



# A Scientometric Analysis of Life Course Research Based on CiteSpace

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**Abstract.** Life course theory reflects individual's life trajectory in the location of history, which afterwards becomes a research paradigm that connects the personal level and the societal level. This study aims to take a historical and social perspective to examine the change and development of life course research and attempt to figure out the research tendency and hot spots. It is found that the life course research started from sociological domain and then diffused to the epidemiology and psychology field. However, its hot topics have always related to the classic theme on social issues. The trend in life course research is very much consistent with the changes of society.

**Keywords:** Life course research · scientometric analysis · social change · research paradigm

## 1 Introduction

Life course research is derived from sociological studies of the Chicago School in the United States before 1940s, when the thriving of economy and society was accompanied with many social problems, such as transgression and crime. The life course theory reflects individual's life trajectory in the location of history [1], which afterwards becomes a research paradigm that connects the personal level and the societal level. In other words, the theory insists that people in one community or group may share the same value system [2], which in some way provides a propelling force for them to present a similar picture of life course and then reflects the whole social prospect. It shows the great significance to have the individual or collective characteristics embedded into its social context.

In sociology, the life cycle concept is usually associated with three main themes, individual's aging, family formation and organizational development [3], which has some overlaps with life course theory. However, the concept of life course is now employed in a much broader sense in that it avoids the determinism in the nature of life cycle.

Given that the theory pays much attention to personal life and social structure, the greatest concern relates to the change of population composition and family formation. In one word, countries that have experienced capitalist economy share a common trend:

fewer babies, longer lives [4]. Hence the life course research has inevitable connection with people's physical health and collective mind, which is destined to its growing use in fields beyond sociology. Its diffusion not only opens the window for the synthesis of interdisciplinary studies, but also brings challenges to keep an integrated and coherent paradigmatic core, even though Merton (1968) mentioned that the development of life course research should be attributed to the interaction between theory and fact investigation [5].

Despite that the life course studies have diffused to many other disciplines; they are not freed themselves from the societal level. This study aims to take a historical and social perspective to examine the change and development of life course research and attempt to figure out the research tendency and hot spots. A scientometric method is adopted to answer the following research questions in this study:

- (1) What are the changes in the topics of life course research since 1970? And what have remained unchanged?
- (2) Which countries, institutions have significant influence and contribution to the development of life course research?
- (3) What are the research frontiers, hot topics, and future trends in life course research?

## 2 Materials and Methods

### 2.1 Data Source

In this section, data retrieval strategy and resulting dataset are introduced. The Clarivate Web of Science Core Collection (WOSCC), the world's largest and most comprehensive database of academic publications [6], was applied to retrieve a dataset with high quality. The following search strategy was taken in the WOSCC on 28 May 2020:

Title = life course OR Theme = life course

A title-based search strategy was used so as to make sure that target articles accurately focus on life course. With the above data retrieval strategy, the resulting dataset contained 17,642 articles, which can be regarded as the majority of scientific body of literature on life course. The timespan of these literatures ranges from 1970 until 2020 (inclusive). The time slicing is set to be 3 years.

### 2.2 Data Visualization Tool

CiteSpace is a freely available Java application for visualizing and analyzing trends and patterns in scientific literature. It not only is designed as a tool for progressive knowledge domain visualization [7], but also focuses on finding critical points in the development of a field or a domain, especially intellectual turning points and pivotal points. We use the Citespace (5.0.R1) for the bibliometric studies to detect the keywords, authors, countries, institutions in the co-occurrence networks. Besides, cluster analysis and reference co-citation analysis are also based on the CiteSpace (5.0.R1).





