

Class 7: Social search

Matthew J. Salganik

Sociology 204: Social Networks, Spring 2021
Princeton University

1/2: Search in the small world problem



Review

- ▶ sometimes the edges that don't exist are as important as the edges that do exist

Review

- ▶ sometimes the edges that don't exist are as important as the edges that do exist
- ▶ affiliation networks (people and groups) help us understand patterns in personal network structure

Review

- ▶ sometimes the edges that don't exist are as important as the edges that do exist
- ▶ affiliation networks (people and groups) help us understand patterns in personal network structure
- ▶ compare and contrast psychological vs sociological explanations for network structure

Review

- ▶ sometimes the edges that don't exist are as important as the edges that do exist
- ▶ affiliation networks (people and groups) help us understand patterns in personal network structure
- ▶ compare and contrast psychological vs sociological explanations for network structure
- ▶ sociological principles can shape the design of technical systems

Travers and Milgram showed two things

1. short paths exist
2. people can find them using only local information

Travers and Milgram showed two things

1. short paths exist
2. people can find them using only local information

Watts distinguishes between

- ▶ Broadcast search (what the six degrees website did in your wikipedia assignment)
- ▶ Directed search (what you did in your wikipedia assignment)

Travers and Milgram showed two things

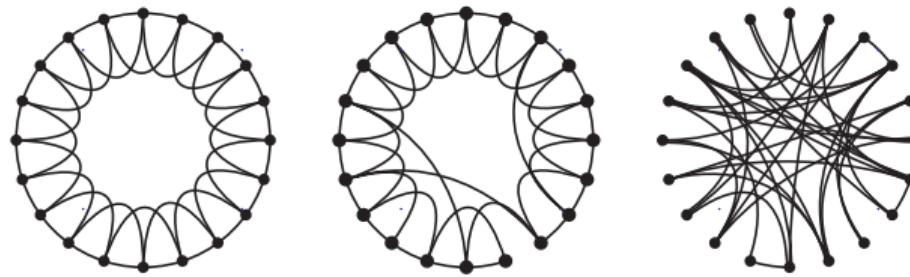
1. short paths exist
2. people can find them using only local information

Watts distinguishes between

- ▶ Broadcast search (what the six degrees website did in your wikipedia assignment)
- ▶ Directed search (what you did in your wikipedia assignment)

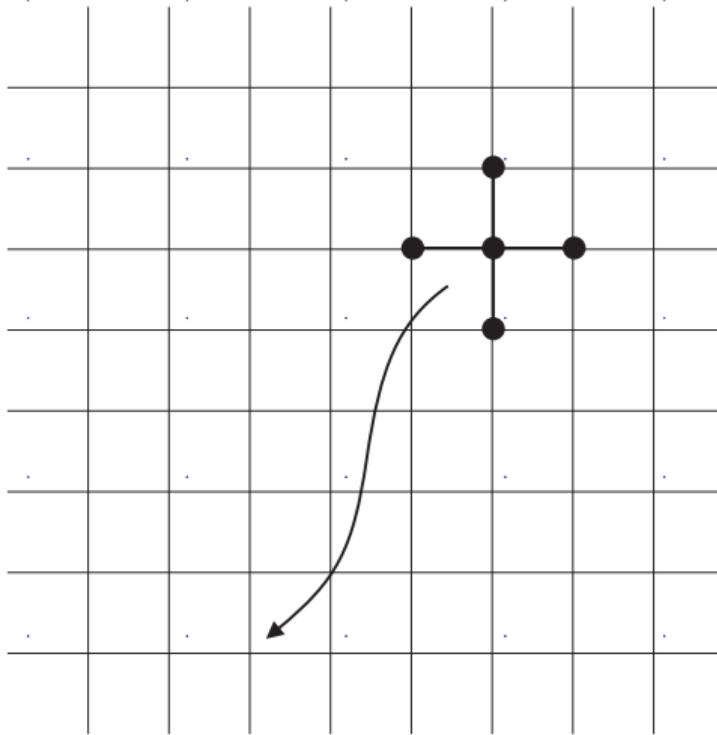
How is it that directed search ever works?

