A LLM Review of Social (In)fertility in Modern Households

Project title: 'Connecting Disciplines using Large Language Models - A Case Study of Generating Hypothesis to Map Social (In)fertility in Modern Households'

Work in Progress

Modern Households – Declining Fertility

Record numbers of women reach 30 child-free in England and Wales

In 1971, just 18% of 30-year-olds had no children – today the figure has risen to 50%, reports the ONS

Denis Campbell *Health policy editor*
Thu 27 Jan 2022 17.44 GMT

Two-child families remain the norm, but growing numbers of women are never becoming mothers or having only one baby. Photograph: Tetra Images, LLC/Alamy

3.5 million people in the UK affected by infertility.

THE TIMES
SATURDAY JULY 16 2022

Should we tax the childless?

The latest census has revealed plummeting birth rates and an ageing population. The UK needs radical ideas and a long-term plan to prevent crippling workforce shortages in the near future, argues demographer Paul Morland, who joined us for a live Q&A in the comments below

Nearly 30 per cent of births in the UK are now to mothers born overseas
GETTY IMAGES

Paul Morland · Sunday July 03 2022, 12.01am, The Sunday Times

Need to understand the structural factors of household (In)Fertility.

Falling birth rates are a problem but stop blaming women

Failed government attempts to cajole people into having children ignore the bigger picture

CAMILLA CAVENDISH   + Add to myFT

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Camilla Cavendish OCTOBER 15 2021   💬 507

Novel data-driven methods provide new insights into patterns of changing fertility.

Broad Research Question

How important is the local, geodemographic environment relative to other factors for social infertility?

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Micro   **Meso**   **Macro**

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How do **psychological factors** and social support networks affect fertility decisions?

How do **relationship stability** and dynamics influence decisions about having children?

How do **educational and career ambitions** impact the timing of childbearing?

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How do **social norms and cultural expectations** affect fertility intentions?

How does **access to healthcare and reproductive technologies** impact fertility choices?

How do l**iving conditions** and housing affordability impact decisions about starting a family?

