The Structure of Scientific Fields

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Introduction

- "Form of scientific **organization** [...] **mode of organization**" (Collins, 1994, 158-160)
- "**What is distinctive** about the social organization of the disciplines that we now take as natural science, and do the social disciplines have (or can they acquire) the **conditions that make possible that kind of organization**?" (Collins, 1994, 156)
- What sets appart "**high-consensus rapid-discovery**" from "**social**" science and "**humanities**"? (Collins, 1994, 158)
- "Hard" v. "Soft" sciences

Theory

Attention Space

- "Dynamics of the **Law of Small Numbers**, dividing the attention space among factions [. . .] a struggle for attention" (Collins, 1994, 158-160)
- "In any period of creative life, there are typically between three and six [...] lineages or schools" (Collins, 1994, 157)

H: When the **density of subfields** within a field surpasses six, the field is more likely to experience a tendency towards **consolidation**.

Theory

Scientific Revolutions (Kuhn, 2012)

- "Political revolutions aim to change political institutions in ways that those institutions themselves prohibit [...] necessitates the partial relinquishment of one set of institutions in favor of another [...] Initially it is crisis [...] that attenuates the role of political institutions [...] and the role of paradigms" (Kuhn, 2012, 93)
- "Recurrent debates about whether one or another of the contemporary **social sciences is really a science** [...] will cease to be a source of concern not when a definition is found, but when the groups that now doubt their own status **achieve consensus** about their past and present accomplishments" (Kuhn, 2012, 161)

H: Disciplines generally exhibit **stability**, with occasional episodes of significant **changes**.

Theory

Self-Similarity (Abbott, 2001)

- "Fractal pattern of division and convergence" (Abbott, 2001)
- "The quantitative – qualitative distinction repeats itself at each more detailed level even as the difference between positions narrows" (Harty and Shove, 2004)

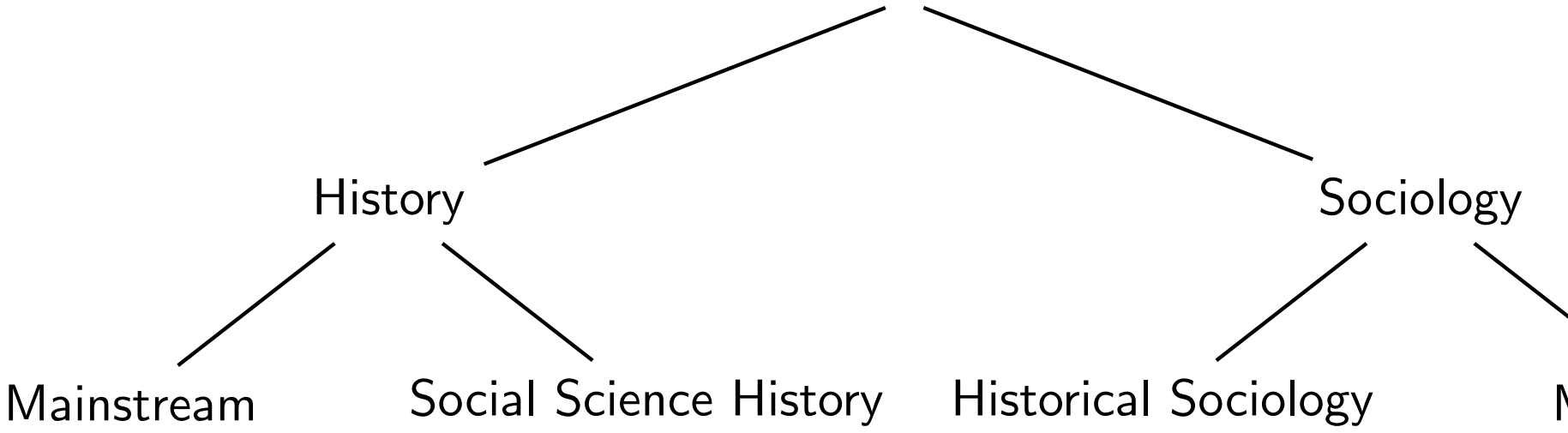

Figure: Fractal Distinctions

H: Within the field, subfields arise, exhibiting a replication of the core structure and retaining distinct features of the broader discipline

Theory

Diffusion (Mullins, 1973)

- "Successful cluster pays for its success by ceasing to exist [and] scattering" (Mullins, 1973, 24)
- "Routinization" and "Institutionalization" (**??**)

H: The diffusion of concepts should be apperent in these fields.