3.6

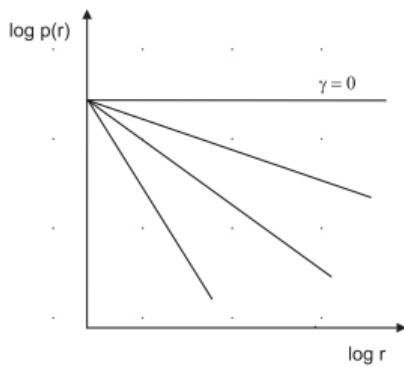


$\beta = 0$ —————→ $\beta = 1$
Increasing randomness

5.1

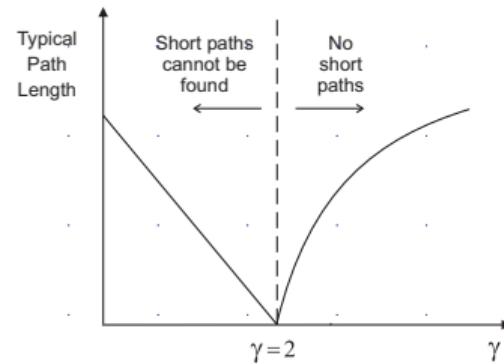


5.2



(a)

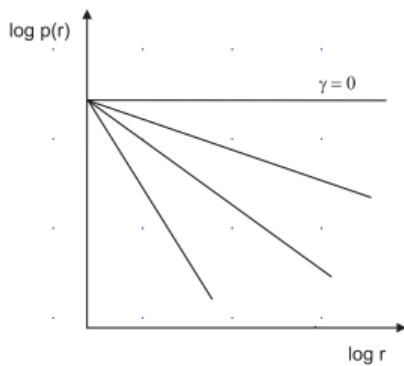
5.3



(b)

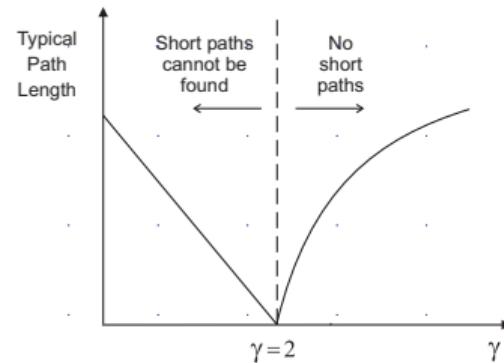
- ▶ low γ : lots of long connections, but networks not searchable

5.2



(a)

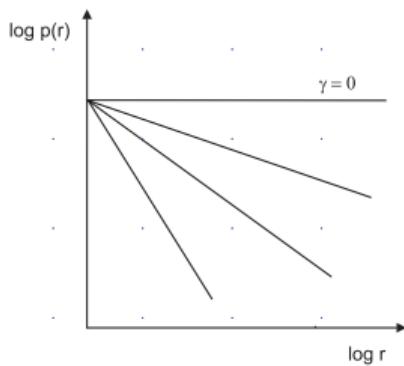
5.3



(b)

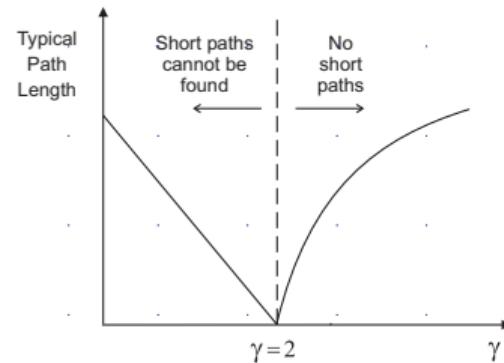
- ▶ low γ : lots of long connections, but networks not searchable
- ▶ $\gamma = 2$: same number of ties at all length scales, networks searchable

5.2



(a)

5.3



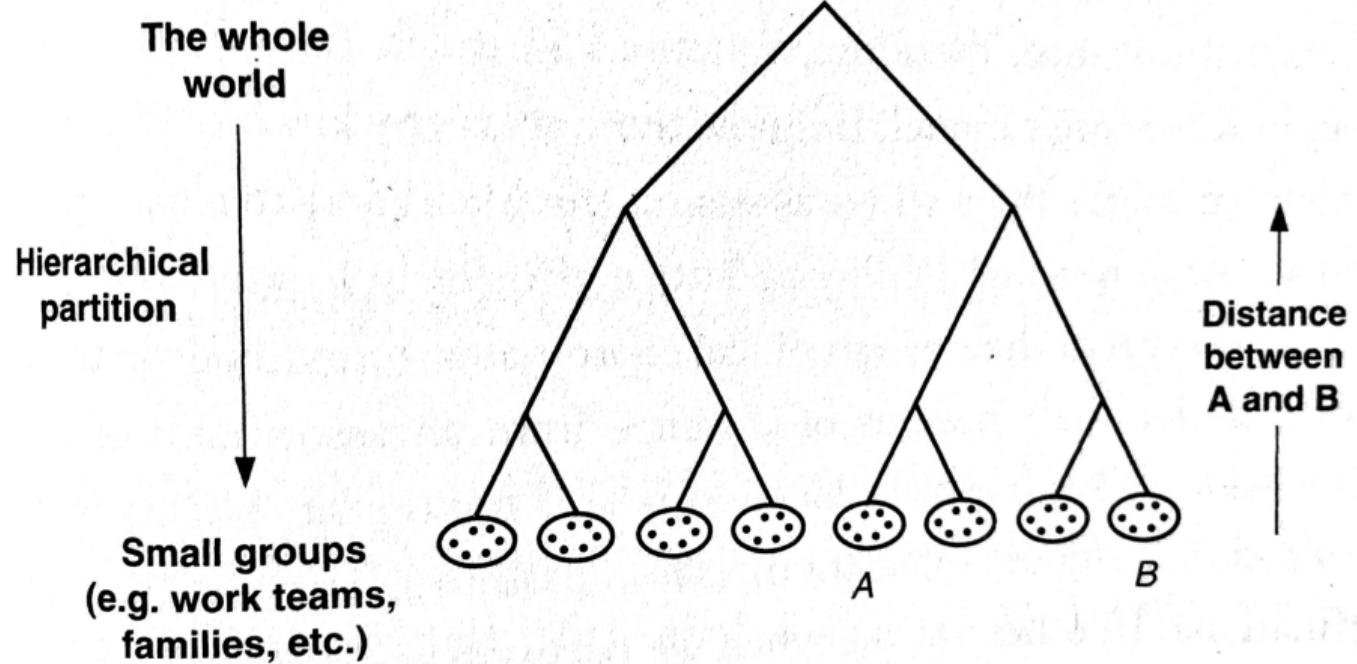
(b)

