within one kilometre of the residential area

Yet, Chengdu's air pollution problem still needs to be improved, with PM2.5 exceeding the national average for two consecutive years. Also, Chengdu's social service initiatives are relatively weak, and there

is still much potential for improvement in the number of volunteers and social organisations. This will be an important direction for Chengdu's future urban development to improve.

5. Discussions

5.1. Future directions for application on the urban level: focus on both residents' well-being and urban development

Local governments should formulate appropriate policies to improve well-being in the context of local development, so as to facilitate the formation of urban development policies in the next phase.

Considering that human capital externalities increase with the size of the city for cities with high levels of economic development and high population density (e.g. Beijing, Shanghai, Guangzhou, Shenzhen), the focus of talent services should be on the creation of a liveable and workable environment, which is also the focus of efforts to improve the well-being of residents. As commuting, housing and pollution problems are more prominent in large cities, the government should reduce the crowding effects and negative impacts of expanding cities through a polycentric urban spatial layout, as well as investing heavily in transport infrastructure, talent flats, education and healthcare conditions and environmental management.

For medium-sized cities (e.g. Chengdu, Hangzhou, etc.), the rise in recent years has been driven by the combined effect of the concentration of talent and population on the competitiveness of the city. A less crowded urban environment than in major cities such as Beijing has made "liveability" and "convenience" important city brands in attracting people. In addition, both Chengdu and Hangzhou have used financial subsidies to guide innovative companies and innovative talent to locate here. These initiatives have led to a greater variety of employment options and provided residents with more possibilities for self-fulfilment. When medium-sized cities combine a degree of liveability, friendliness and self-fulfilment, the happiness of their residents is enhanced.

Due to the unbalanced development between eastern China and western China, the quality of public services and physical living conditions are still the main constraint to well-being in some relatively undeveloped areas. This is also reflected in our subsequent study which further expanded the sample to over 300 prefecture-level cities across China, and these kinds of cities are concentrated in small cities in central and western China. In other words, the improvement of life satisfaction in these cities will be achieved by improving the external environment. Therefore, this type of city should pay more attention to the improvement of the ecological environment and public service issues, which is also an area that western residents pay more attention to in the questionnaire research.

5.2. Innovations and limitations

In summary, it is feasible to construct a complex system of indicators to measure the well-being of residents and to compare them across multiple cities. The results of this measurement will not only provide feedback on the development of the city, but will also help to indicate the direction in which the city can improve the well-being of its residents. This attempt to propose a new evaluation criterion aims at evaluating the development of a city from the actual experience of its residents, which is different from previous attempts. The relationship between the level of people's well-being and the level of urban development can be visualised in a continuous monitoring process.

While the attempt in this study highlights the benefits of an integrative approach of measurement, it is important to note that because the integrative approach focuses on human-situational interactions and reveals the complexity of happiness, it tends to lack the simplicity and elegance of traditional main effects approaches to theorising and studying happiness.

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7. References

- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56, 81–105.
- Cattell, R. B. (1943). The description of personality: I. Foundations of trait measurement. *Psychological Review*, 50, 559–594.
- Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, 52, 281–302.
- Diener, E., Emmons, R. A., Larsen, R. L., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49, 71–75.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070.
- Lykken, D., & Tellegen, A. (1996). Happiness is a stochastic phenomenon. *Psychological Science*, 7, 186–189.
- Tellegen, A., Lykken, D. T., Bouchard, T. J., Wilcox, K. J., Segal, N. L., & Rich, S. (1988). Personality similarity in twins reared apart and together. *Journal of Personality and Social Psychology*, 54, 1031–1039.
- Schwarz, N., & Strack, F. (1999). Reports of subjective well-being: Judgmental processes and their methodological implications. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 61–84). New York: Russell Sage.
- Kitayama, S., & Markus, H. R. (2000). The pursuit of happiness and the realization of sympathy: Cultural patterns of self, social relations, and well-being. In E. Diener & E. M. Suh (Eds.), *Culture and subjective well-being* (pp. 113–160). Cambridge, MA: MIT Press.
- Wilson, T. D., & Gilbert, D. T. (2008). Explaining away: A model of affective adaptation. *Perspectives on Psychological Science*, 5, 370–386.
- Hsee, C. K., Hastie, R., & Chen, J. (2008). Hedonomics: Bridging decision research with happiness research. *Perspectives on Psychological Science*, 3, 224–243.
- Lyubomirsky, S., Sousa, L., Dickerhoof, R. (2006). The costs and benefits of writing, talking, and thinking about life's triumphs and defeats. *Journal of Personality and Social Psychology*, 90, 692–708.
- Lewin, K. (1948). *Resolving social conflicts: Selected papers on group dynamics*. New York: Harper.
- Snyder, M. (1993). Basic research and practical problems: The promise of a "functional" personality and social psychology. *Personality and Social Psychology Bulletin*, 19, 251–264.
- Oishi, S. (2012). *The Oxford Handbook of Personality and Social Psychology*. 1st edn. Available at: E-book format [Chinese University of Hong Kong].
<https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780195398991.001.0001/oxfordhb-9780195398991> (Accessed: 09 August 2021)

Oishi, S. (2006). The concept of life satisfaction across cultures: An IRT analysis. *Journal of Research in Personality*, 41, 411–423.

Oishi, S. (2010). Culture and well-being: Conceptual and methodological issues. In E. Diener, J. F. Helliwell, & D. Kahneman, (Eds.), *International differences in well-being*. New York: Oxford University Press.

Vittersø, J., Biswas-Diener, R., & Diener, E (2005). The divergent meanings of life satisfaction: Item response modeling of the Satisfaction with Life Scale in Greenland and Norway. *Social Indicators Research*, 74, 327–348.