Data

Source

Top 5 journals from Google Scholar Top Publication

- Artificial Intelligence
- Economics
- Ethnic & Cultural Studies
- Gender Studies
- Genetics & Genomics
- Geometry
- Geophysics
- Human Resources & Organizations
- Immunology
- International Business
- Language & Linguistics
- Material Engineering
- Neurology
- Political Science
- Probability & Statistics
- Sociology

Data

Structure

Data


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diversity of market positions, especially in cultural fields. many prizes have three notable features
that together yield an emergent reward structure: (1) consumers treat prizes as judgment devices when
making purchase decisions, (2) prizes introduce sharp discontinuities between winners and also-rans,
and (3) appealing to prize juries requires costly sacrifices of mass audience appeal. when all three
conditions obtain, winning a prize is valuable, but seeking it is costly, so trying and failing yields
the worst outcome-a logic we characterize as a tullock lottery. we test the model with analyses of
oscar nominations and hollywood films from 1985 through 2009. we create an innovative measure of prize-
seeking, or "oscar appeal," on the basis of similarity to recent nominees in terms of such things as
genre, plot keywords, and release date. we then show that oscar appeal has no effect on profitability.
however, this zero-order relationship conceals that returns to strong oscar appeals are bimodal, with
super-normal returns for nominees and large losses for snubs. we then argue that the effect of judgment
devices on fields depends on how they structure and refract information.',
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Networks

- Citation: Directed Acyclic
- Co-Citation: Undirected weighted
- Co-Occurrence: Unidirected weighted

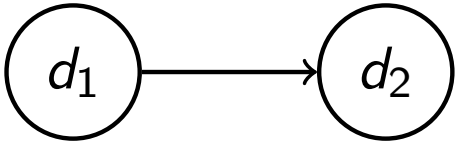
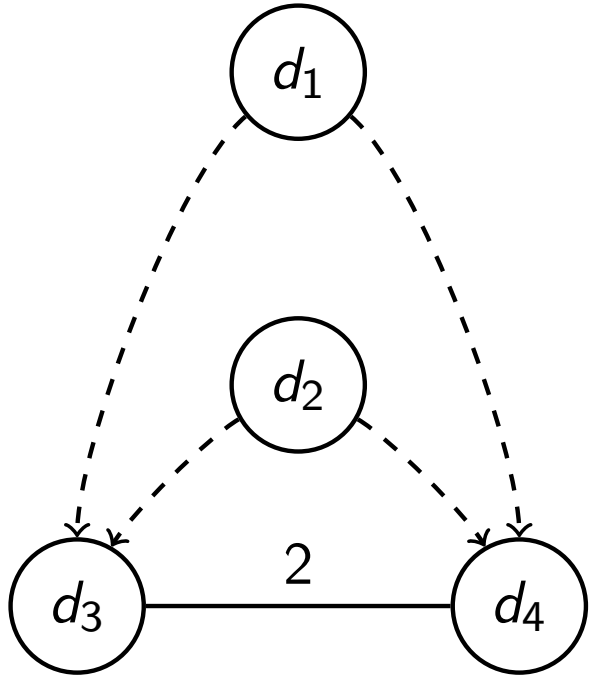


Figure: Citation



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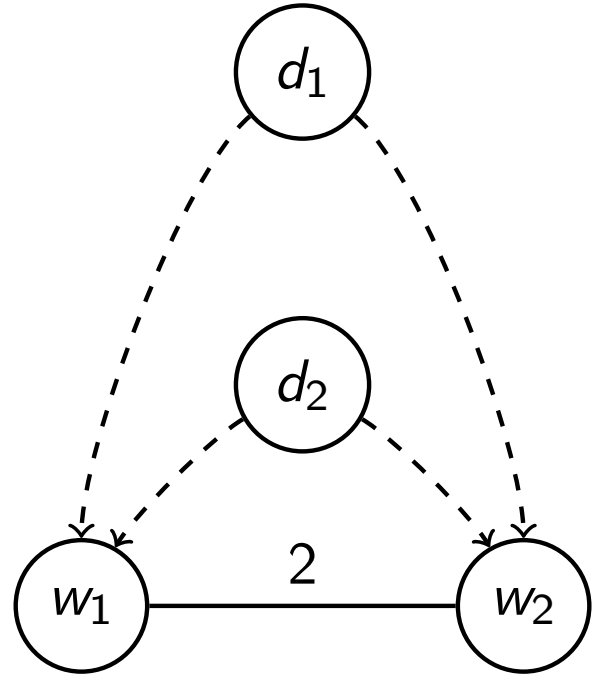
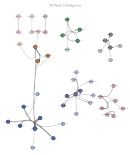


