“Six Degrees”: The strengths and vulnerabilities of drug trafficking networks.

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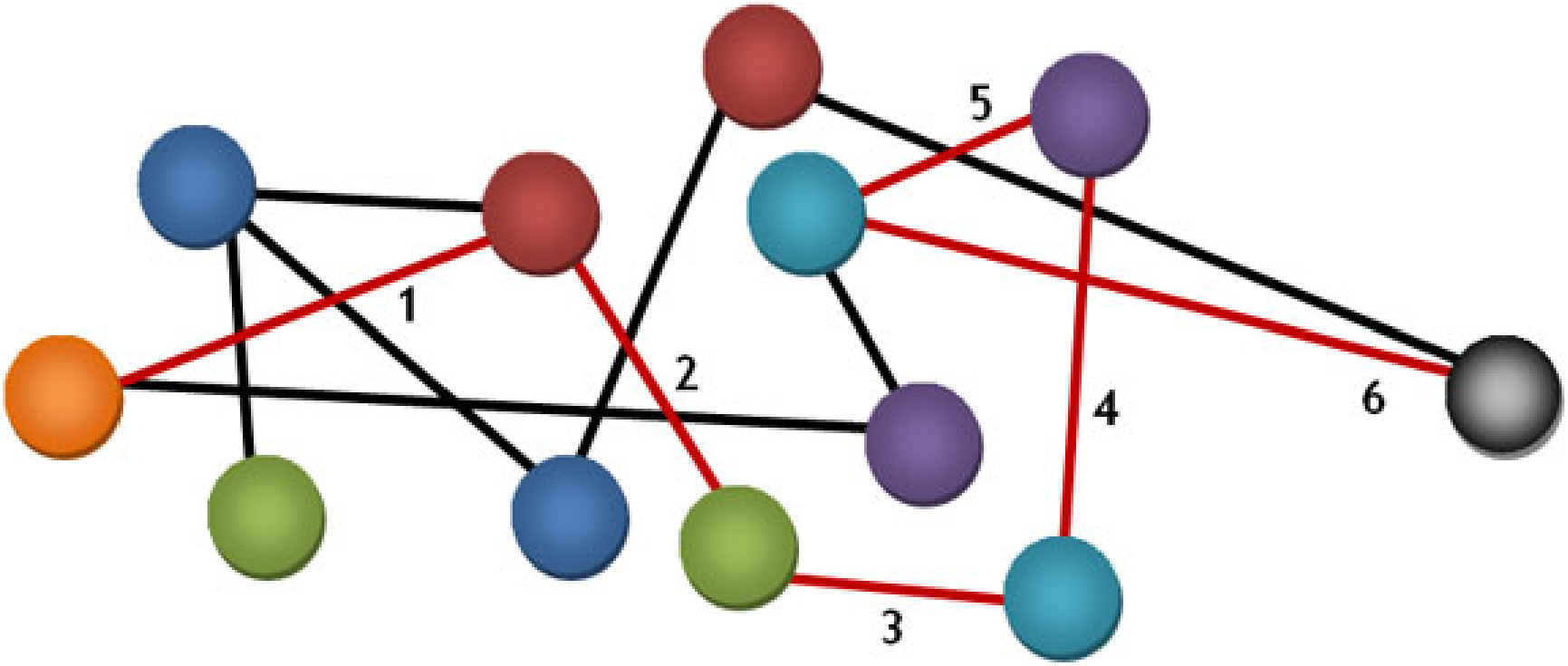
Overview of presentation

1. Intro to social networks and Social Network Analysis
2. Criminal networks 101
3. What makes criminal networks resilient/vulnerable
4. Simulation: Impact of law enforcement interventions
5. Summary and Conclusions