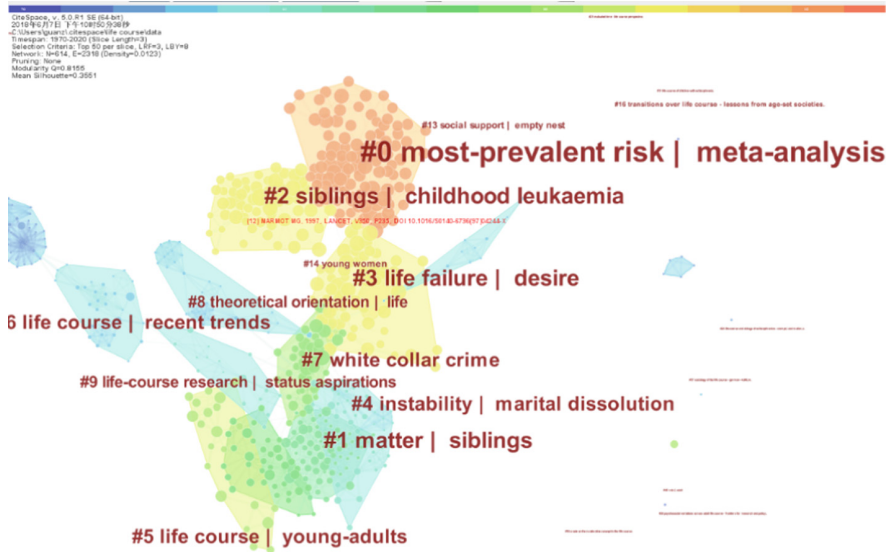


Fig. 3. Cited references clustering. (Source: the authors.)

### 3.3 Cited Reference Clustering

The most important function of CiteSpace is to examine the citation and reference analysis of the dataset. The cited reference clustering map (Fig. 3) shows a high modularity value of 0.8155, which indicates that the specialties of the ten labels are significantly structured in terms of co-citation clusters. The mean silhouette value is lower than 0.5 (0.3551), showing that the clusters are relatively heterogenous, probably because of the existence of many small-size clusters. In Fig. 3, it is found that the research topics are mainly focused on most-prevalent risk, siblings, life failure, instability, young adults, and white-collar crime, which have covered almost all the most important life events and their key impact factors in people's whole life course. Therefore, we can infer that the development of life course research relies on the exploration in classic sociological theme, and further investigation based on those topics is one of the significant dynamics of the evolution of the life course paradigm.

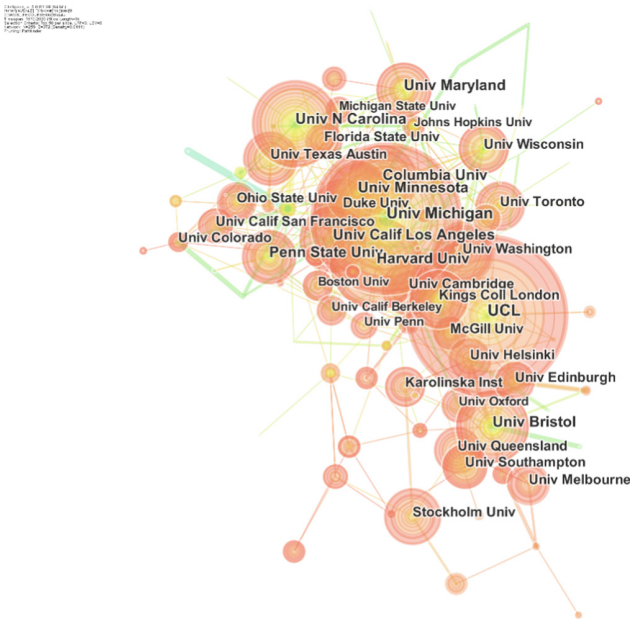
### 3.4 Most Influential Institutions

The threshold of minimum number of institutions is met by 115 of the total 259 organizations. Table 2 shows the ten most productive institutions that have published articles of life course studies. Among them, the two largest nodes as shown in Fig. 4 are UCL (University College London) and University of Michigan, both of which values are much higher than the rest of institutions. Interestingly, the start place of life course research, Chicago School of the University of Chicago cannot be observed in Fig. 4, while substantial organizations known as medical school like Karolinska Institution in Sweden, John Hopkins University, University of Maryland, and Harvard University are catching up fast in this research domain.

**Table 2.** Most productive institutions

Rank	Institutions	Occurrence frequencies	Centrality	Year
1	University College London	536	0.02	2000
2	University of Michigan	500	0.05	1998
3	University of California	338	0.02	1986
4	Harvard University	336	0.01	1998
5	University of Bristol	287	0.03	1999
6	University of California Los Angeles	275	0.02	1998
7	University of Minnesota	270	0.01	1998
8	Columbia University	267	0.03	1998
9	Pennsylvania State University	260	0.01	1998
10	University of Maryland	249	0.01	1998

