Class 7: Social search

Matthew J. Salganik

Sociology 204: Social Networks, Fall 2021
Princeton University

Monday, September 27, 2021

1. Watts, Chapter 5.
2. Lee, N.H. (1969). *The Search for an Abortionist*: Preface, Chapter 1, and Chapter 5.

Review

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- affiliation networks (people and groups) help us understand patterns in personal network structure

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- 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

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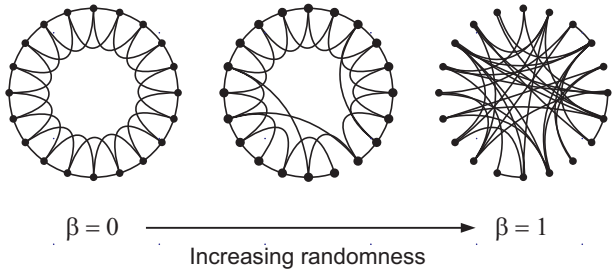
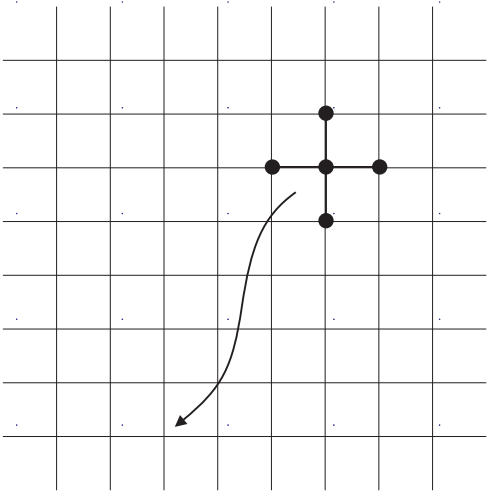
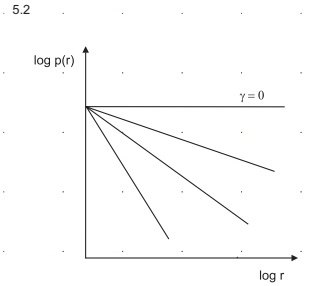
How is it that directed search ever works?

3.6

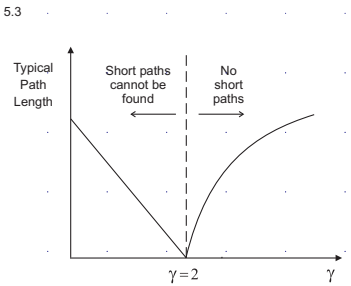


5.1



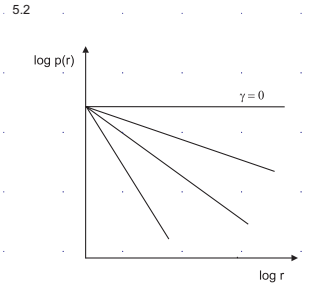


(a)



(b)

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



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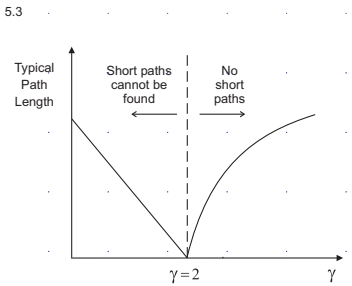
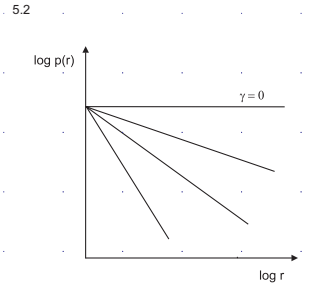


(b)

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



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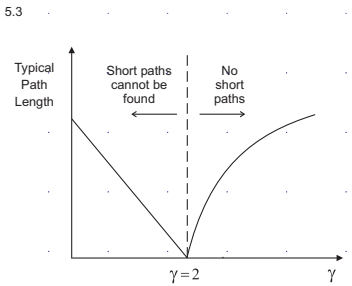