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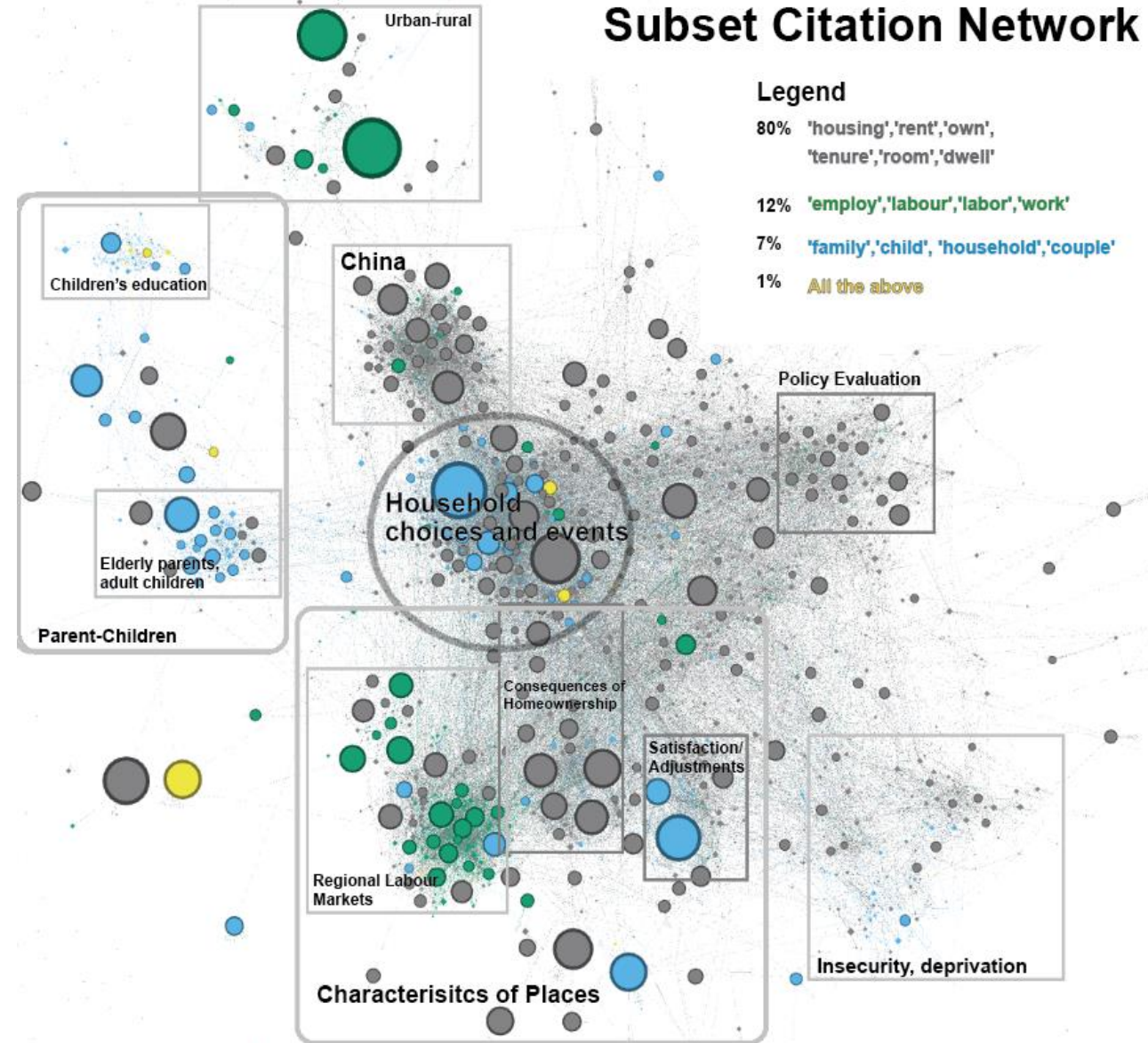
How does **access to healthcare and reproductive technologies** impact fertility choices?

How do l**iving conditions** and housing affordability impact decisions about starting a family?

How do **government policies and institutional support systems** influence childbearing choices?

How do **economic uncertainties** and job instability influence fertility decisions?