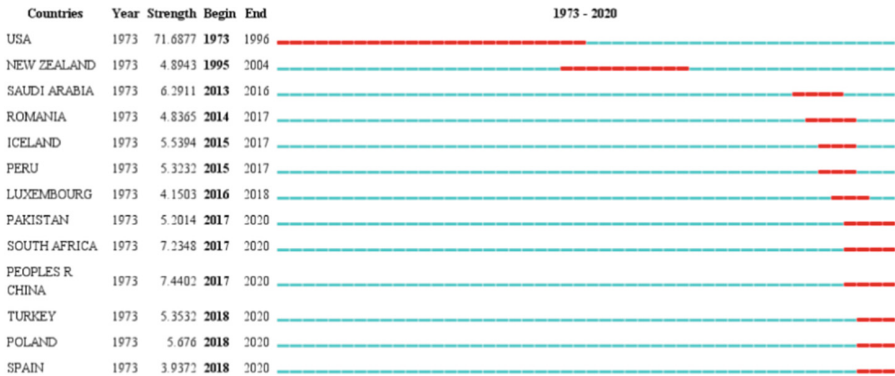
Source: the authors.



**Fig. 4.** Map of institutions occurrence. Link between two nodes represent collaboration of the institutions. (Source: the authors.)

**3.5 Burstness**

Via the “burstness” function of CiteSpace, we detect the sudden increase of certain items, such as countries and references, in order to examine the transition or turn in the



**Fig. 5.** Top 13 Countries with the strongest citation bursts. (Source: the authors.)

course of the whole life course research history. Figure 5 shows the top 13 countries with the strongest citation bursts. The United States, as the birthplace of life course studies, have a strong burst from 1973 to 2006, indicating a dominant advantage in this research field. However, several countries, Pakistan, South Africa, China, Turkey and Poland, have shown stronger bursts in recent years, suggesting the research focus has gradually shifted from the most developed countries to those developing countries which start to establish the relationship between their citizens' own life course and the societal changes in a macroscopic view.

Through the analysis of the burstness of references in dataset, it can be found that the 3 most influential references from all the literatures are written by Moffitt TE and Ben-Shilomo Yoav who have highest citation rate during 2000–2010. Their researches focus on developmental psychopathology and epidemiology respectively. The article titled “Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways among males and females” by Terrie E. Moffitt and Avshalom Caspi [8] mainly discussed the influence of inadequate parenting and other behavior problems on the childhood-onset antisocial behavior. Also, they mentioned that gender difference plays a role. In “Life Course Epidemiology” by Ben-Shilomo Yoav et al. [9], the authors attempted to implement the life course models in epidemiological studies and emphasize the link between personal exposures in the life course and later life health outcomes [10].

Among the cited references in the recent 5 years, Shonkoff (2012) [11], Specht (2011) [12], Miller (2011) [13] have been constantly influencing the life course research, all of which are based on the background of medicine and psychology, suggesting the application field of life course research has always included those two main domains (Fig. 6).

## 4 Discussions and Implications

Since life course research is originated from the sociological domain, it hardly gets rid of its social nature, even though its studies have expanded towards other disciplines. Especially the combination of heterogenous studies and life course paradigm builds up the marriage between individual's life transition and social changes. To further explore

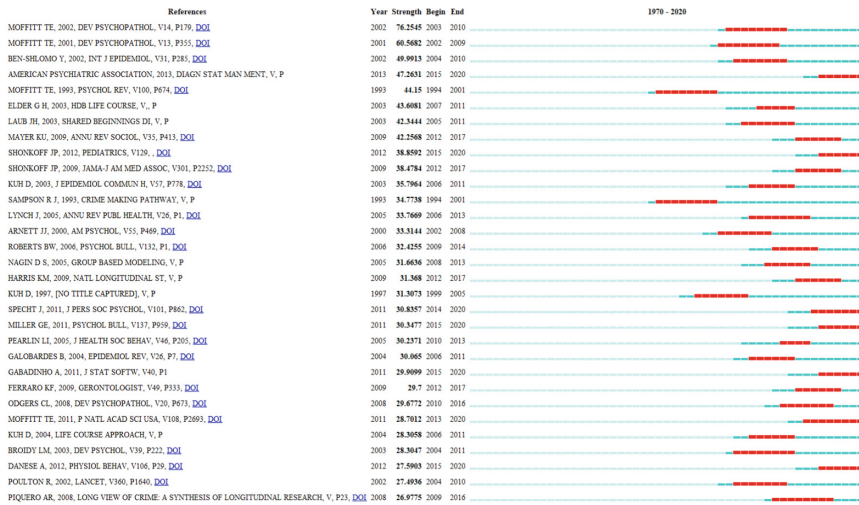


Fig. 6. Top 31 references with the strongest citation bursts. (Source: the authors.)

the logic of the life course research development, we try to make an analysis from two angles: the marketization of global economy and the institutionalization of social policy.