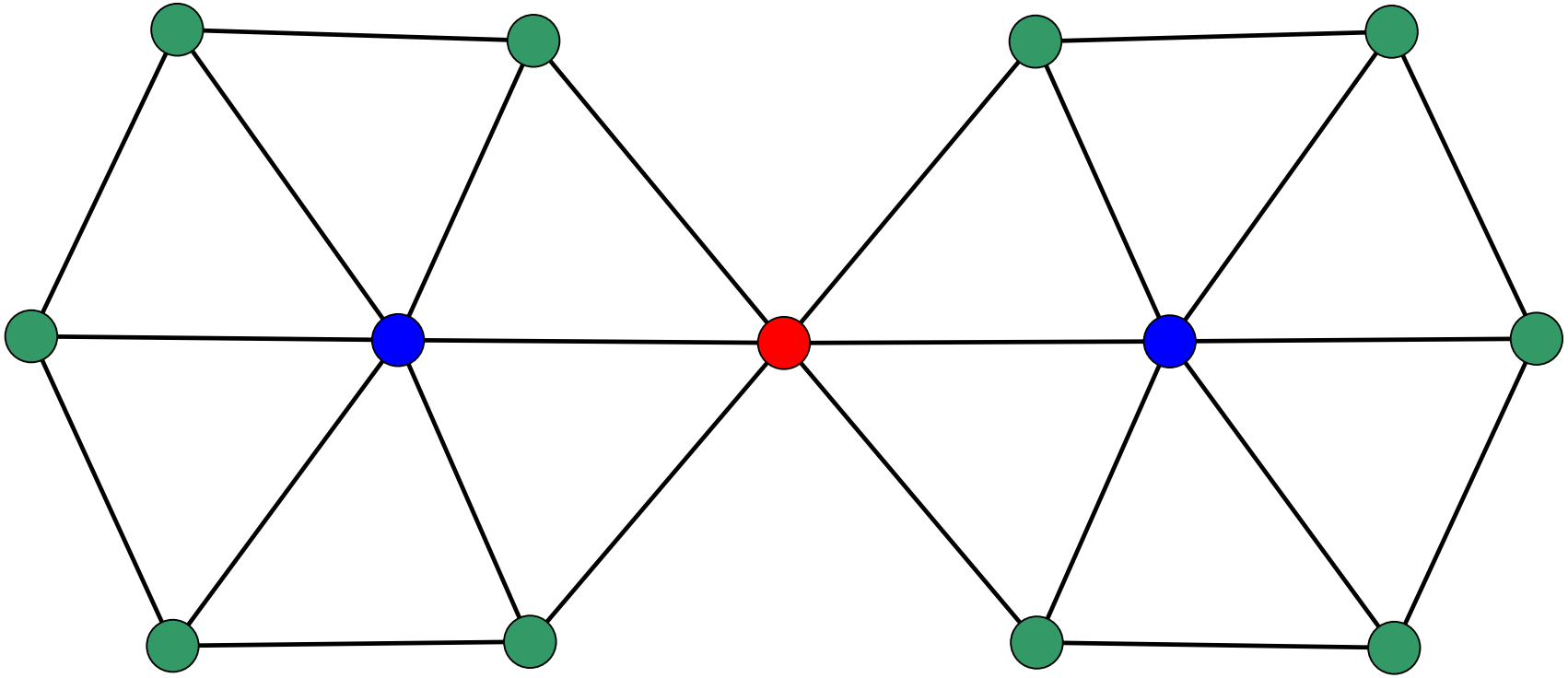
Six degrees of separation



Social Network Analysis

- Theoretical
  - Interdependence among social actors
  - Patterns in relationships among a group of individuals
- Methodological
  - Analytical techniques
  - Mathematical models: pairwise relationships among a group of objects or people

SNA Measures: Centrality



Criminal Networks

- Organised crime operates through fluid network structures, not hierarchies
- Covert settings demand specific interactions and relational features
- Focus on security:
  - Limit physical interaction
  - Buffers between individuals
  - Decentralisation of management

Criminal networks: strengths

- Facilitate flow of tangible/intangible commodities
- Flexible and dynamic
- Individuals can remain hidden
- Structure for resource pooling
- No central governing authority
- Networks can “learn”