Figure: Co-Occurrence

Co-Citation Networks



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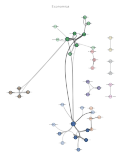
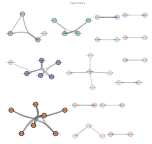


(b) Economics

(c) Ethnic & cultural studies

(d) Gender studies

(e) Genetics & genomics



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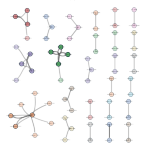

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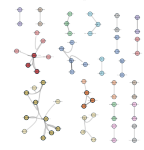
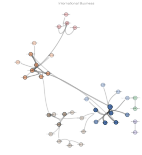
(h) Human resources & organizations



(i) Immunology



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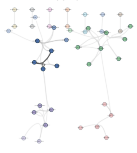

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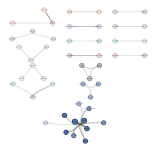

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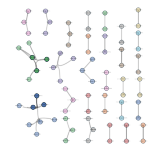
(m) Neurology



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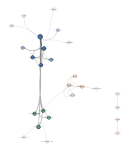

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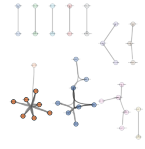

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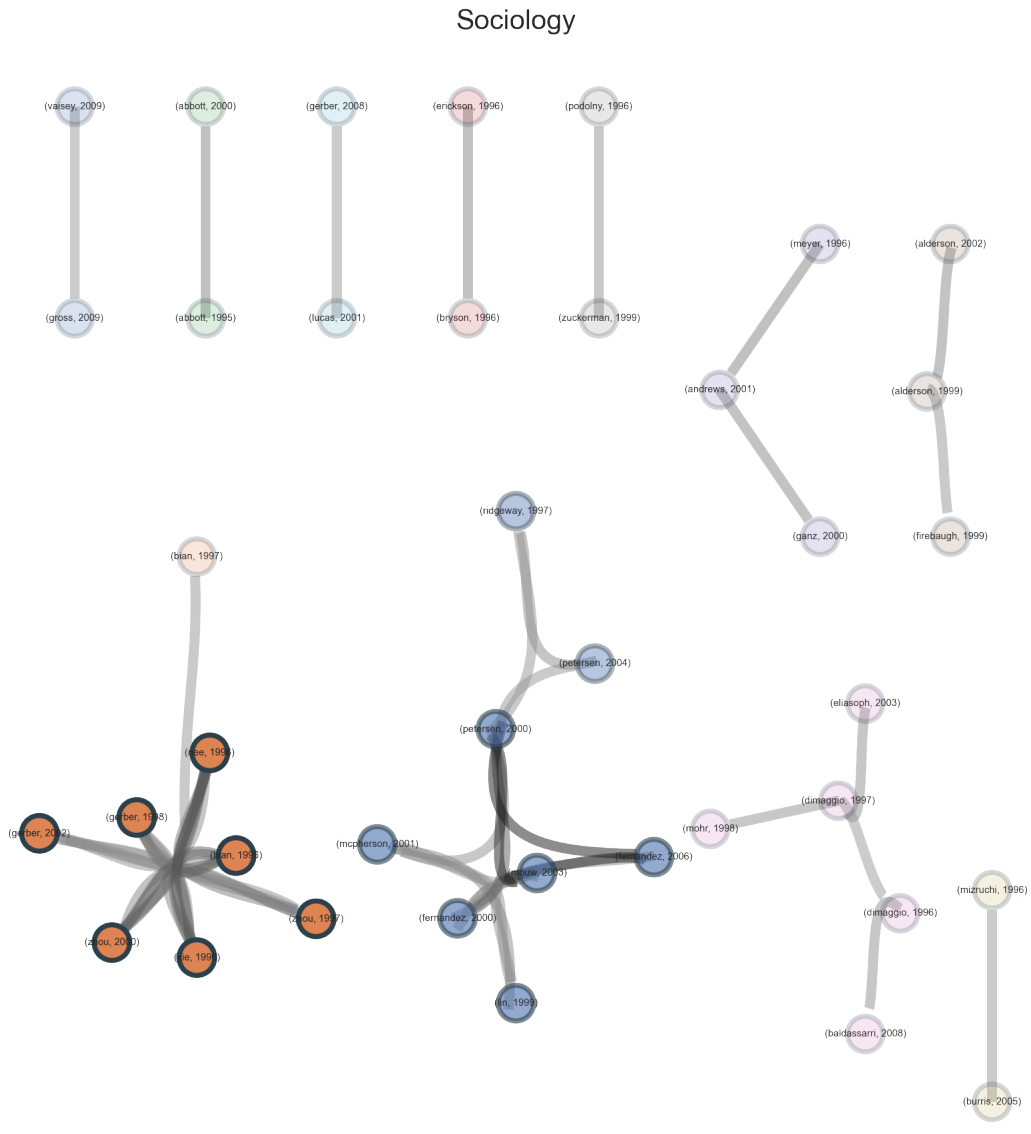

