
Network Interventions & Policy Considerations

CRJ 523

Network Criminology

Learning Goals

- ❖ Understand the logic of **network interventions** and the various approaches.
- ❖ Discuss various principles of **network interventions**.

Network Interventions

- ❖ Throughout the semester we have studied *whether* and *how* networks matter.
- ❖ Knowing that network structure matters, what can you do about it?
 - ❖ **Network Interventions**

Network Interventions

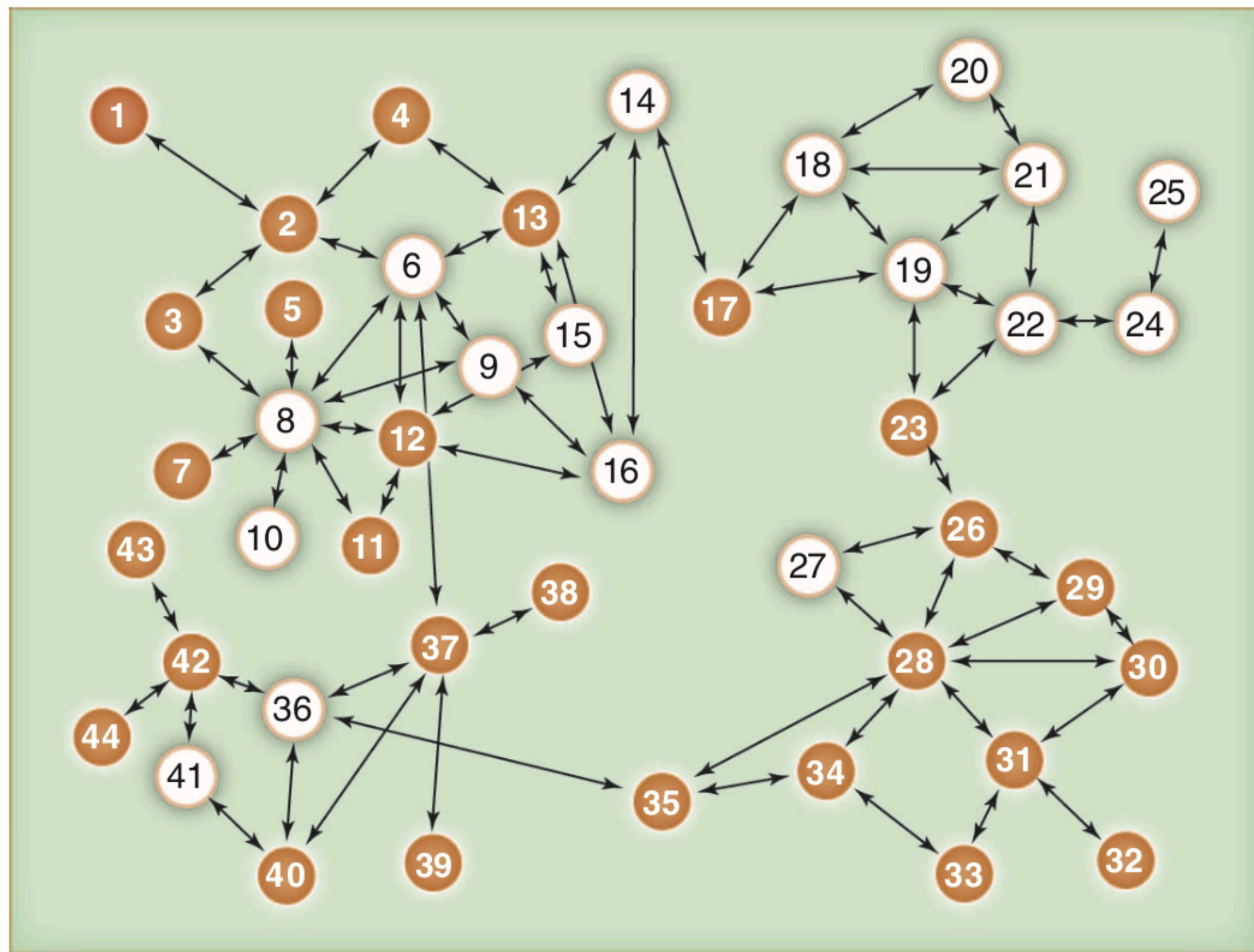
- ❖ [Valente \(2012\)](#)

- ❖ What are *network interventions*?

- ❖ p. 49: “Network interventions are purposeful efforts to use social networks or social network data to generate social influence, accelerate behavior change, improve performance, and / or achieve desirable outcomes among individuals, communities, organizations, or populations.”

- ❖ Network Interventions are build on the logic of “diffusion”: the “networks as pipes” metaphor.

Network Interventions



Network Interventions

- ❖ You all have just lived through one of the biggest network interventions in history...

Network Interventions

- ❖ You all have just lived through one of the biggest network interventions in history...
- ❖ Social distancing

Network Interventions

- ❖ [Valente \(2012\)](#)

- ❖ p. 49 “Though diffusion and other mechanisms of social influence explain the process of change, they do not provide guidance on how to use that information to accelerate change.”
- ❖ Provides four strategies:
 - ❖ Identifying individuals
 - ❖ Segmentation
 - ❖ Induction
 - ❖ Alteration

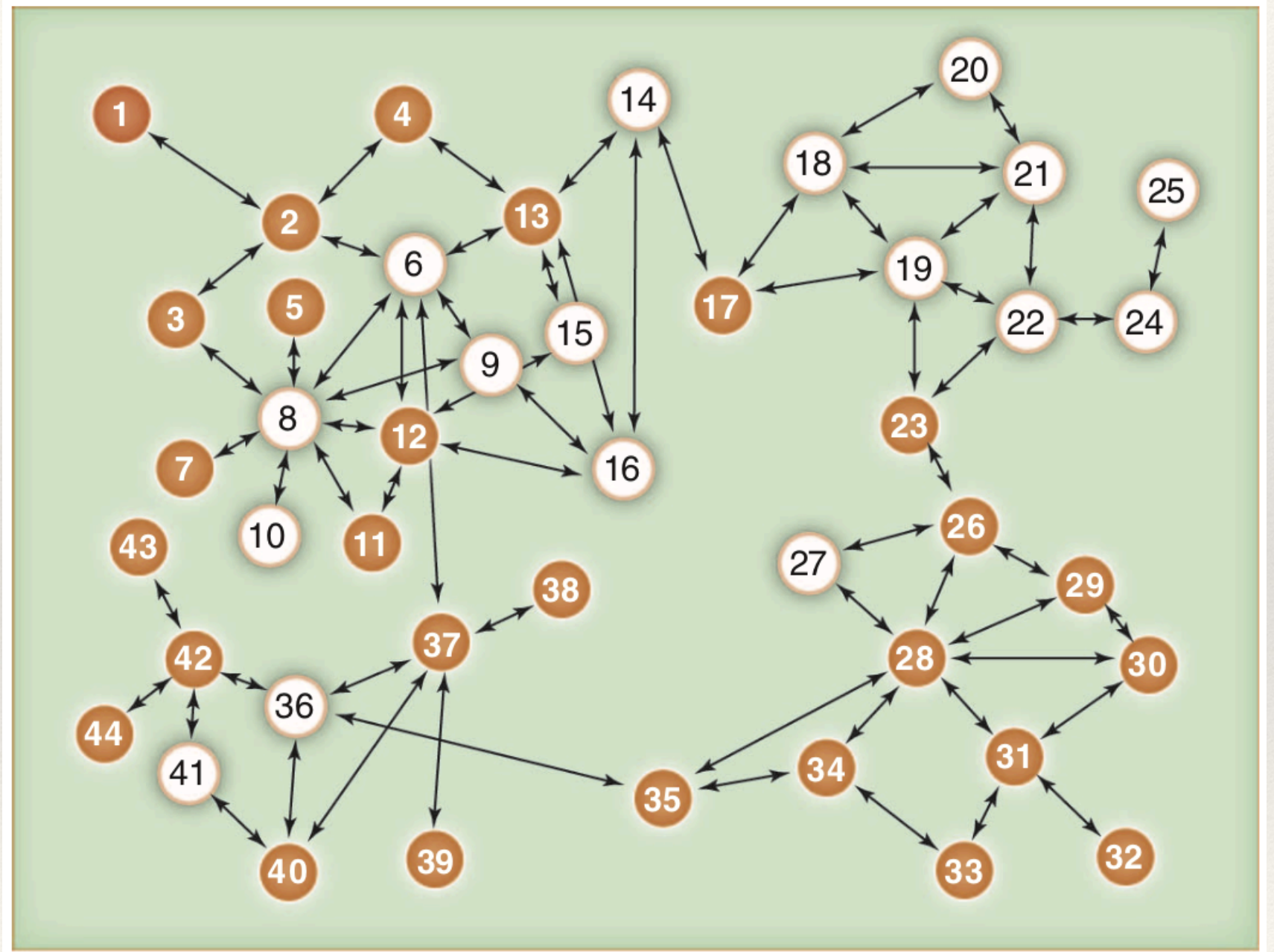
Identifying Individuals

- ❖ Identifying influential individuals to “champion” the intervention.

Identifying Individuals

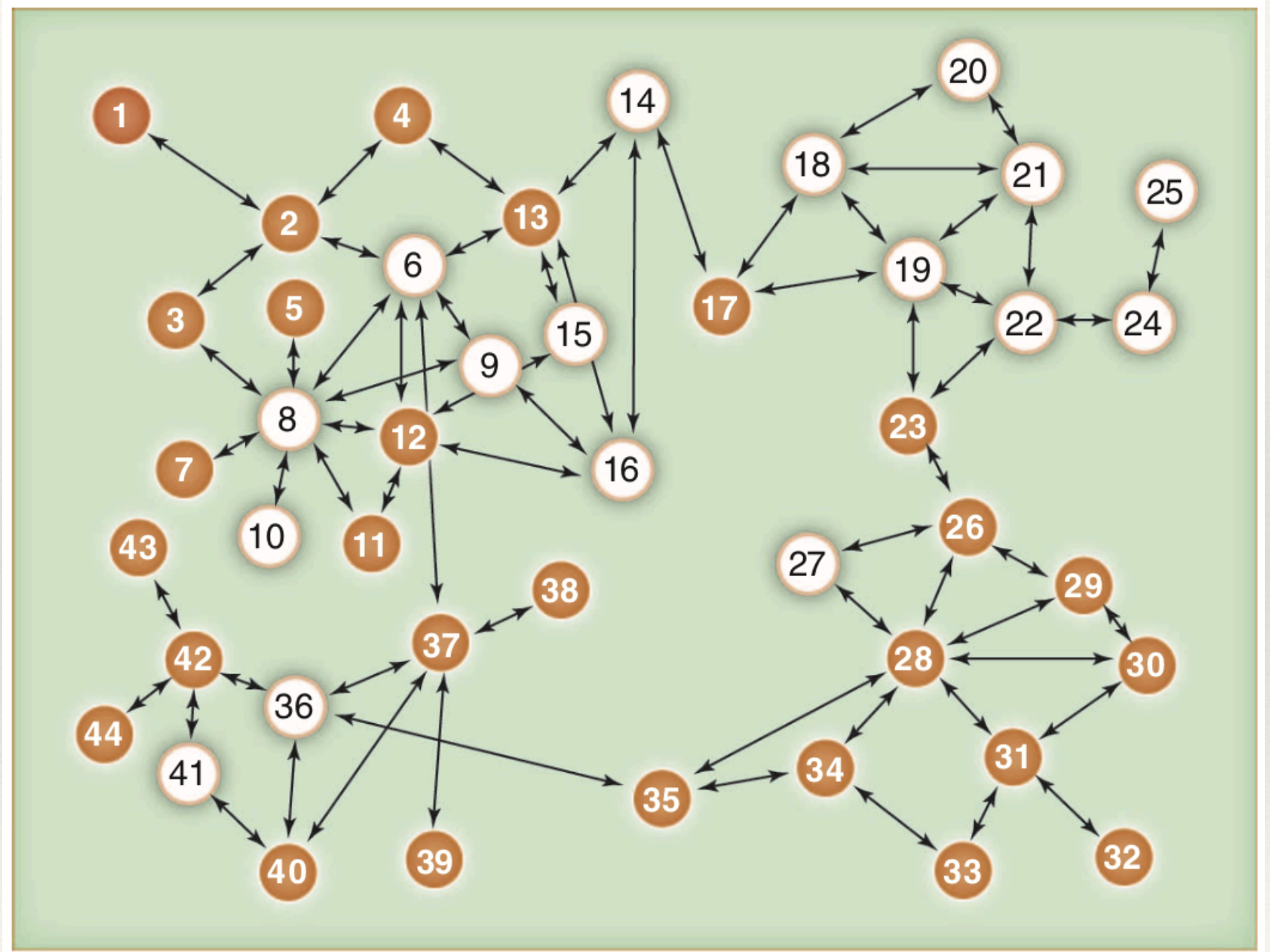
Who are the
influential
individuals?