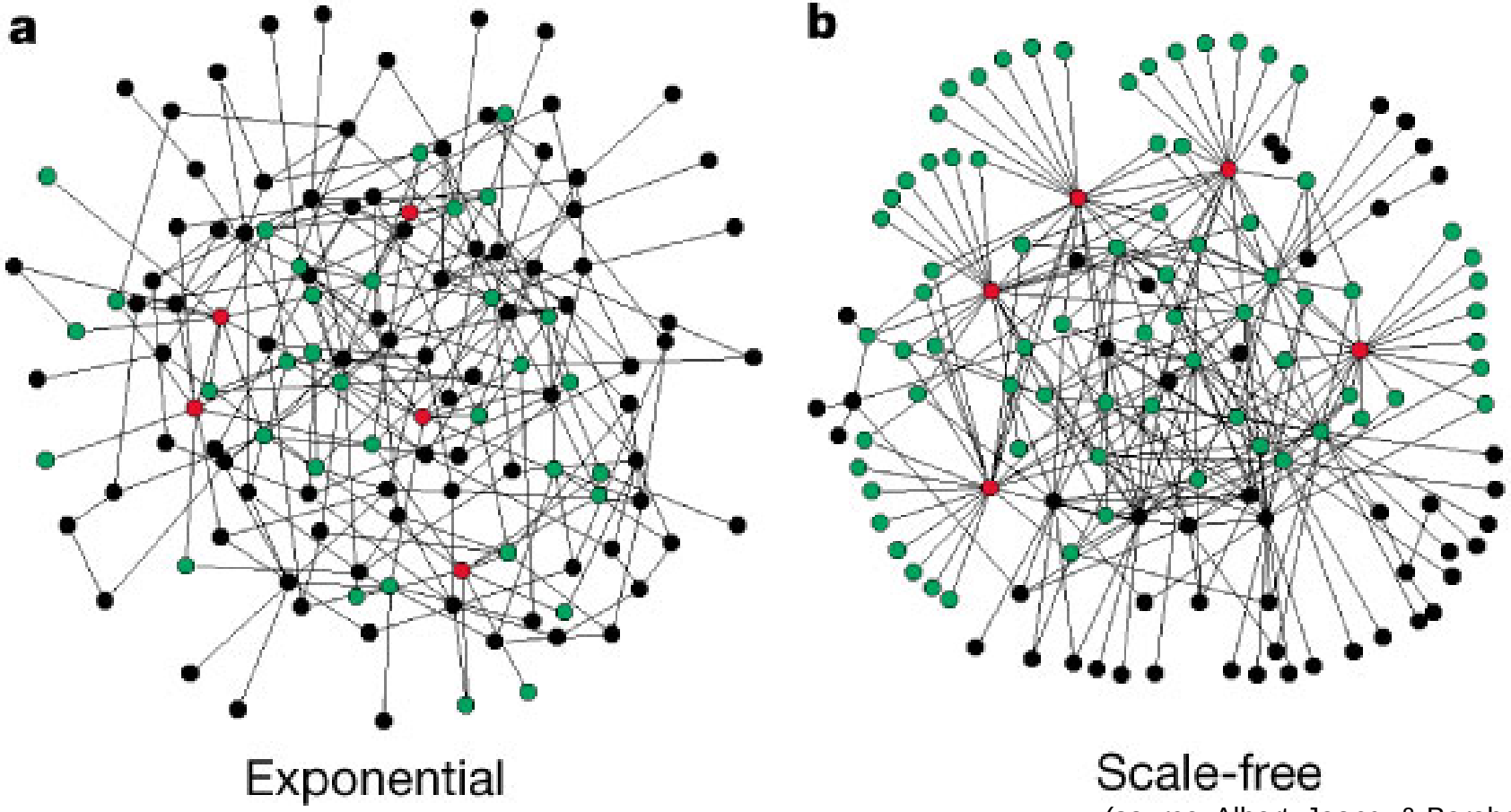
(e.g., Williams, 2001; Kenney, 2007; Morselli, 2009)

Criminal networks: vulnerabilities

- Efficiency-security trade-off
- Trust is critical
  - Larger networks sacrifice security
- Highly central nodes are vulnerable
- Arrest of one individual can cascade through network
- No central control (mistakes)
- Insulation from new ideas/information

(e.g., Williams, 2001; Kenney, 2007; Morselli, 2009; Morselli & Giguere, 2007)

Hubs as a potential weakness



(source: Albert, Jeong, & Barabasi, 2000)