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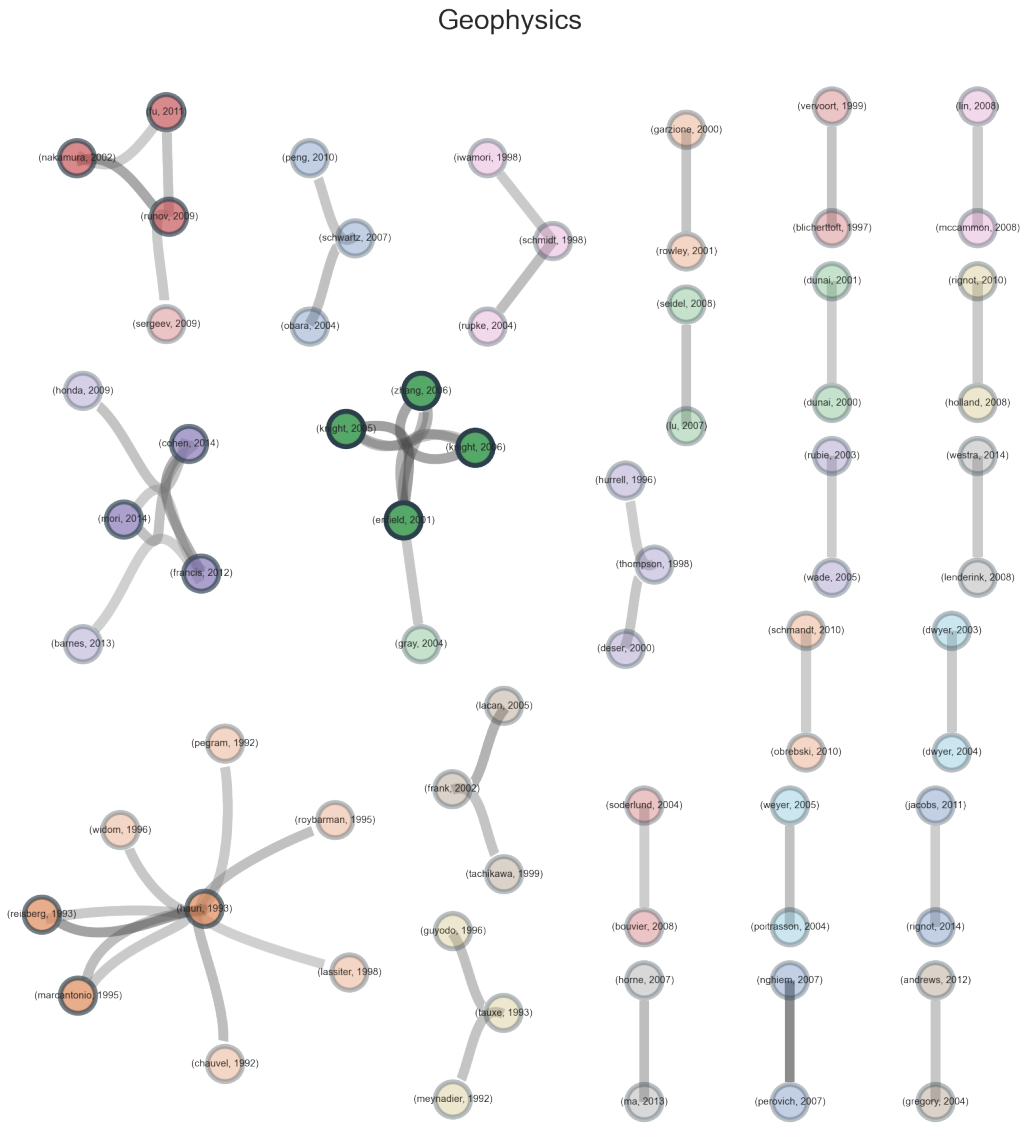