Why do you say
so?



Identifying Individuals

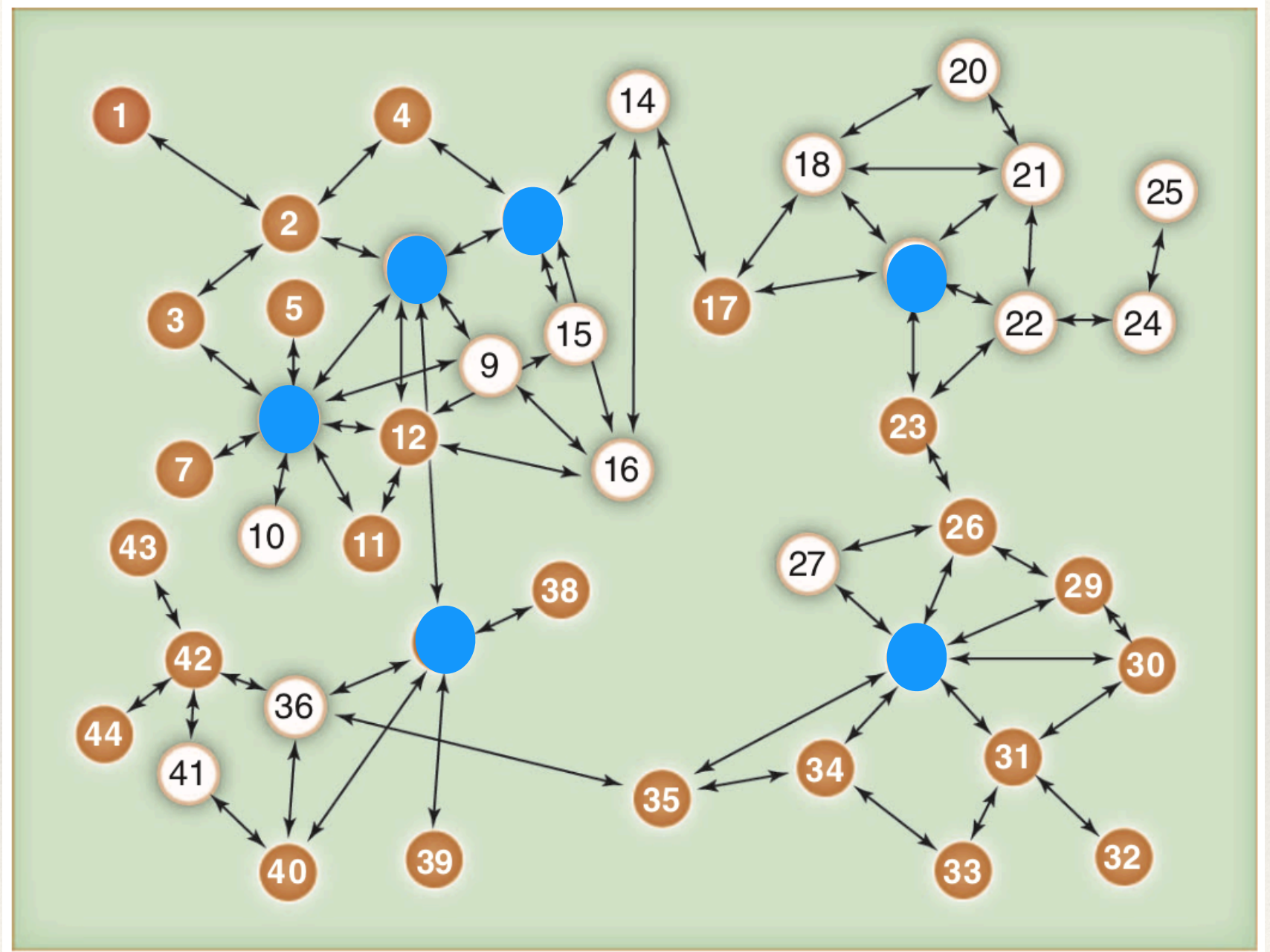
Depends on
what you mean
by “influential”



Identifying Individuals

Take those with
the most ties...

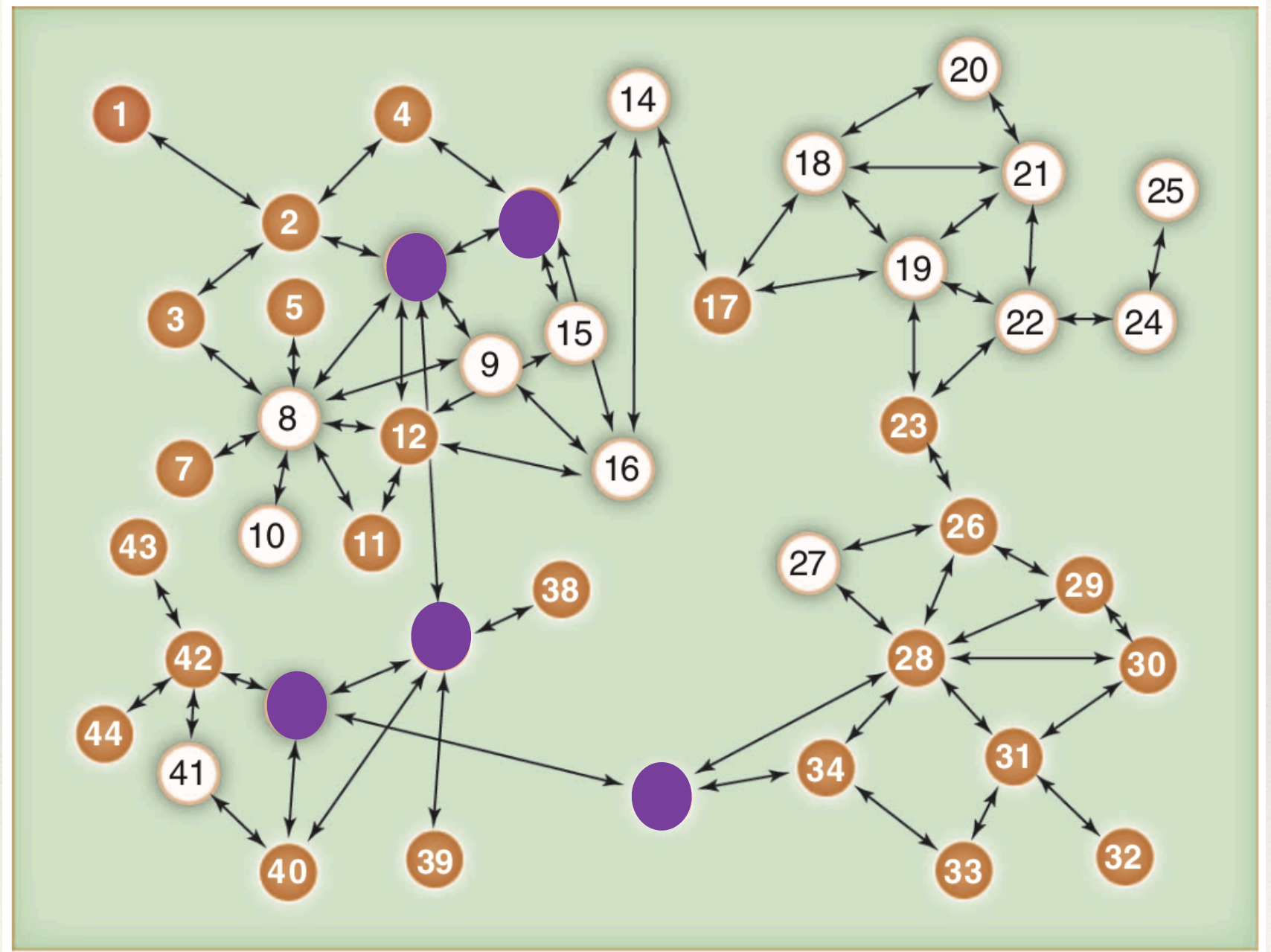
*Degree
centrality*



Identifying Individuals

Take those who
are close to
others....