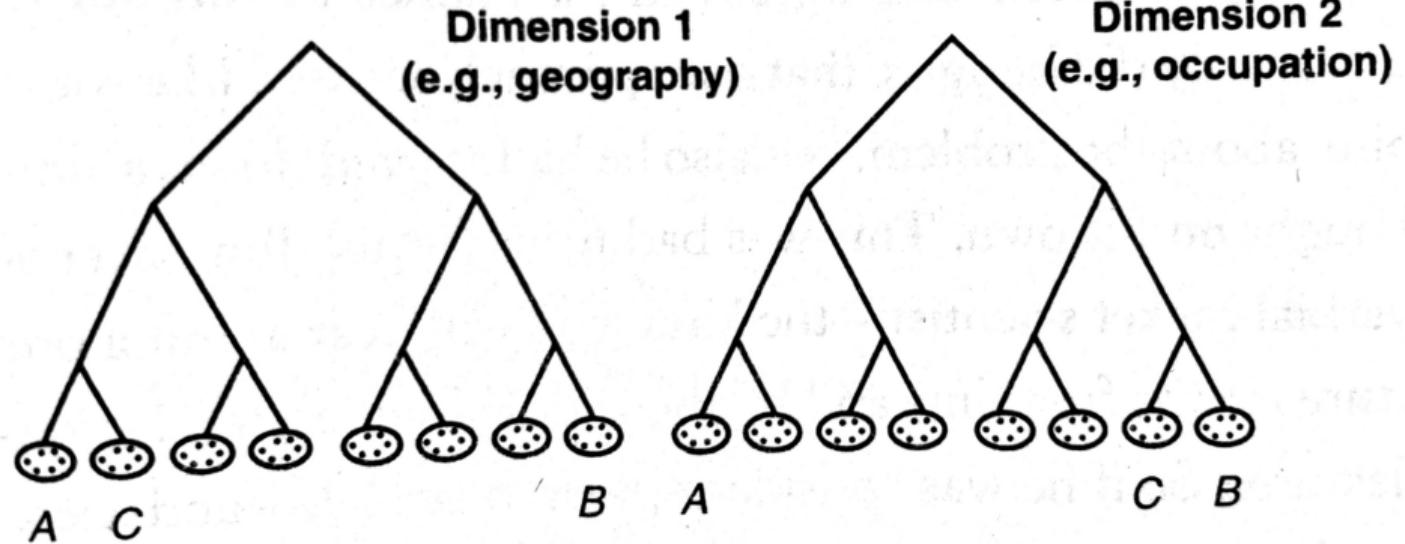
- ▶ low γ : lots of long connections, but networks not searchable
- ▶ $\gamma = 2$: same number of ties at all length scales, networks searchable
- ▶ high γ : no long connections, no short paths