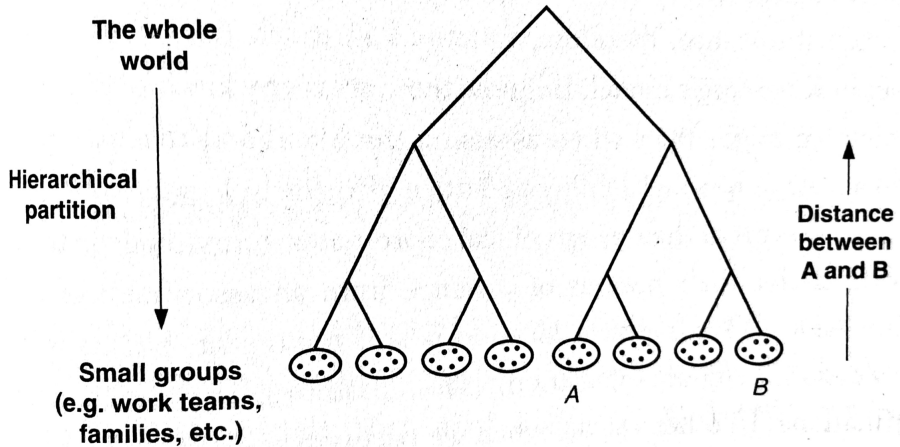
(b)

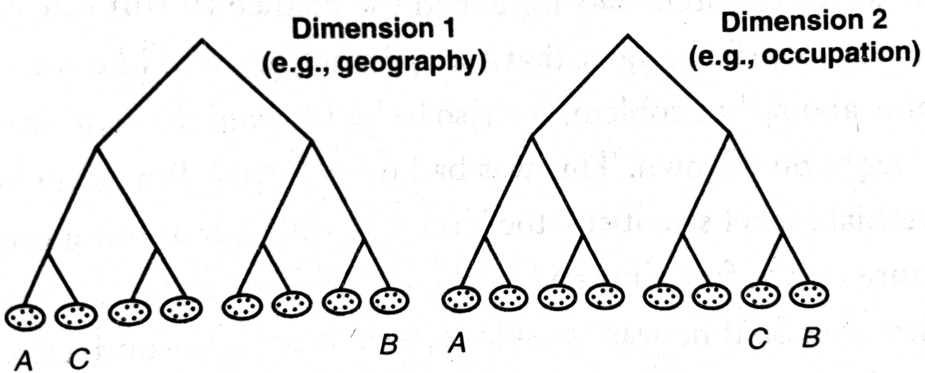
- low γ: lots of long connections, but networks not searchable
- $\gamma = 2$: same number of ties at all length scales, networks searchable
- high γ: no long connections, no short paths

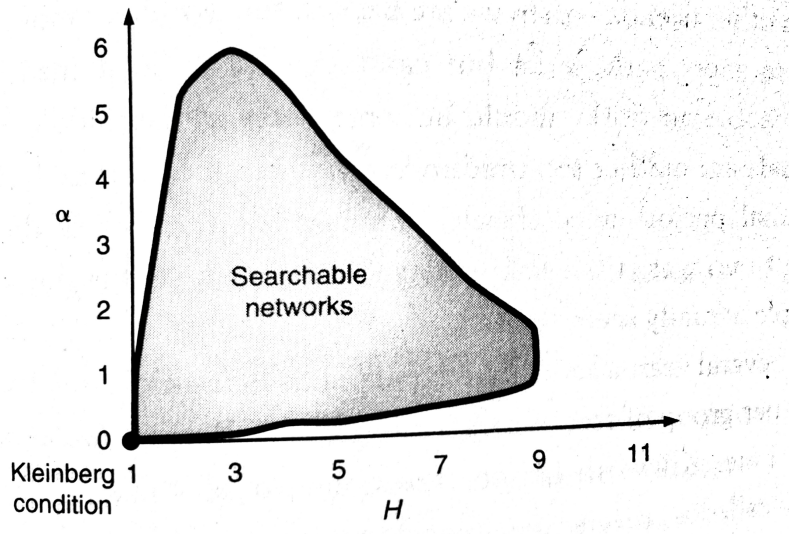
Navigation in a small world

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

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


The whole world
Hierarchical partition
Small groups (e.g. work teams, families, etc.)
A
B
Distance between A and B