### 4.1 Marketization

After World War II, the wave of neoliberalism accelerates the advancement of marketization worldwide, which has brought up rapid economic and social development in the western countries. The earlier life course research topics are related with inequality and gender difference, which are both social problems induced by the imbalance of people’s social economic status due to the prosperity of the economy. This division of two extremes reminded the world of the need of social justice and equality and the necessity to link people’s personal fate to the development of nation. During this period, people’s consciousness of asking for equal rights was awakened. As a result, topics on women and other vulnerable communities were emerging.

In addition, as the pursuit of longer lives, topics related to health and medicine are growing very fast in a substantial way. That demonstrates the transition in human’s need from merely survival to a higher-quality living. With the propelling of marketization, health industries become involved into capitalism, leading to health inequality. Life course paradigm offers a research strategy for researchers to investigate whether the earlier life environment will influence health outcomes in adulthood.

### 4.2 Institutionalization

The life course research also reflects the change of the relationship between government and the public. On the surface, western countries have taken a social governance strategy of “small-government”, yet the interference of government and institutions has permeated into every corner of people’s lives. For instance, disease and education are no



longer within private domain, but become public issues, suggesting a tighter connection between personal life event and social policies made by the government. The proposal for educational equality is also realized by all kinds of public and social policies. The focus of life course research is the result of the institutionalization of these methods.

## 5 Conclusion

In this study, a scientometric review of the life course research literatures has been presented, spanning the period from 1970 to 2020. Visualization tool, CiteSpace, is used to demonstrate the current trends and geographical patterns in this field. Furthermore, the distribution of contributing references and institutions and the evolution of the research domain are examined by descriptive analysis. This study provides novel insights from the social developmental perspective into the structure, patterns, and tendencies of the life course research, aiming to assist researchers to obtain a broader view in this domain. In summary, the trend in life course research is very much consistent with the changes of society.

## References

1. Elder, Glen H. Jr. 1998, "The Life Course and Human Development." In Richard M. Lerner (ed.), *Handbook of Child Psychology (Volume 1: Theoretical Models of Human Development)*. New York: Wiley.
2. Coleman, J.S. 1987, *Public and Private High Schools: The Impact of Communities*. New York: Basic Books.
3. O'Rand, Angela M. and Margaret L Kreker, 1990, "Concepts of the Life Cycle :Their History , Meanings, and Uses in the Social Sciences", *Annual Review of Sociology* 16:21-62.
4. Ermisch, J, (1990) *Fewer Babies, Longer lives*, York: Joseph Rowntree Foundation.
5. Merton, Robert K., 1968, *Social Theory and Social Structure*, New York: Free Press, Enlarged edition.
6. Li, J.; Goerlandt, F.; Reniers, G. An overview of scientometric mapping for the Safety Science community: Methods, tools, and processes. *Saf. Sci* 2020. under review.
7. Chen, C. (2004). Searching for intellectual turning points: Progressive knowledge domain visualization. *Proceedings of the National Academy of Sciences, USA*, 101 (Suppl.), 5303–5310.
8. T E, Moffitt, A, Caspi. Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways among males and females. [J]. *Development and psychopathology*, 2001, 13(2):355–75.
9. Ben-Shlomo Y., Mishra G., Kuh D. (2014) *Life Course Epidemiology*. In: Ahrens W., Pigeot I. (eds) *Handbook of Epidemiology*. Springer, New York.
10. Ben-Shlomo Y, Kuh D. A life course approach to chronic disease epidemiology: conceptual models, empirical challenges, and interdisciplinary perspectives. *Int J Epidemiol* 2002; 31:285–93
11. Shonkoff, Jack, P, et al. Neuroscience, Molecular Biology, and the Childhood Roots of Health Disparities. [J]. *Jama Journal of the American Medical Association*, 2009.
12. Specht, Jule, Schmukle, et al. Stability and Change of Personality Across the Life Course: The Impact of Age and Major Life Events on Mean-Level and Rank-Order Stability of the Big Five. [J]. *Journal of Personality & Social Psychology*, 2011.

13. Miller, Gregory E, Chen, etal. Psychological Stress in Childhood and Susceptibility to the Chronic Diseases of Aging: Moving Toward a Model of Behavioral and Biological Mechanisms. [J]. Psychological Bulletin, 2011.

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