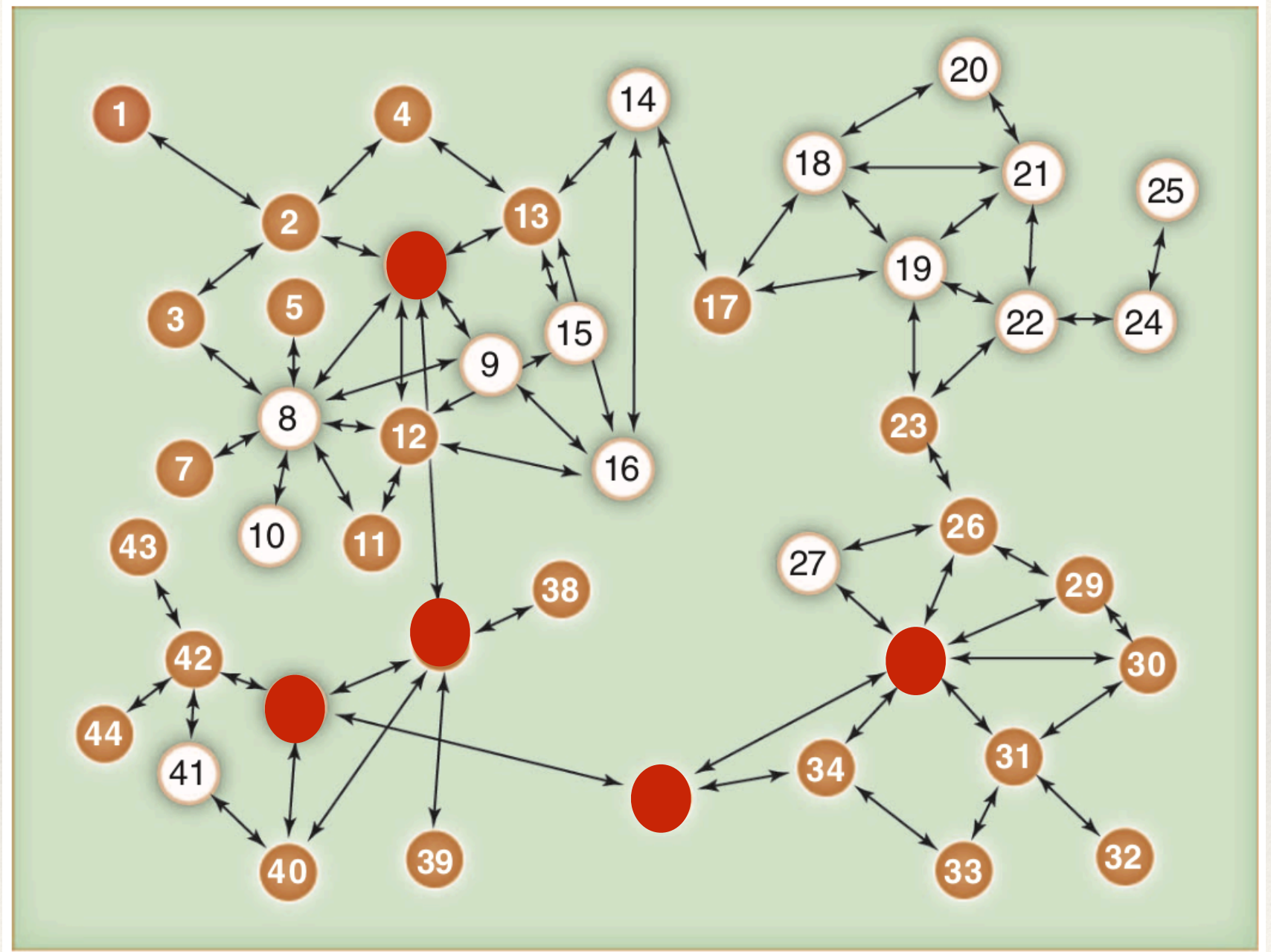
*Closeness
centrality*



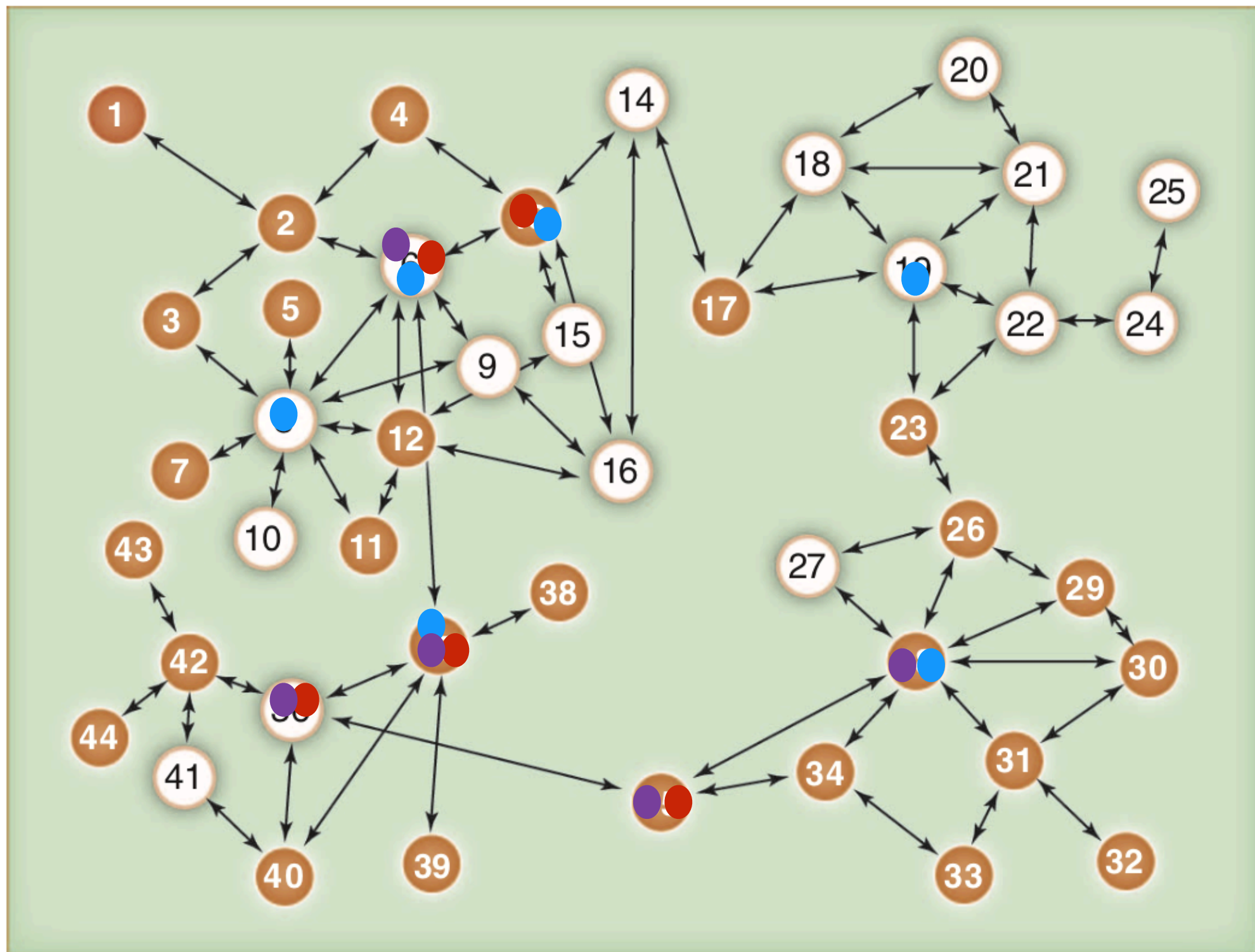
Identifying Individuals

Take those who
are between
people....

*Betweenness
centrality*



Identifying Individuals



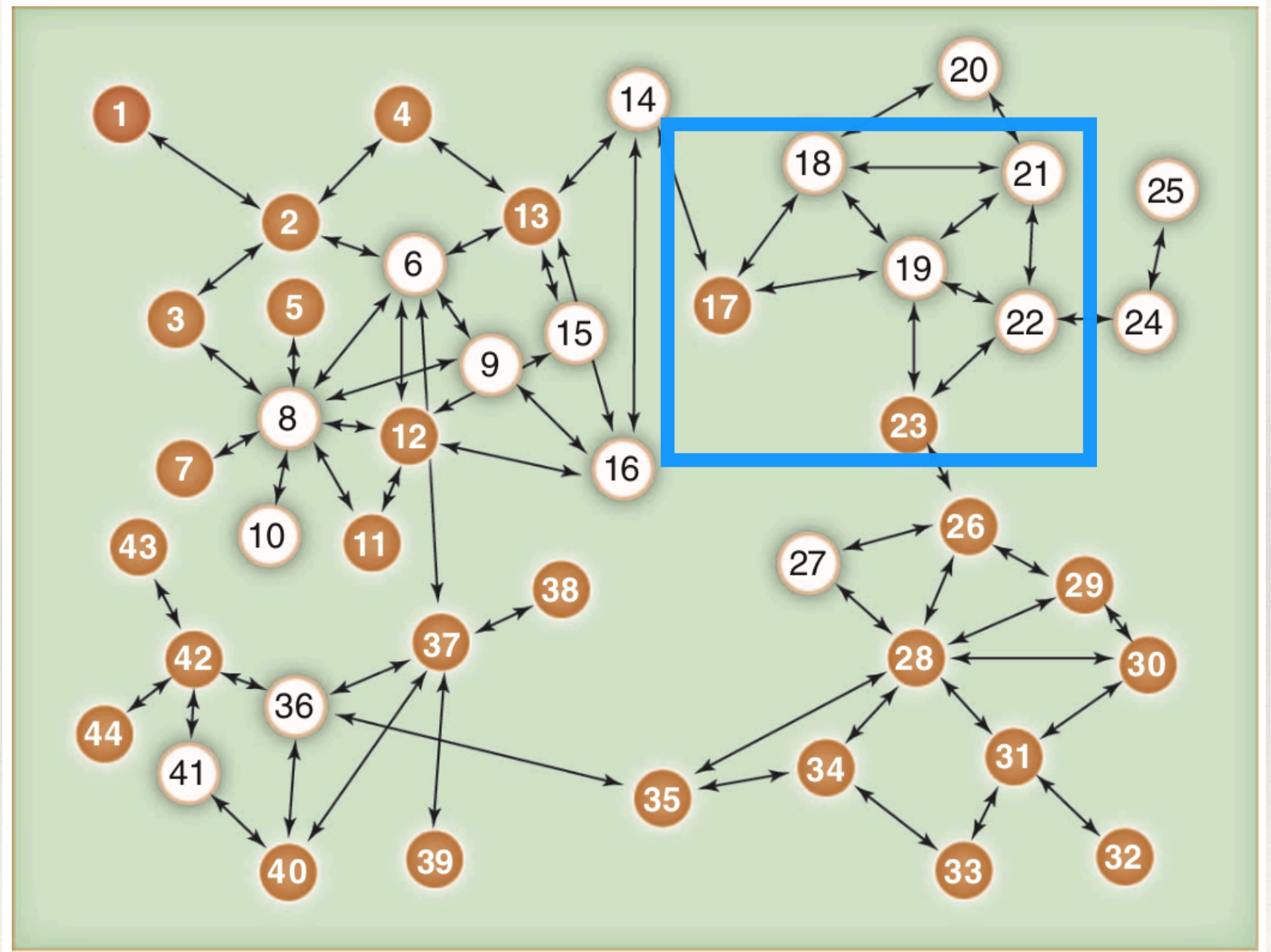
Identifying Individuals

- ❖ Identifying people based on having a “low-threshold” of change.

Identifying Individuals

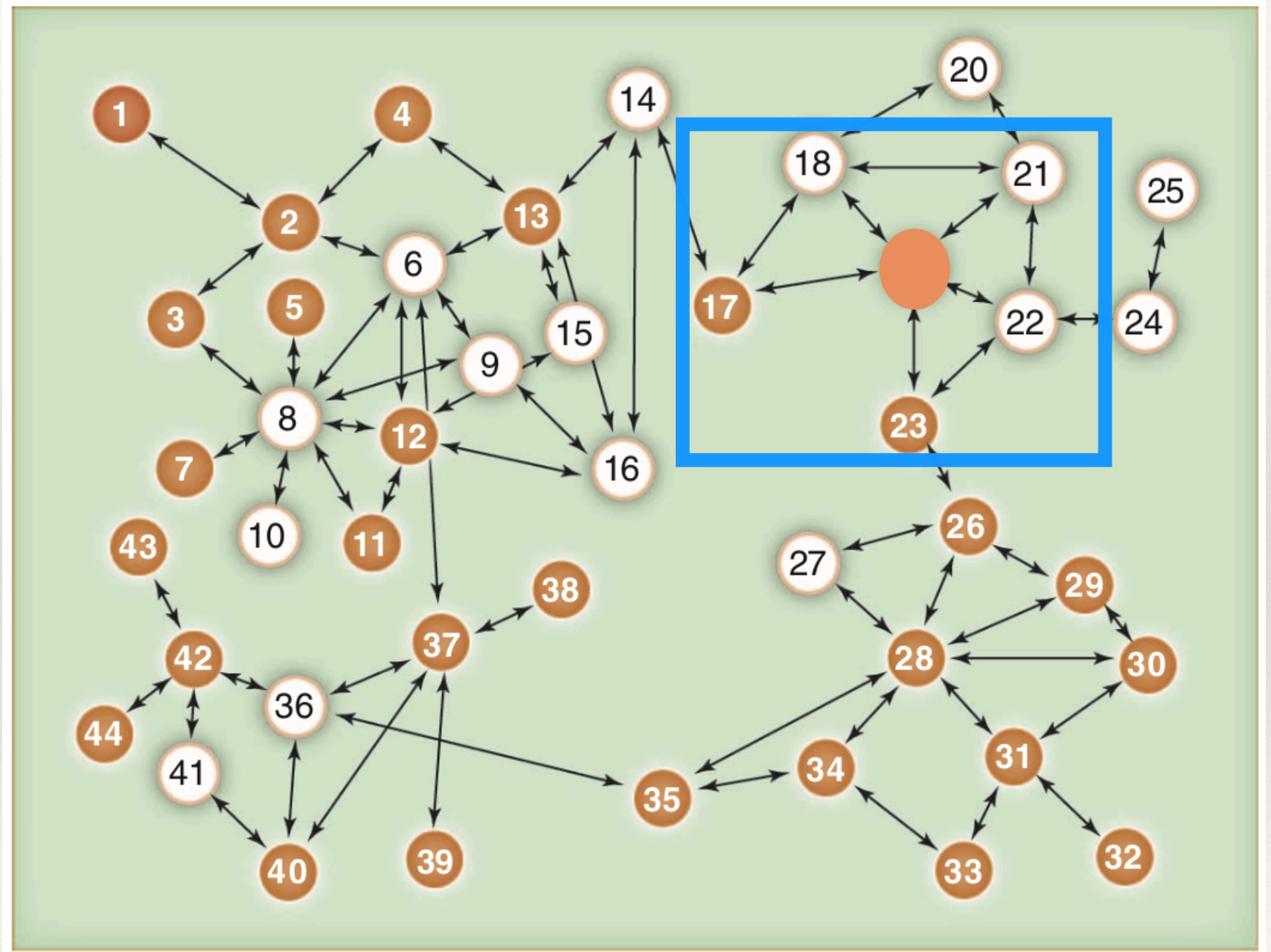
19 has 5 ties:

3 non-adopters
and 2 adopters.