Dimension 1
(e.g., geography)
A
C
B
Dimension 2
(e.g., occupation)
A
C
B

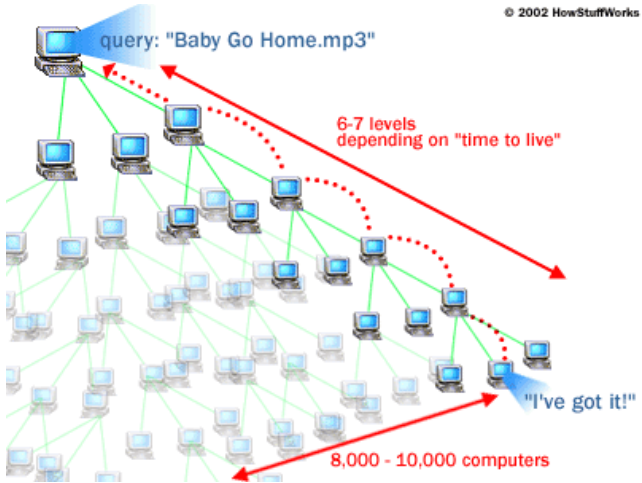


We will not define axes. Details of this model are not as important as the other models we have learned about.

Identity and Search in Social Networks

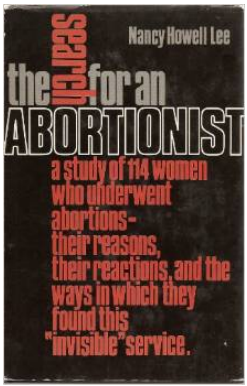
Duncan J. Watts,[1,2,3*] Peter Sheridan Dodds,[2] M. E. J. Newman[3]

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



http://computer.howstuffworks.com/file-sharing3.htm

Who cares about social search?


Nancy Howell Lee
the search for an
ABORTIONIST
a study of 114 women who underwent abortions - their reasons, their reactions, and the ways in which they found this "invisible" service.

You didn't read this, but here's some additional background information about study

- She took great care to protect the confidentiality of participants

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- She decided not to interview people with failed searches (and she talked about how this might impact her results)

You didn't read this, but here's some additional background information about study

- She took great care to protect the confidentiality of participants
- She decided not to interview people with failed searches (and she talked about how this might impact her results)
- She had to search for people who searched for an abortionist (and she talked about how this might impact her results)

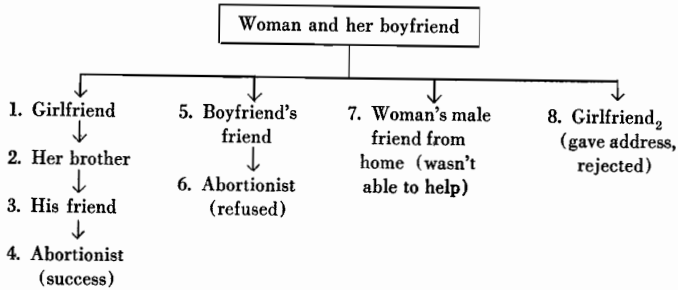

FIG. 2. Diagram of a search process—Example 1

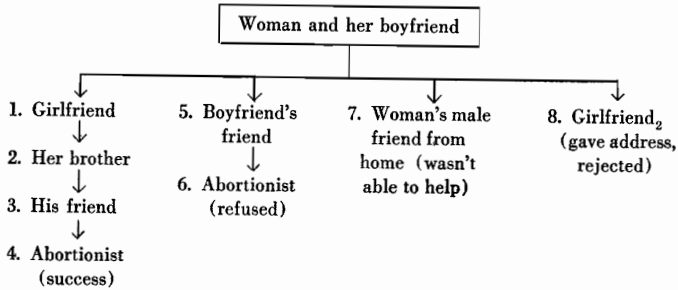

FIG. 2. Diagram of a search process—Example 1

Summary statistics:

- 8 people involved
- 4 fresh starts
- 4 links to abortionist (3 intermediaries)

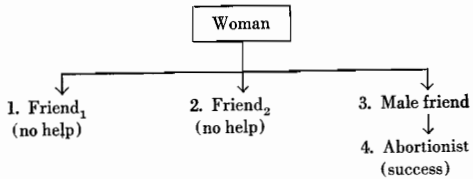

FIG. 3. Diagram of a search process—Example 2

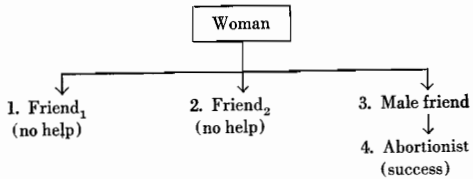

FIG. 3. Diagram of a search process—Example 2

Summary statistics:

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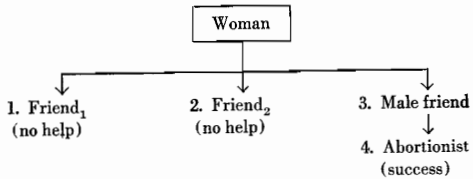


FIG. 3. Diagram of a search process—Example 2

Summary statistics:

- people involved: 4
- fresh starts:
- links to abortionist:

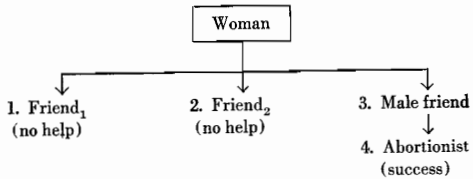


FIG. 3. Diagram of a search process—Example 2

Summary statistics:

- people involved: 4
- fresh starts: 3
- links to abortionist:

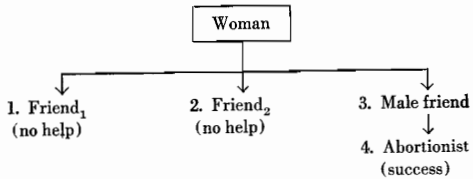


FIG. 3. Diagram of a search process—Example 2

Summary statistics:

- people involved: 4
- fresh starts: 3
- links to abortionist: 2

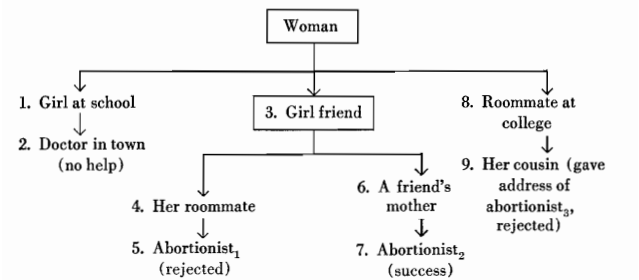
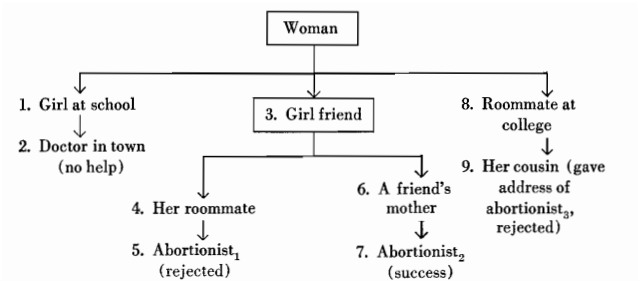