Goal: Translate between disciplines

Subset Citation Network

Legend
- 80% 'housing','rent','own', 'tenure','room','dwell'
- 12% 'employ','labour','labor','work'
- 7% 'family','child', 'household','couple'
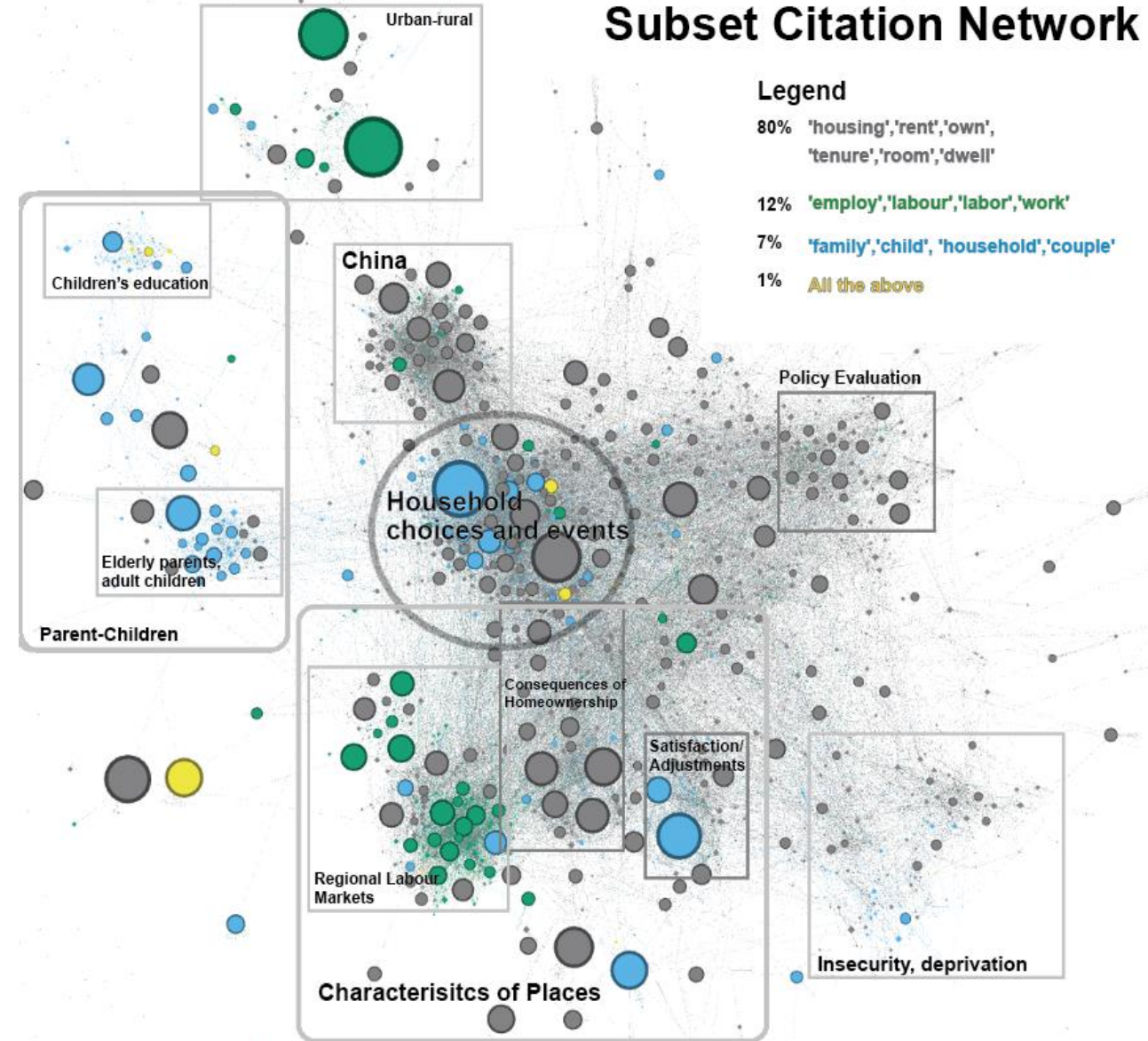- 1% All the above

housing subset from **Buyuklieva, B. and Raimbault, J. (2023) 'Estimating Bibliometric Links using Google Scholar: A Semi-Systematic Literature Mapping of Migration and Housing'. arXiv. Available at: https://doi.org/10.48550/arXiv.2302.10791.**

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Milestones:

1. Deliver a semi-systematic review of papers (where possible aided by LLMs for selection)

2. Develop a pipeline to use LLMs to generate document-based (i.e. 'informed') claims

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Urban-rural

Children's education

China

Policy Evaluation

Household choices and events

Elderly parents, adult children

Parent-Children

Consequences of Homeownership

Satisfaction/ Adjustments

Regional Labour Markets

Insecurity, deprivation

Characterisitcs of Places

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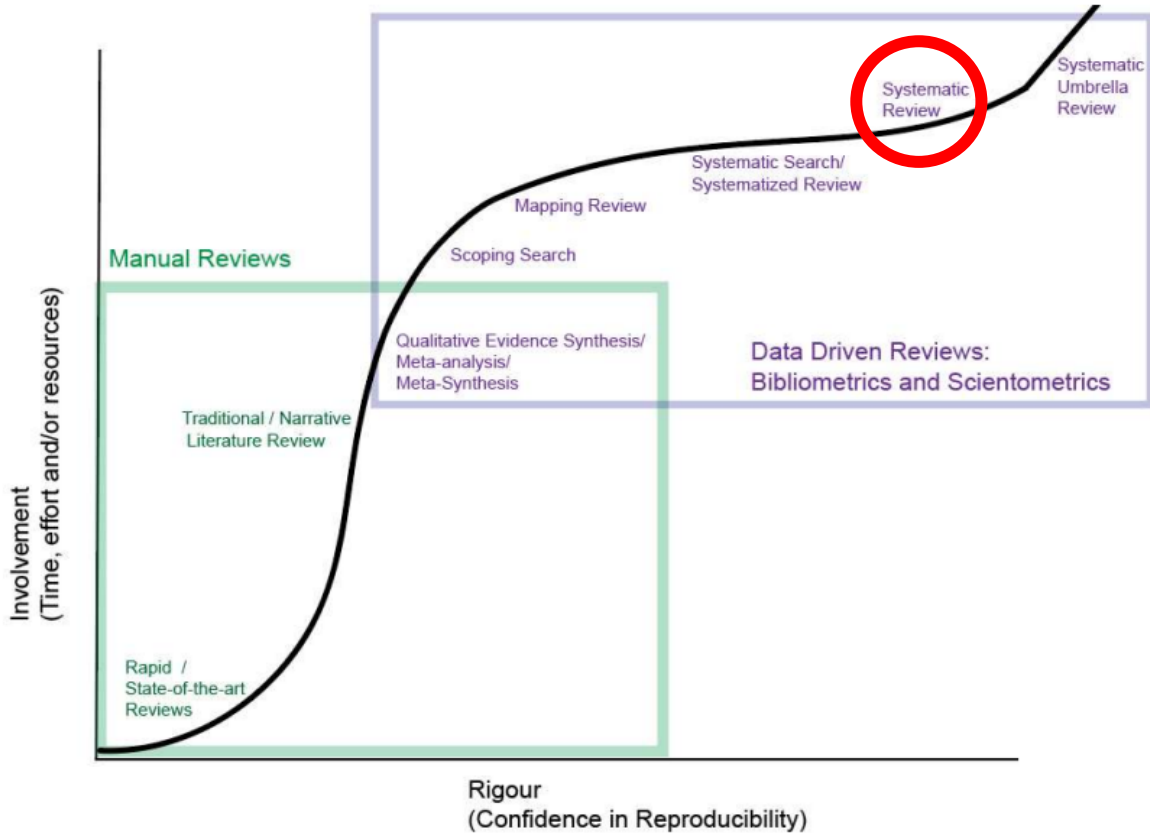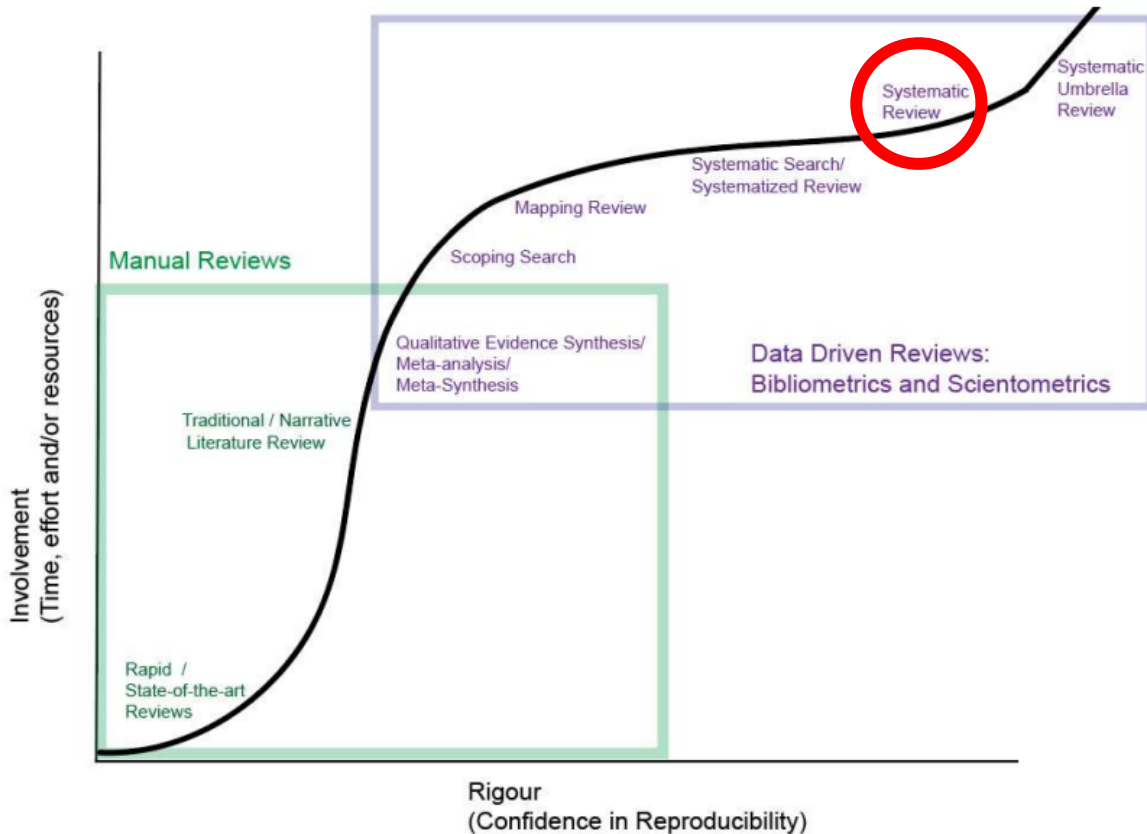
Traditional Reviews