Identifying Individuals

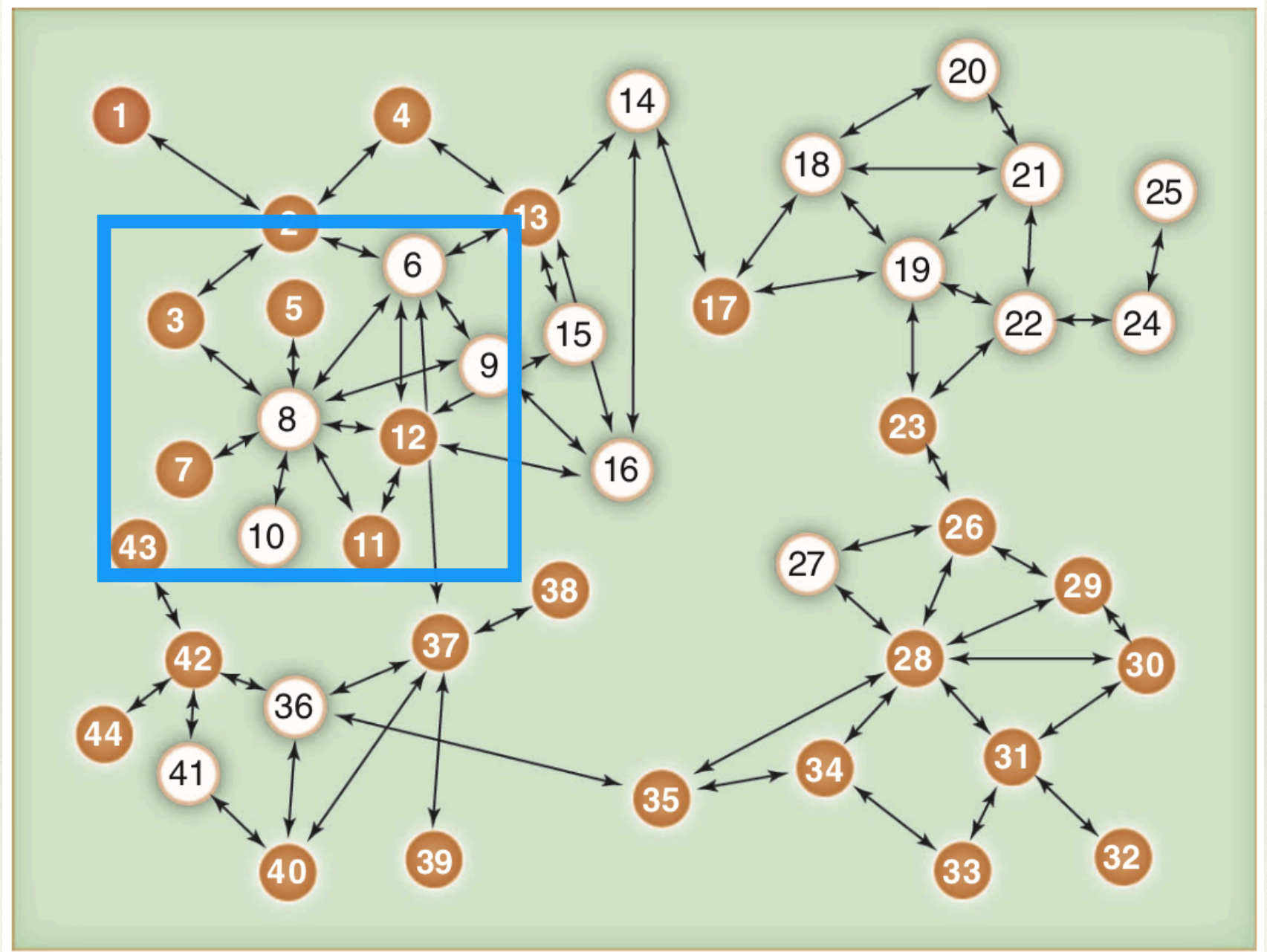
If 19 adopts,
then he/she had
an adoption
threshold of
40% (i.e. 2/5).



Identifying Individuals

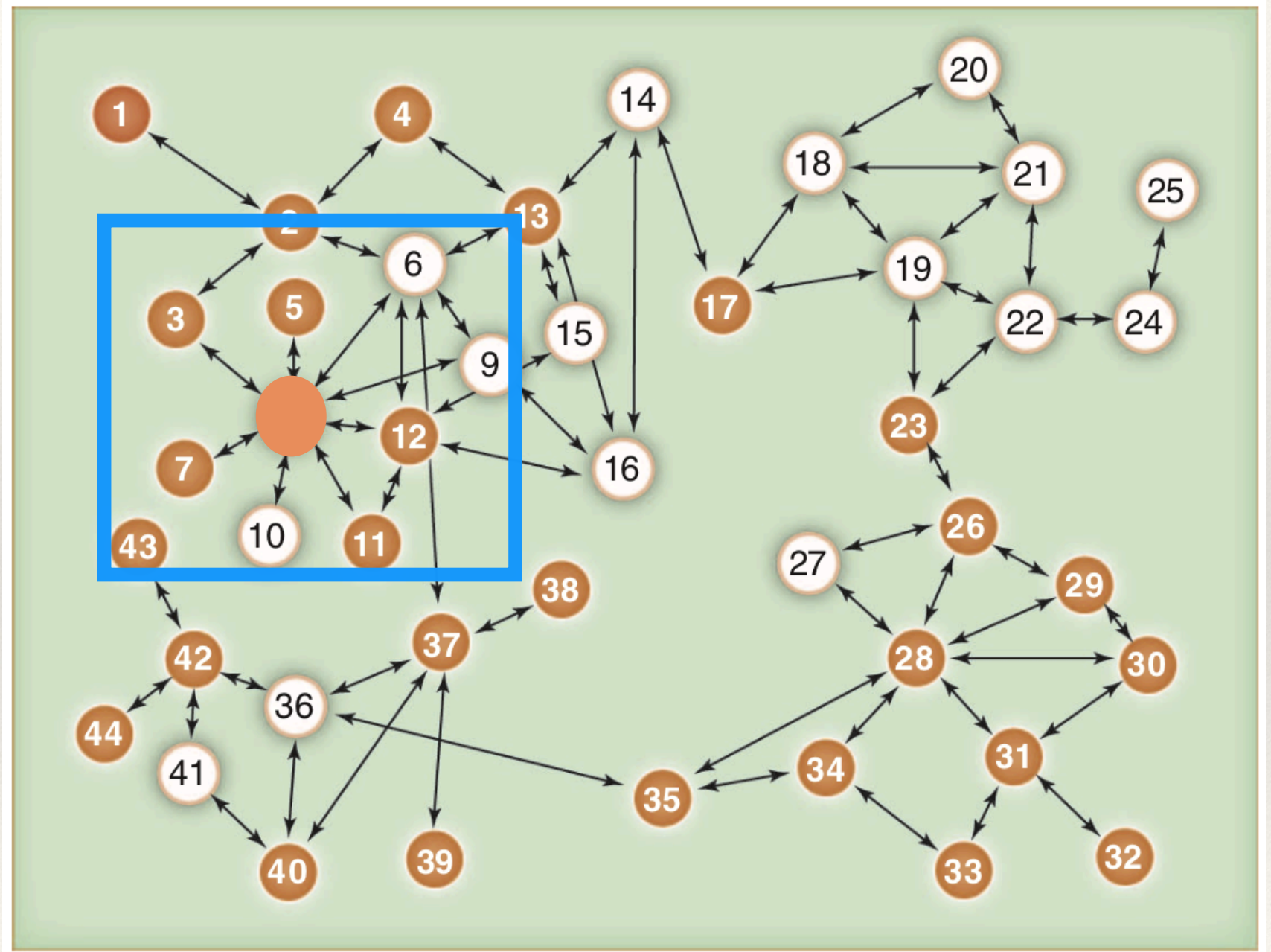
8 has 8 ties:

5 non-adopters
and 3 adopters.



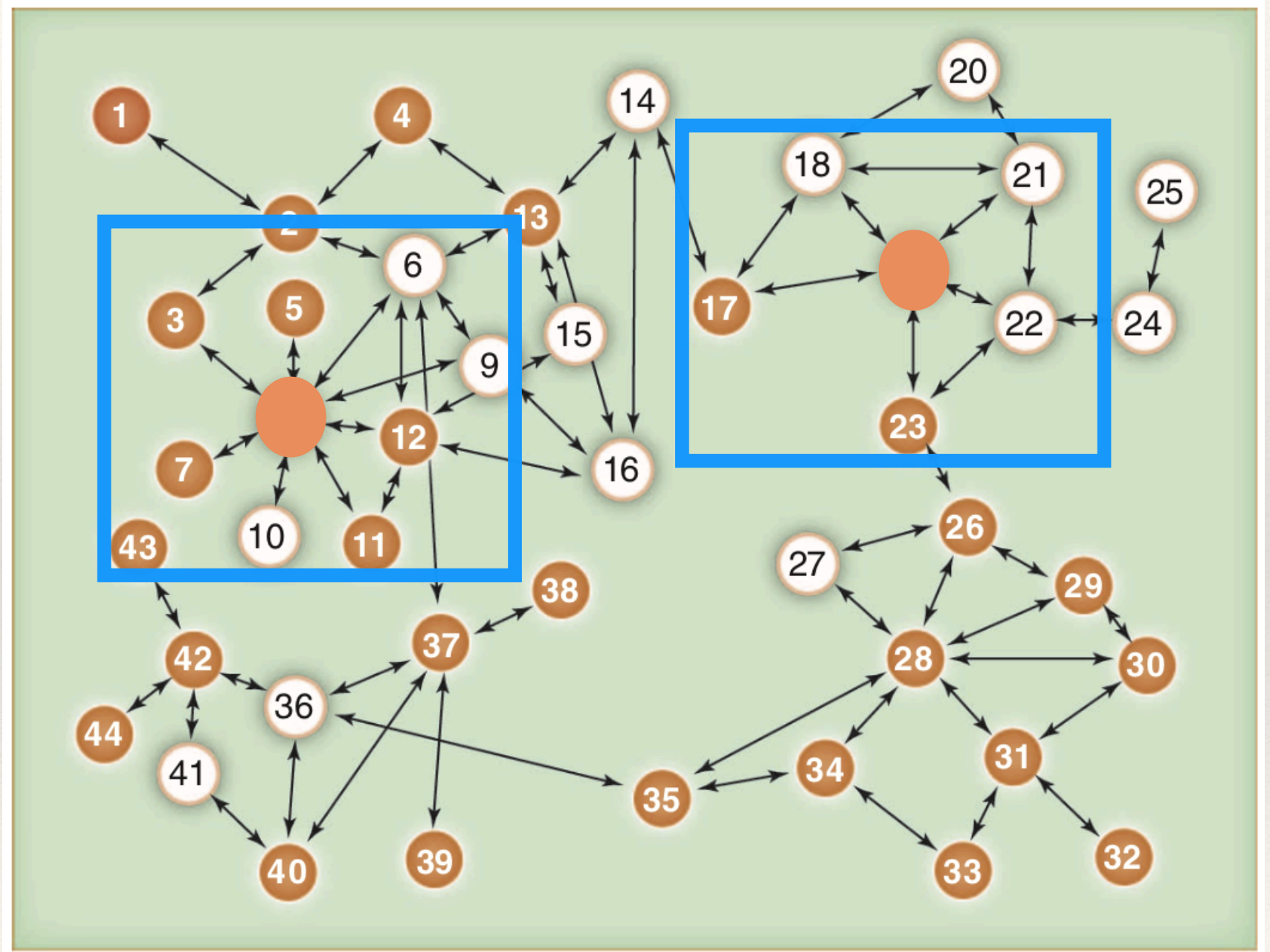
Identifying Individuals

If 8 adopts, then
he/she had an
adoption
threshold of
62% (i.e. 5/8).



Identifying Individuals

The lower adoption threshold for 19 vs. 8 may make diffusion spread faster.