FIG. 4. Diagram of a search process—Example 3



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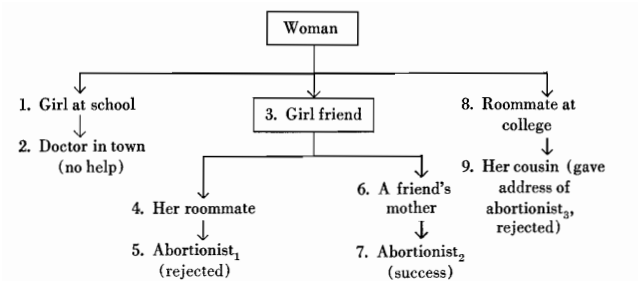
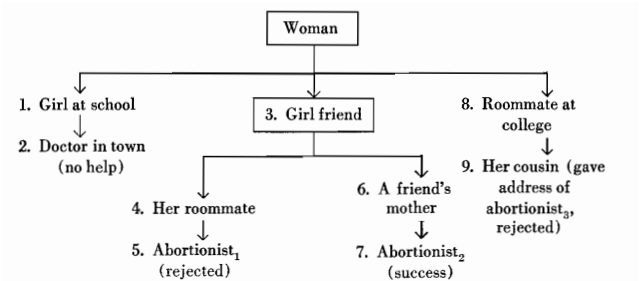


FIG. 4. Diagram of a search process—Example 3

Summary statistics:

- people involved: 9
- fresh starts:
- links to abortionist:



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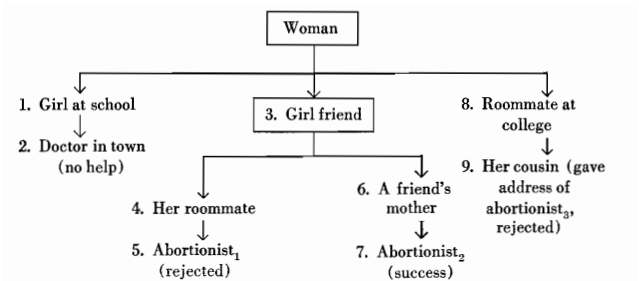

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TABLE 15

TOTAL NUMBER CONSULTED DURING THE SEARCH, BY NUMBER OF FRESH STARTS PER SEARCH

Number of Fresh Starts	Number of Persons Consulted									
	1	2	3	4	5	6	7	8	9+	Total
1	1	19	11	5	5	1	0	1	1	44
2		—	2	6	1	3	0	2	1	15
3			—	3	4	4	2	3	0	16
4				1	4	5	3	2	1	16
5					—	4	4	1	2	11
6						—	0	1	3	4
7							—	2	3	5
8								—	3	3
Total	1	19	13	15	14	17	9	12	14	114

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In 19 cases, the searchers contacted someone that lead her to an abortionist.

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About half the searches involved 6 or more people.

TABLE 17

LENGTH OF CHAIN THAT LED TO ABORTIONIST USED

Length of Chain (x)	N	Number of Persons in Successful Chains (x · N)	Cumulative Percent Who Reached Abortionist by Chain of x or Less
1	2	2	2
2	52	104	47
3	34	102	77
4	11	44	87
5	10	50	96
6	1	6	97
7	1	7	98
Total	111*	315	

Note: Median = 2.0; Mean = 2.83.

*Three women are omitted in this table: two induced their own abortions, and one successful chain was not adequately described.

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Chain length of 2 links was most common

TABLE 18

SOURCES OF SUCCESSFUL FRESH STARTS

Kinds of People	Number of Fresh Starts	Successful Fresh Starts	Percent Successful
Relatives			
Mother or parents	14	8	57
Sister, brother, or cousin	6	4	66
Other relatives	4	0	0
Friends			
Girl friends	102	23	23
Male friends	22	11	50
Older friends	8	4	50
Other friends	27	8	29
Relative of a friend, friend of a friend	22	1	5
Man involved in pregnancy	45	24	53
Doctors			
Personal physician	26	7	27
Psychiatrist	4	1	25
Doctor recommended by others	5	3	60
Doctor selected by chance	12	4	33
Other			
Abortionists	2	2	100
"Abortion specialist"	7	2	28
Acquaintances, met during search	16	7	44
Other	2	2	100
Total	324	111	