Figure 1.1.   *Methodological Approaches of Reporting on Literature*

Traditional Reviews – Systematic Reviews

Figure 1.1.   *Methodological Approaches of Reporting on Literature*

Involvement / Scope: Broad to Narrow

Rigour: High to Low

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Purpose: Analytical to Descriptive

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A LLM Review

Systematic Review Step	Description	Task	LLM Assistance
Develop a Protocol	Create a detailed plan outlining inclusion/exclusion criteria, search strategy, and analysis methods.		
Conduct Literature Search	Perform an exhaustive search using predefined keywords and databases.	1 Clustering	identify synonymous concepts; suggest new relevant keywords
Screen Titles and Abstracts	Review titles and abstracts to identify studies that meet inclusion criteria.	2 Classification	automatically flag relevant studies by type)
Full-Text Screening	Review the full texts of selected studies for final inclusion.	3 'Chat'	highlight key sections that match the inclusion prompts
Data Extraction	Extract relevant data using a standardised form.		
Quality Assessment	Assess the quality of included studies using specific appraisal tools.	4 Summarisation	summarise full-text articles (by predefined subtopics)
Data Synthesis	Combine and analyse the extracted data to answer the research questions.	5 Summarisation	summarise 'summaries' to make claims across studies
Interpret Results	Interpret the synthesised data to draw conclusions and implications.	6 ?	attempt to provide interpretations based on the synthesised data, suggesting possible hypothesis

Ethics Issues?

1. Deliver a semi-systematic review of papers (where possible aided by LLMs for selection)

Potential issue 1: Does applying LLMs on papers breach any licensing agreement? It just depends on how these were downloaded?

Potential issue 2: Human and indexing biases in selection and analysis process?

2. Develop a pipeline to use LLMs to generate document-based (i.e. 'informed') claims

Potential issue 1: Defining good summarisation metrics.

Potential issue 2: The transparent way to report on methodologies with LLMs tools that are in constant development is unclear.

Conclusion

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Thank you.

Interested? Get in touch!
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