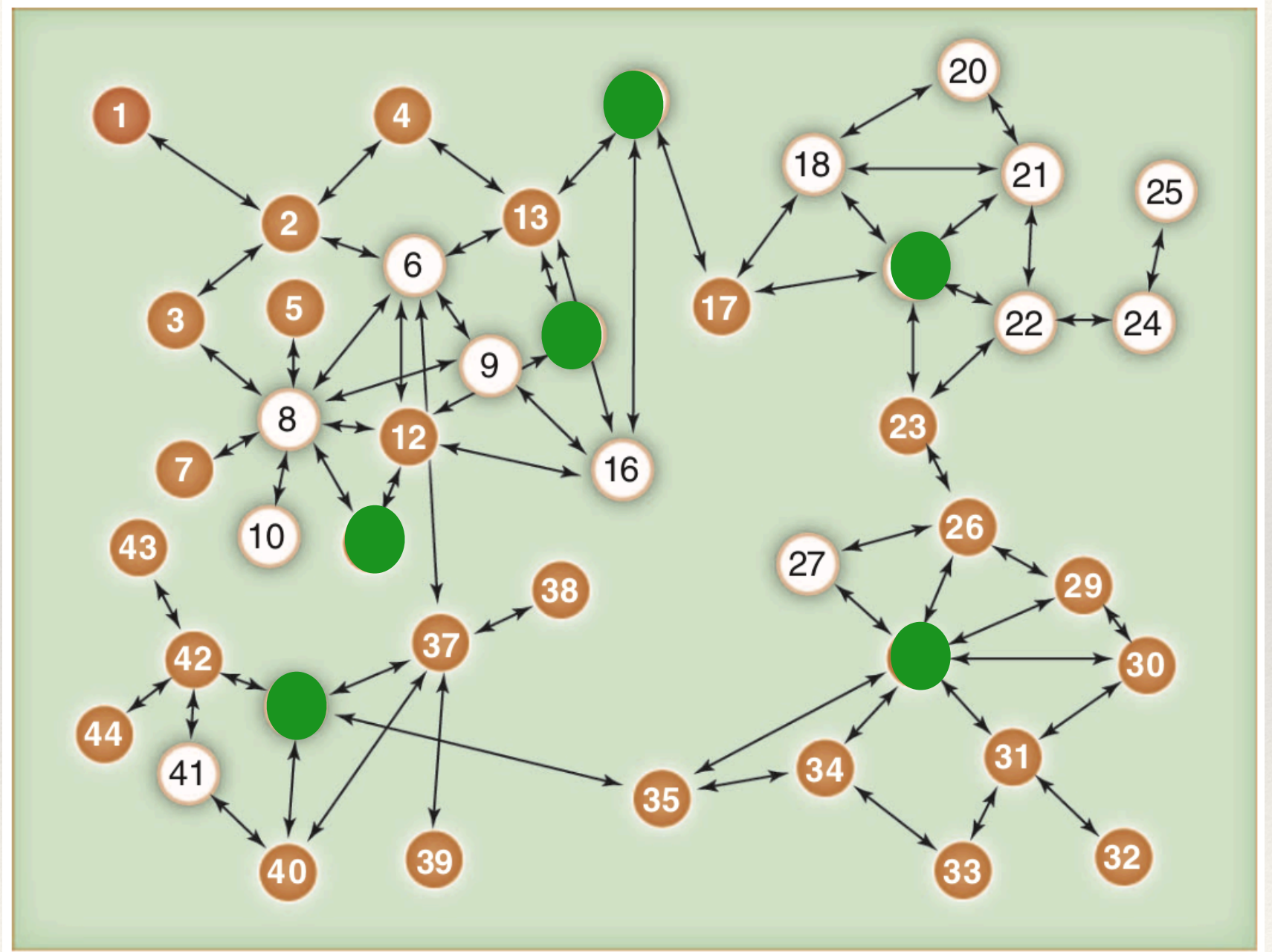


Segmentation

- ❖ Rather than targeting specific individuals, identify groups of people.
- ❖ Some interventions may require everyone to be involved.
- ❖ Some may require different design for different groups.

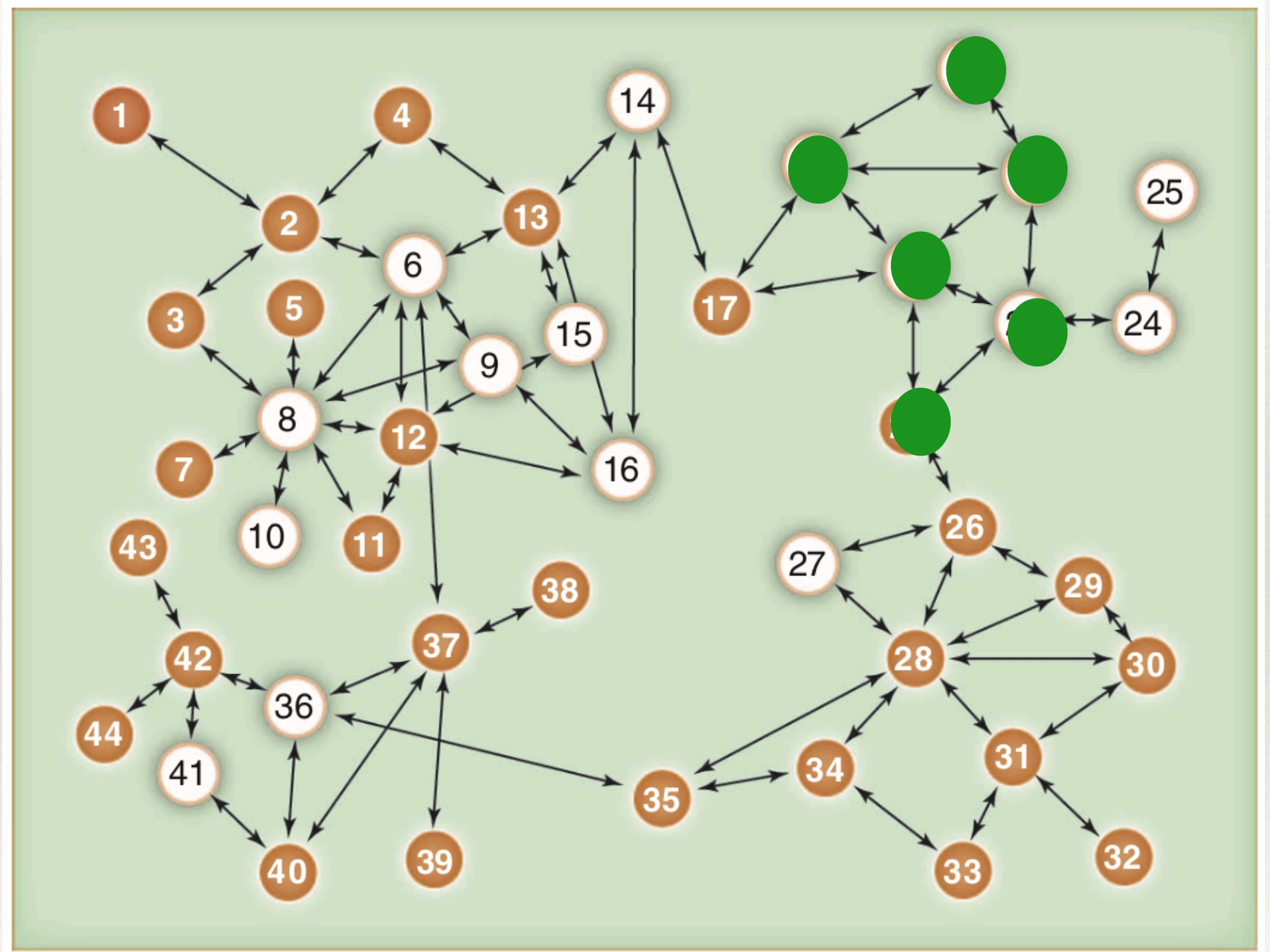
Segmentation

This might not
work....



Segmentation

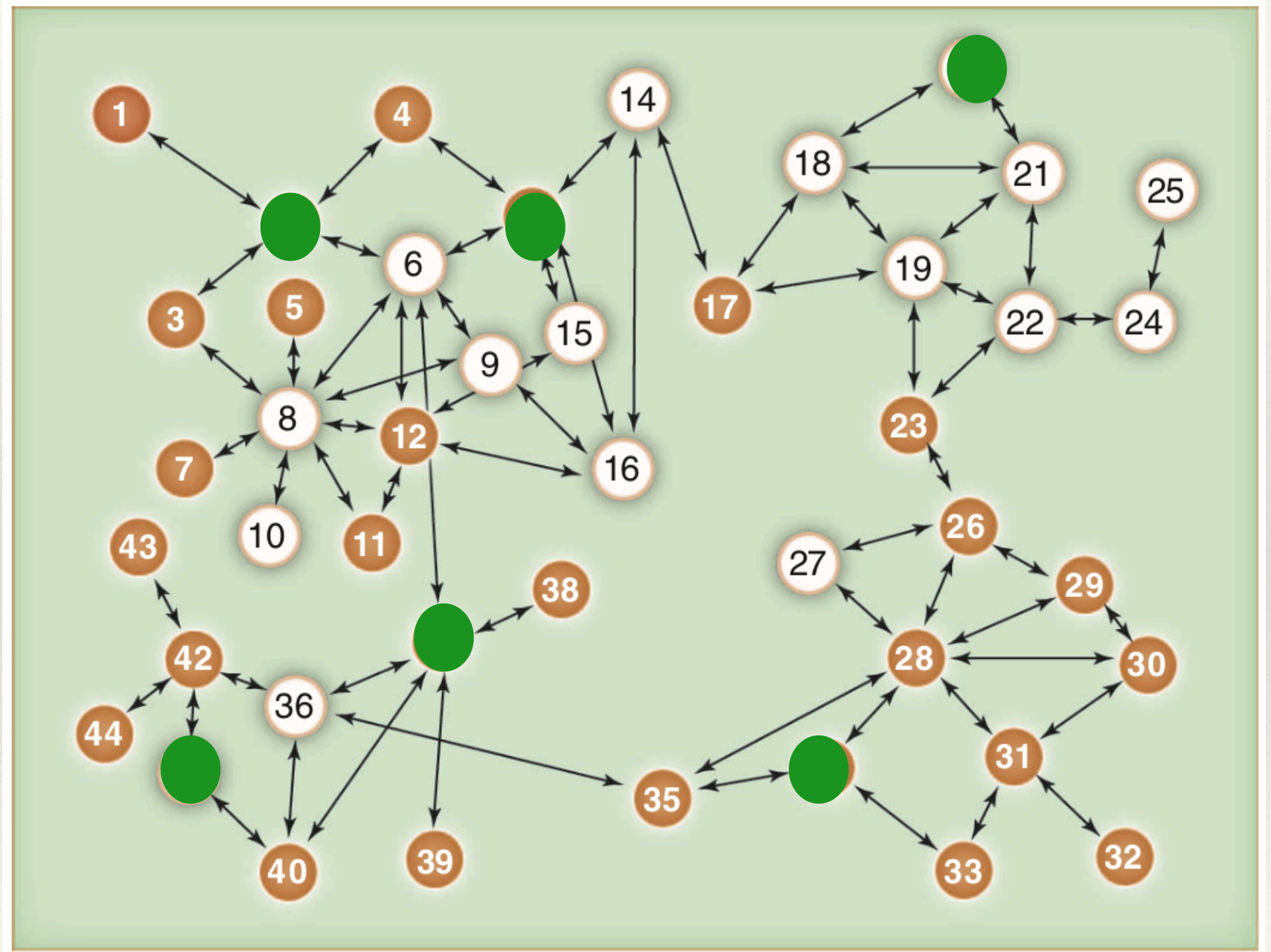
But this might...