Co-Occurrence Networks

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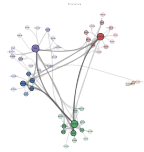

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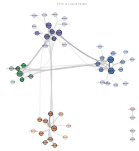

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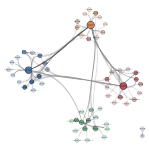

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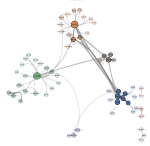

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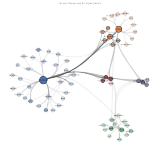

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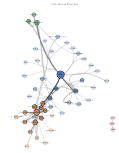

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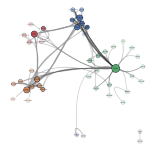

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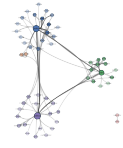

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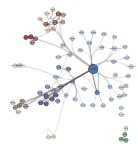

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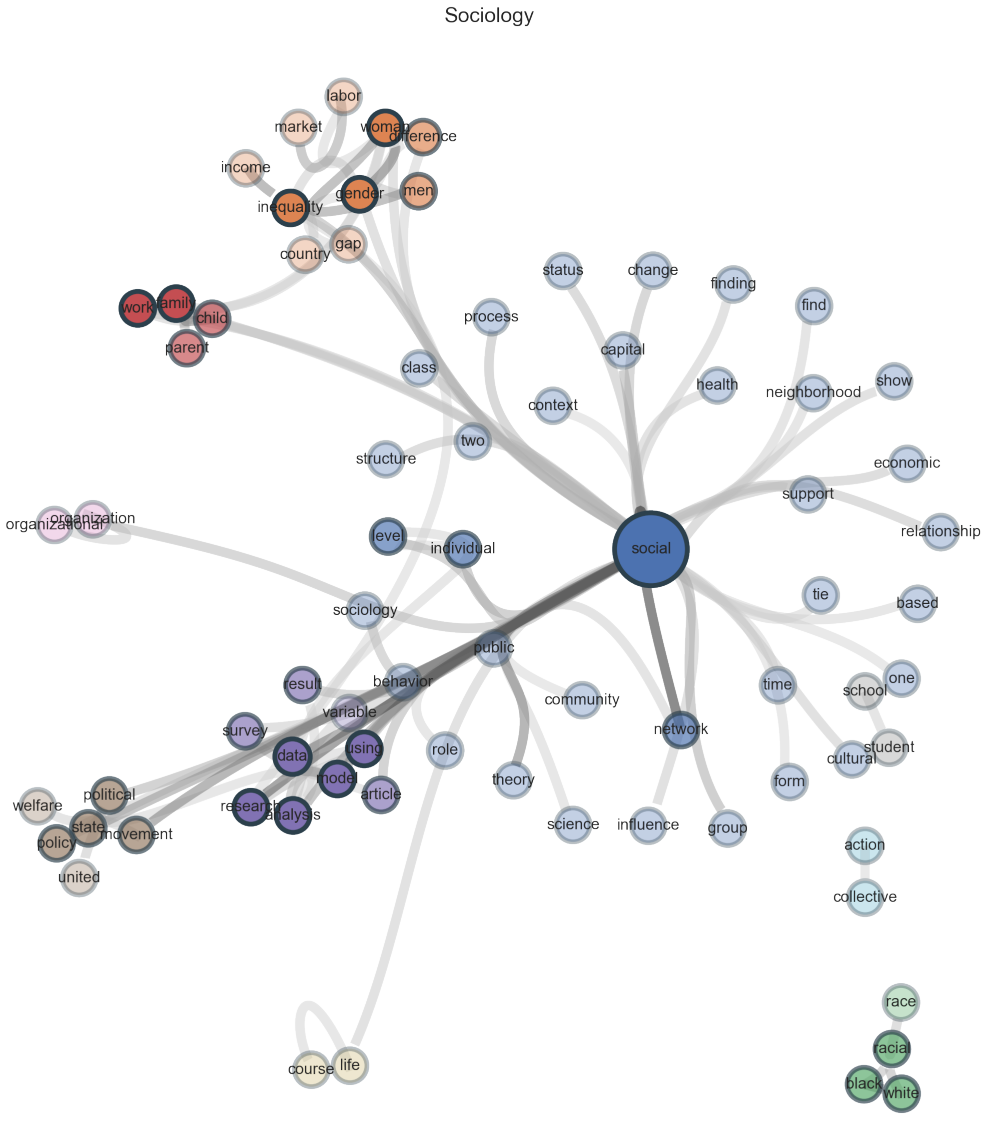