Weak ties might have access to new information but not always very effective, probably because of effort

Title:	Getting a Job: An Analysis of Networking Techniques used by Princeton Students in the Employment Market
Authors:	Ott, Gregory
Advisors:	Salganik, Matthew
Department:	Sociology
Class Year:	2013
Abstract:	Building off the work of Mark Granovetter and Nancy Howell Lee, this thesis observes the employment search networks of Princeton University seniors. I interviewed thirty-five students who were actively or had recently completed searches for employment and constructed visual representations of each student's search network. I found that students searching for employment in locations geographically close to home conduct more focused searches and students searching for employment in industries requiring specific technological or scientific knowledge or skill conducted shorter, more efficient searches. I also found evidence supporting Granovetter's 1973 hypothesis regarding the strength of weak ties, as Princeton students use far more weak ties in searches for employment. All students used impersonal methods of communication most frequently, but also indicated the power of personal methods of communication.

- small world experiments show both 1) short paths exist and 2) people can find them with local information

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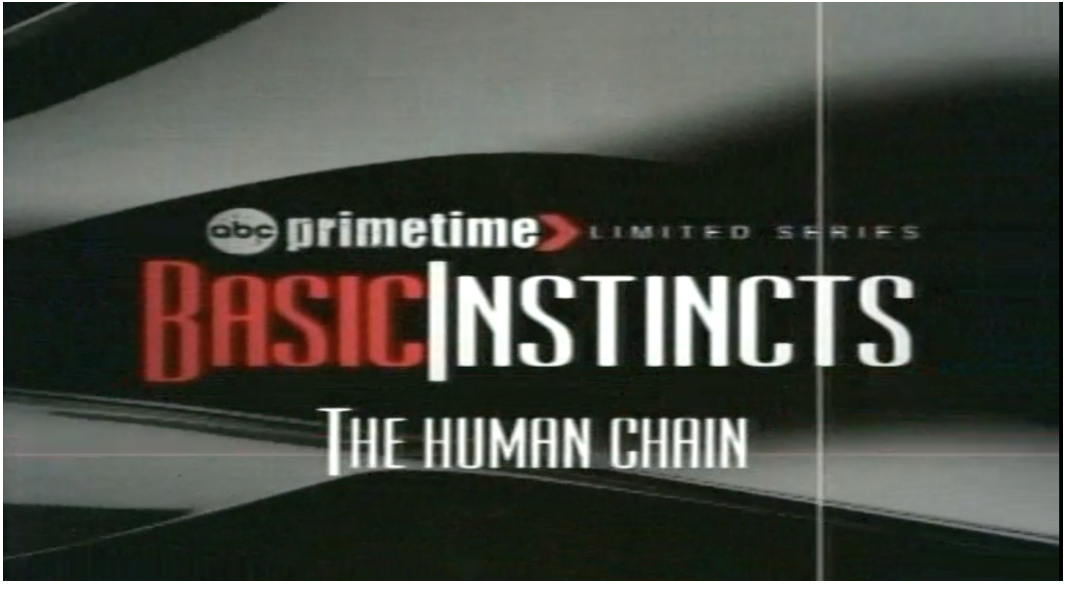
- new models explain why social networks might be searchable and how to design searchable networks

- small world experiments show both 1) short paths exist and 2) people can find them with local information
- new models explain why social networks might be searchable and how to design searchable networks
- examples of directed searches in networks with real consequences

Turning point in the class:
Network structure $\rightarrow$ dynamics on networks



https://princeton.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=81548be9-81d7-48c0-88cd-ad1000ee46ac

Feedback: `http://bit.ly/soc204-2021`

Next class

- Watts, Chapter 6.
- Bearman, P.S., Moody, J.M., and Stovel, K. (2004). Chains of affection: The structure of adolescent romantic and sexual networks. *American Journal of Sociology*.