Segmentation

Example:
Social
Distancing

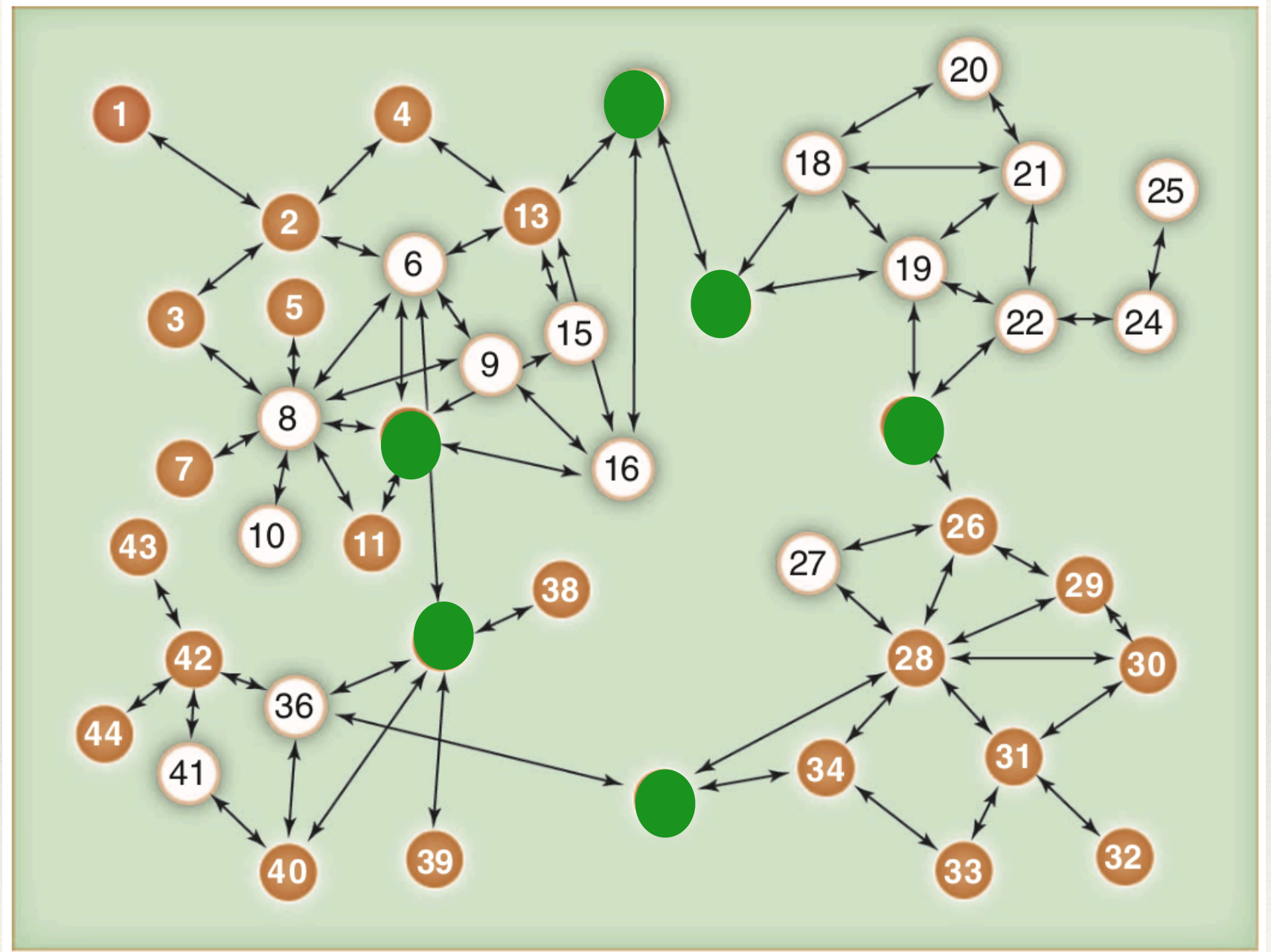
Does this
structure work?



Segmentation

Example:
Social
Distancing

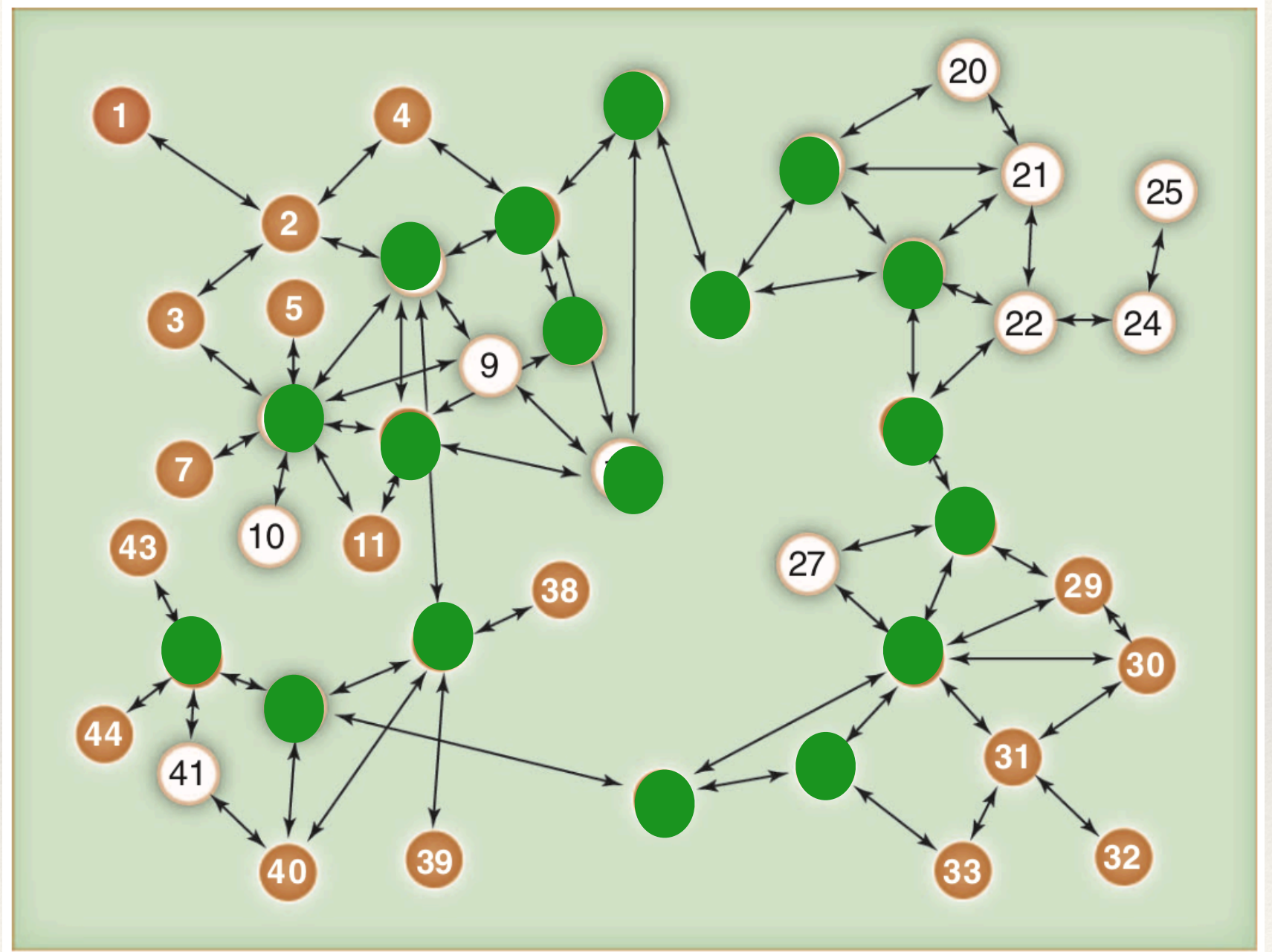
Does this
structure work?



Segmentation

Example:
Social
Distancing

Does this
structure work?

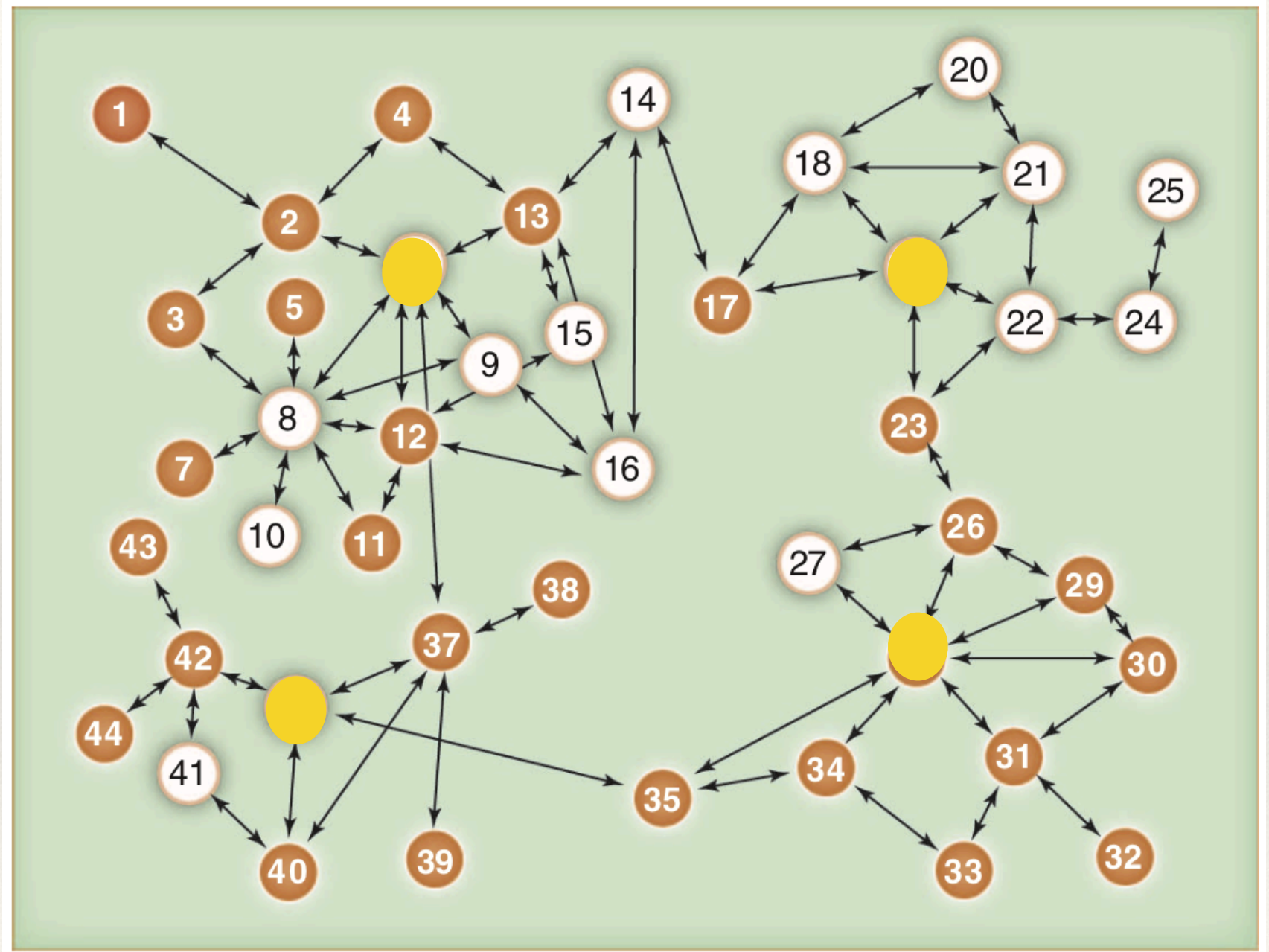


Induction

- ❖ Use existing ties to spread the innovation.
- ❖ Word of mouth and active recruitment.