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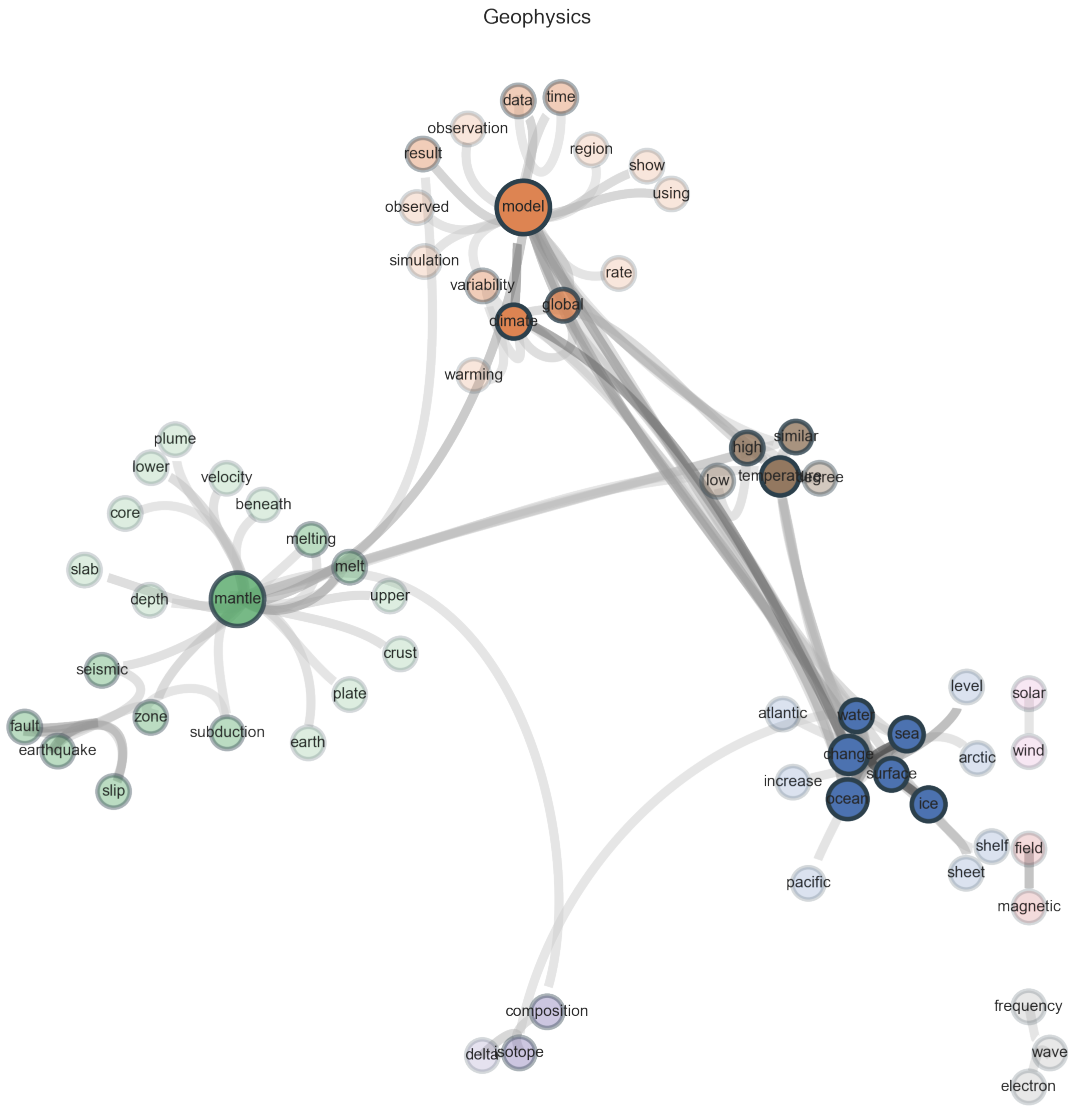