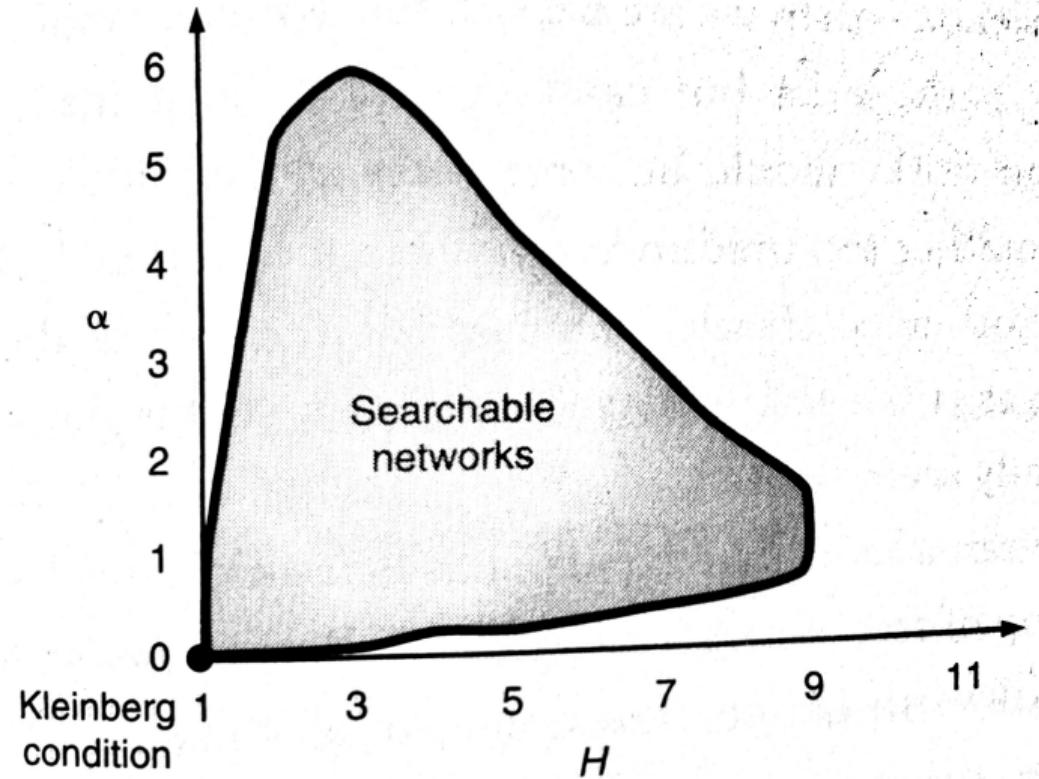
Navigation in a small world

It is easier to find short chains between points in some networks than others.

<http://dx.doi.org/10.1038/35022643>





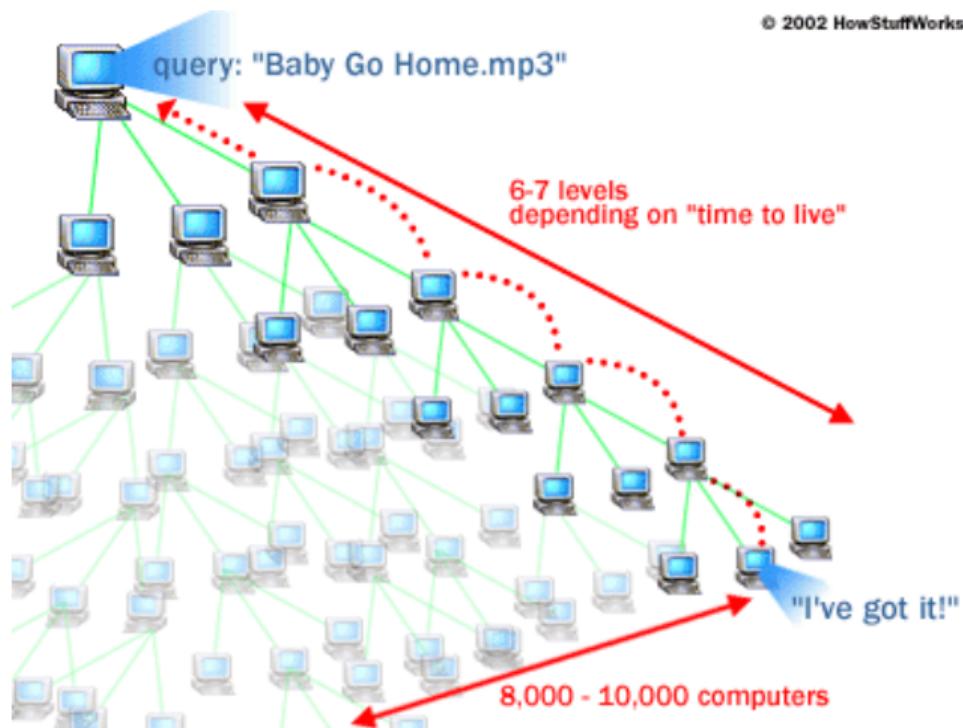


We will not define axes. Details of this model are not as important as the other models we have learned about.

Identity and Search in Social Networks

Duncan J. Watts,^{1,2,3*} Peter Sheridan Dodds,² M. E. J. Newman³

<http://dx.doi.org/10.1126/science.1070120>



Who cares about social search?