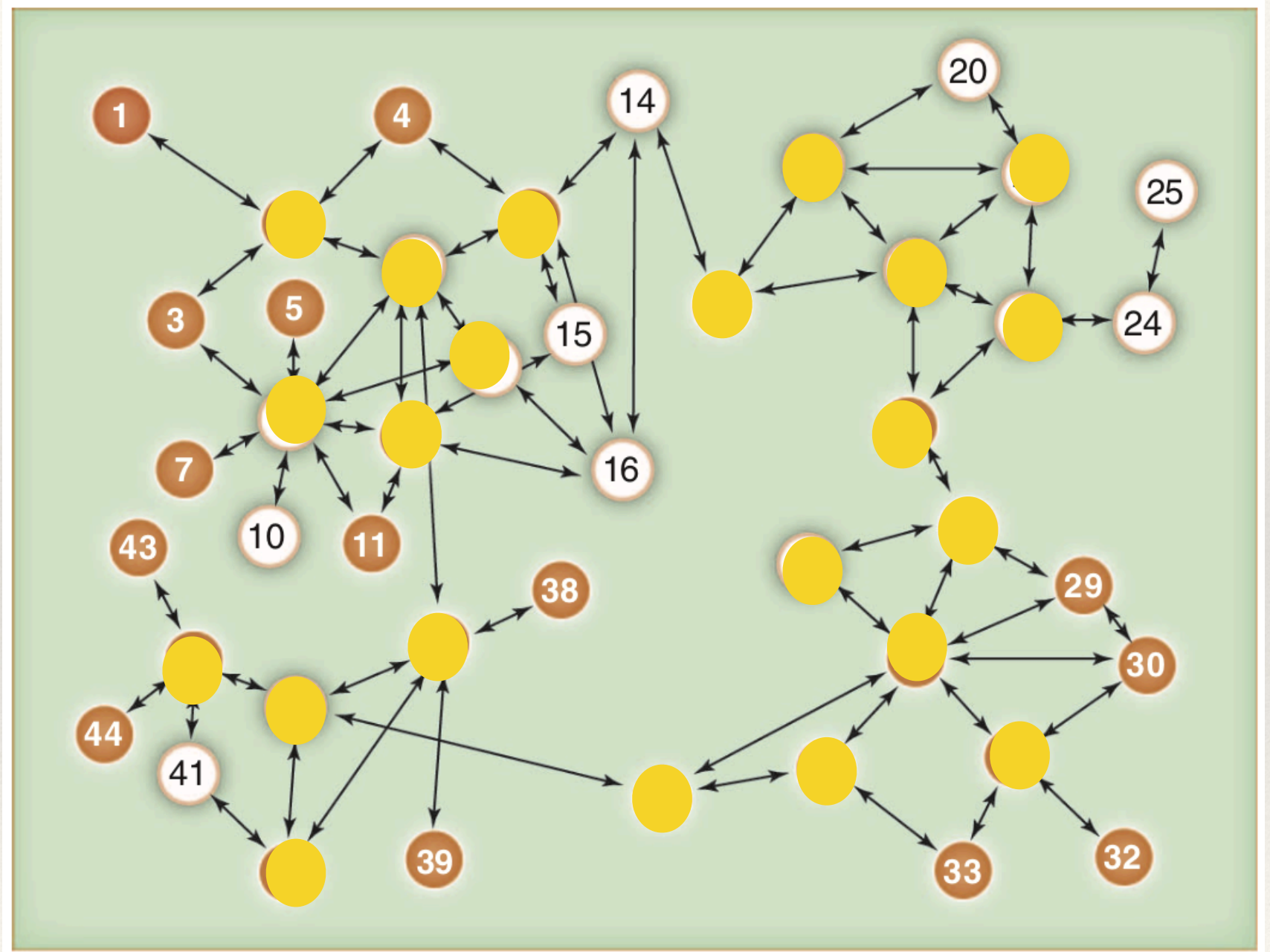
Induction

Here is a trial
version of this
product...



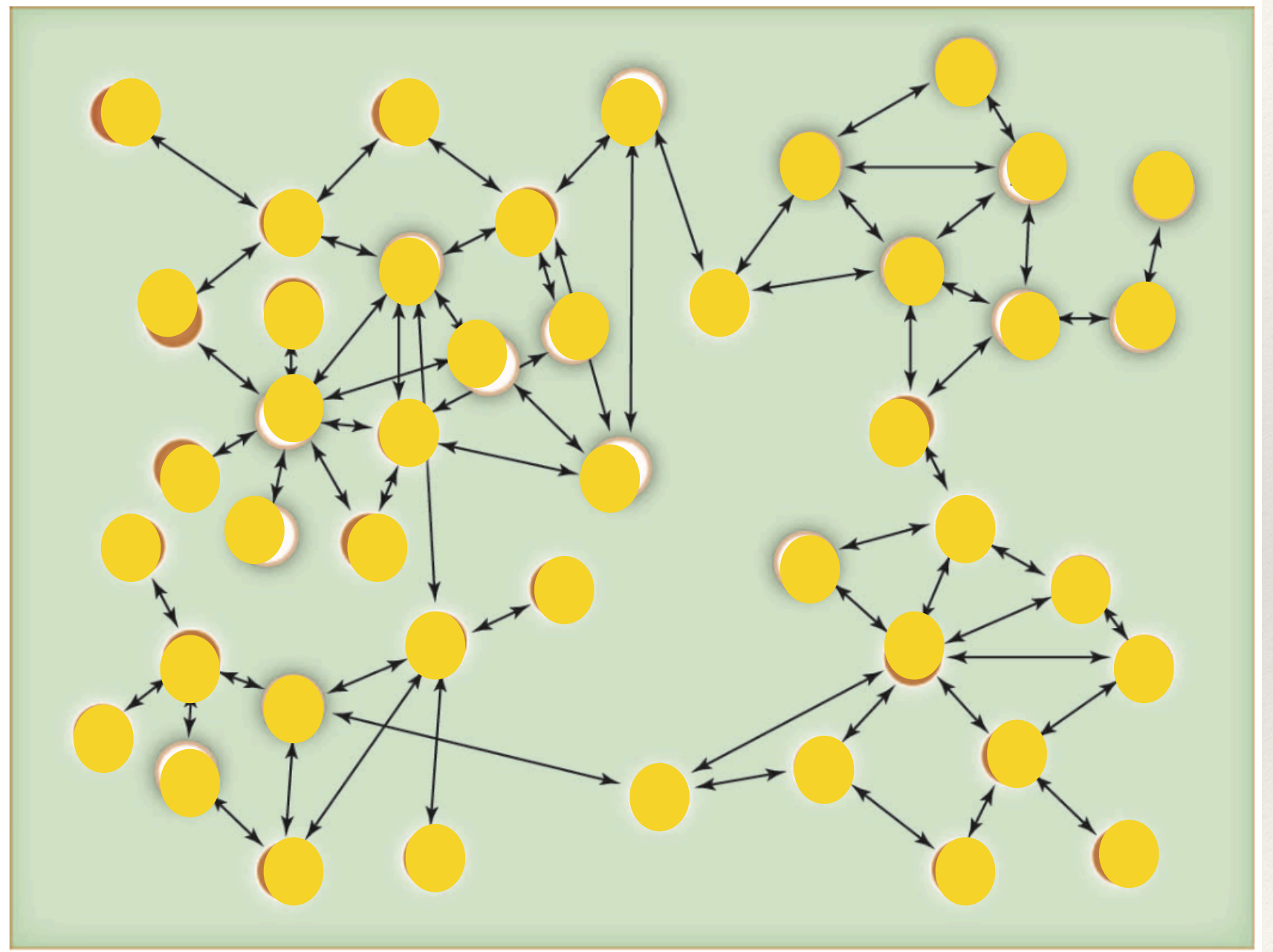
Induction

Tell your friends
and they can
activate their
trial version as
well...



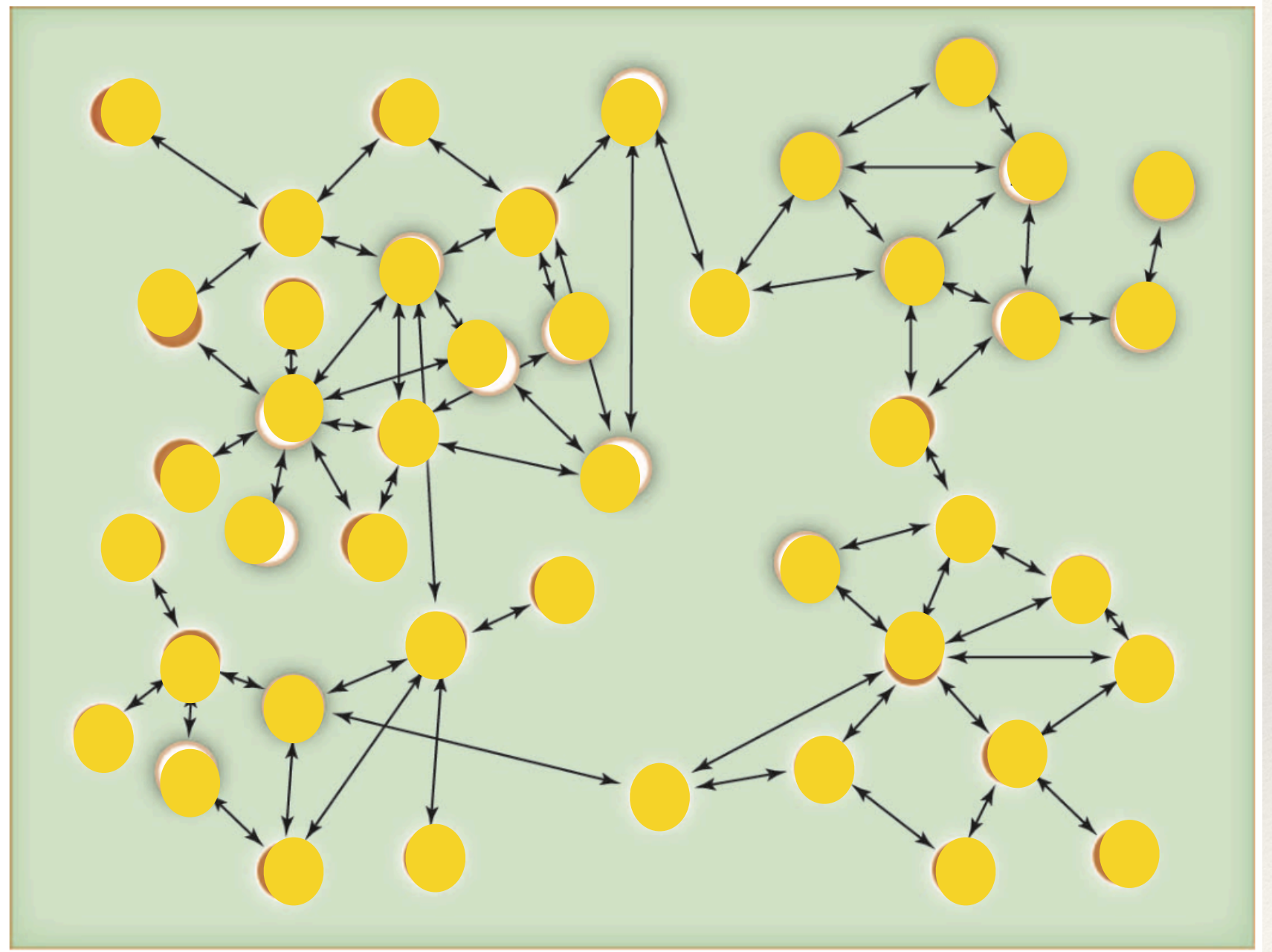
Induction

Tell them to tell
their friends...



Induction

This looks like
viral spread.



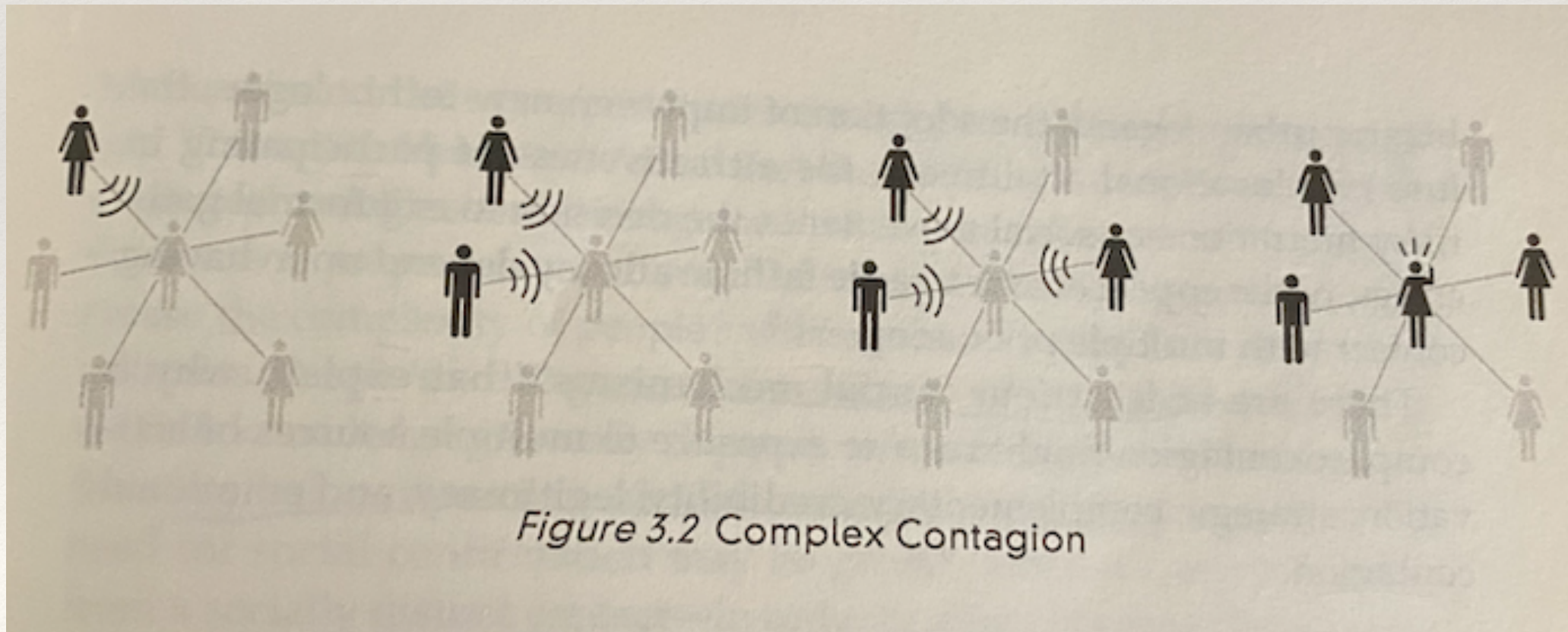
How Behavior Spreads

- ❖ Centola (2018)
 - ❖ Research on diffusion assumes a **viral** model of transmission:
 - ❖ A single exposure, and you get it.
 - ❖ Weak ties facilitate spread.