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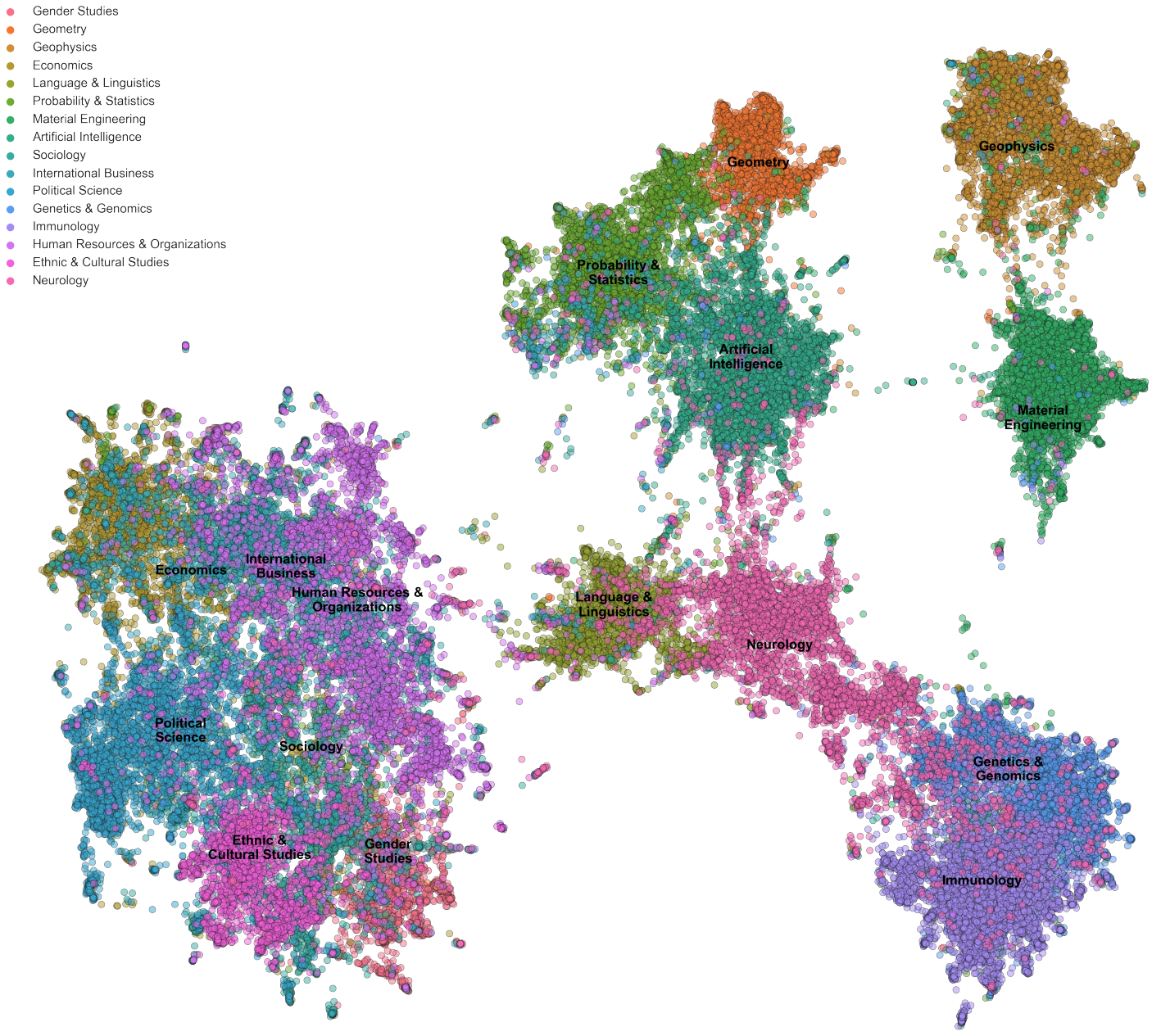

References I

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