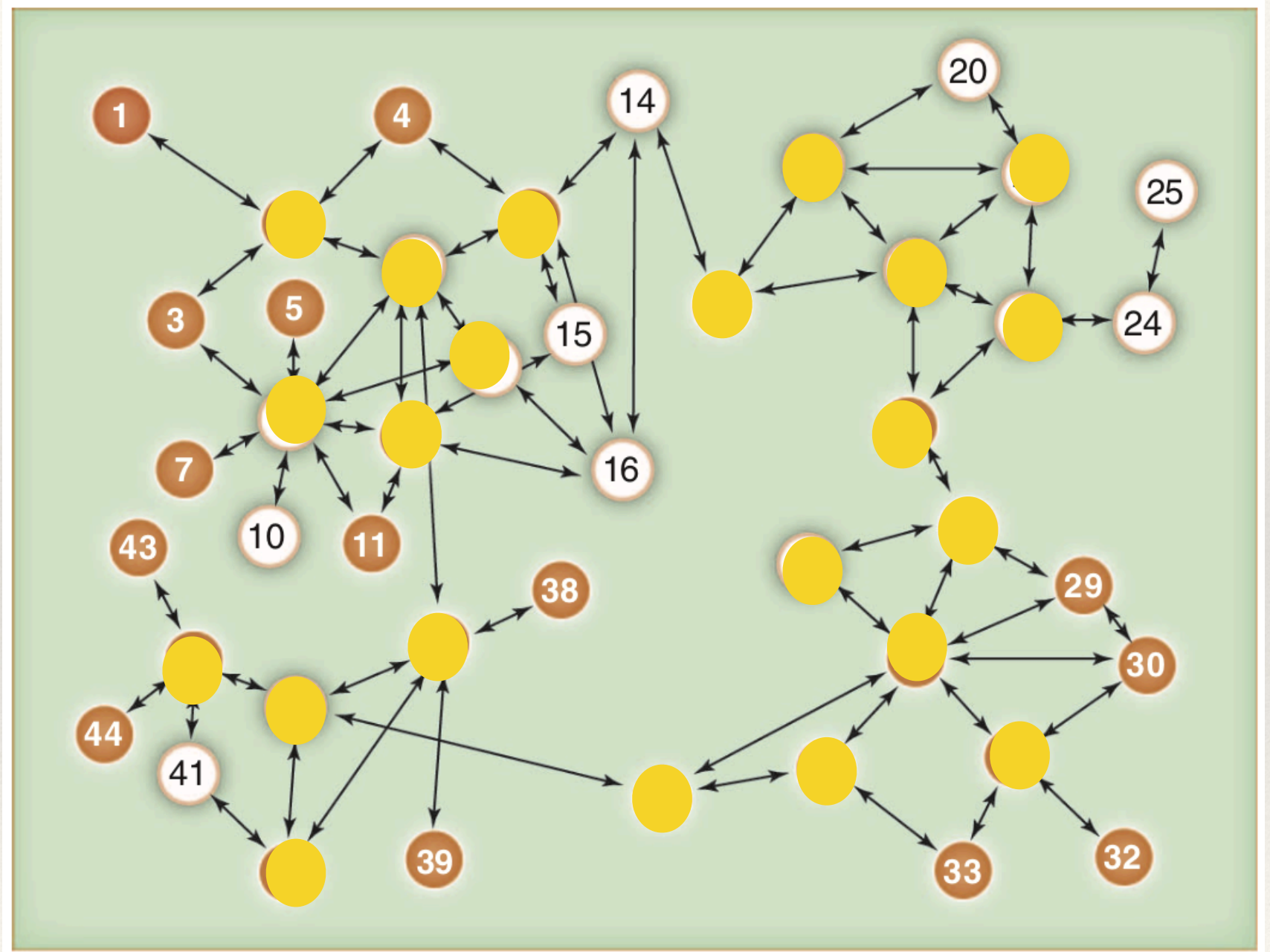
How Behavior Spreads

- ❖ Centola (2018)
 - ❖ But, research on *behavior* spread does not spread this way.
 - ❖ Behavior requires a “threshold” of exposure.



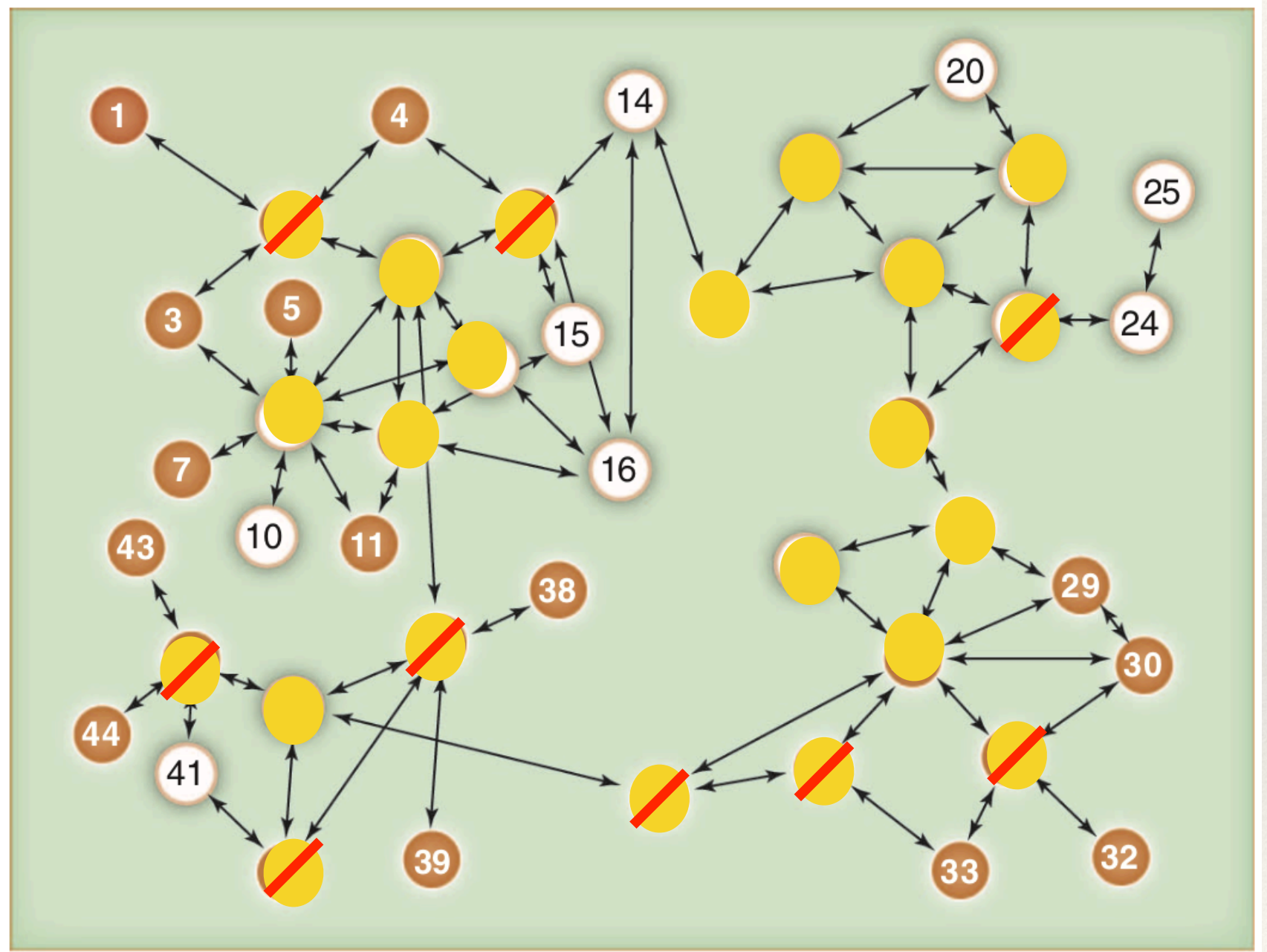
Induction

Tell your friends
and they can
activate their
trial version as
well...



Induction

Might not work
as well with a
different
distribution of
adoption
thresholds...



Alteration

- ❖ Adding or removing nodes
- ❖ Adding or removing edges
- ❖ “Rewiring” existing edges

Network Interventions

- ❖ Principles to consider:
 - ❖ What are the program goals?
 - ❖ What is the theory of behavioral change?
 - ❖ Who are the stakeholders?

Program Goals

- ❖ What are you trying to do?
 - ❖ Increase cohesion? Fragment the network?
 - ❖ Increase centralization? Decrease it?
 - ❖ **Point:** the intervention is dependent on the content.

Behavioral Theory

- ❖ Why do nodes change their behavior?
- ❖ Do you want to increase it? Decrease it?
- ❖ Why do people do things (motivations)? Why don't people do things (barriers)?
- ❖ **Point:** an intervention needs a clear model of behavioral change.

Stakeholders

- ❖ Who does this help and who is involved?
- ❖ “Insider” and “Outsider” knowledge.
- ❖ *Design Thinking* approach.

Learning Goals

- ❖ Understand the logic of **network interventions** and the various approaches.
- ❖ Discuss various principles of **network interventions**.

Questions?

Break

Discussion

Network Theories and Theories of Networks*

NETWORK THEORIES ("networks as <i>cause</i> ")			THEORIES OF NETWORKS ("networks as <i>effects</i> ")
<i>Explanatory Goal</i>			<i>Explanatory Goal</i>
<i>Explanatory Model</i>	Social Capital/ Performance ("why are the benefits?")	Homogeneity ("why are nodes similar?")	Network Structure ("why is the network this way?")
Network Flow (ties as pipes)	<u>Capitalization</u> Definition: Acquisition to resources through ties and this influences human capital which contributes to performance. Examples: Access to unique information via bridging ties. Information control benefits of structural holes. Solving problems through access to diverse knowledge.	<u>Contagion</u> Definition: Nodes become similar through a process of "infection" where various "bits" are passed from one node to the other. Examples: Diffusion of innovations. Peer influence. Disease transmission.	Examples: Homophilous Selection ("why do people with the same attitudes cluster together? They sort into these groups")
	<u>Cooperation</u> Definition: Networks provide benefits that can coordinate multiple nodes in order to bring all their resources to bear on a problem. Examples: Unionization. Collective efficacy in neighborhoods.	<u>Convergence</u> Definition: Nodes adapt to their environments, and as a result nodes with similar structural environments will demonstrate similarities. Examples: Administrative assistants have higher levels of communication in organizations.	Examples: Popularity ("why do some individuals receive more ties than others?")

*Adapted From Borgatti and Halgin (2011) and adams (2020).