Node attributes or roles

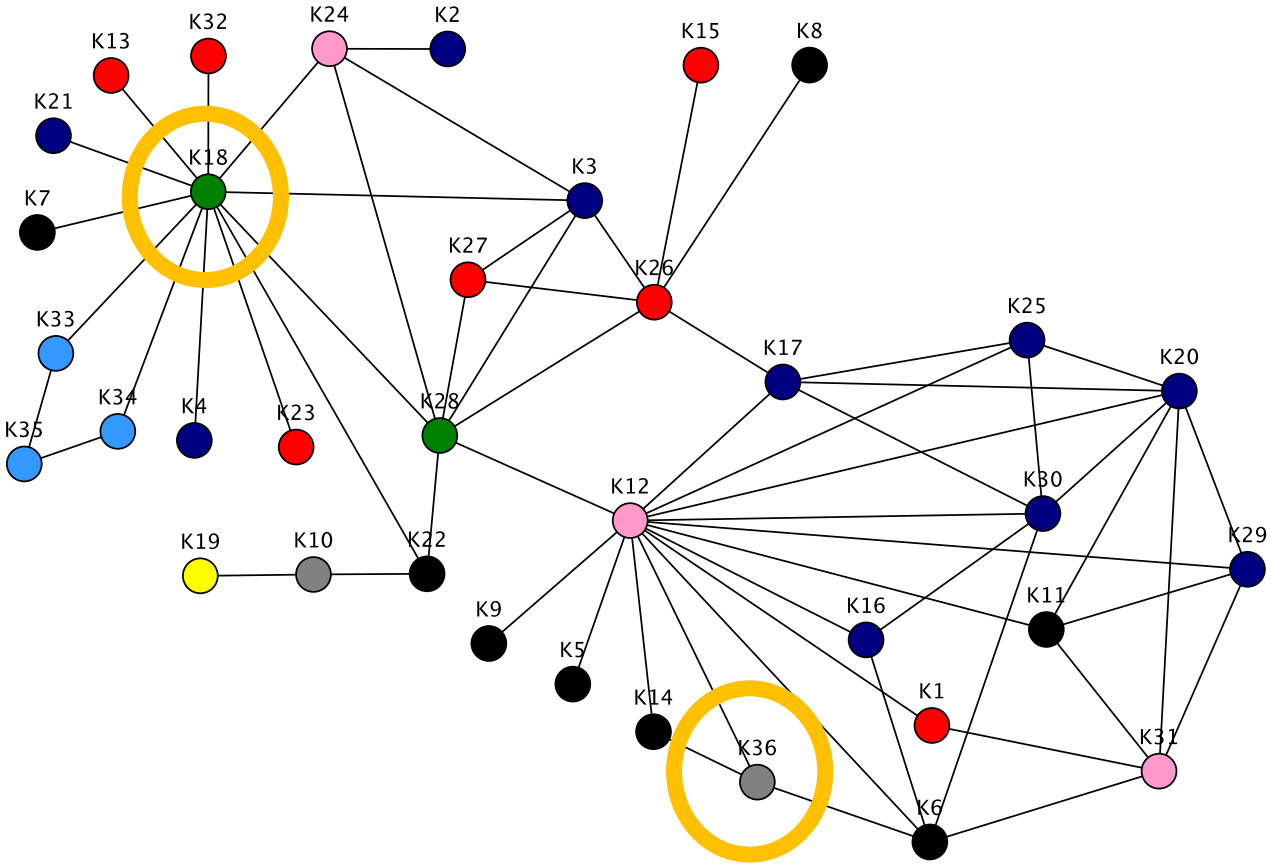
Role	Descriptor
Managers	Designated tasks to others, provided the funds for parts of the drug trafficking operation, or to whom other individuals reported.
Clan lab managers	Managed the operation of clandestine laboratory sites.
Wholesale dealers	Responsible for selling methamphetamine in single to multiple kilogram lots.
Resource providers	**Sourced chemicals and equipment required for the manufacture of the drug.**
Specialists	**Possessed specialist knowledge and skill in the manufacture of methamphetamine.**
Workers/labourers	**Paid a wage to complete tasks or follow orders.**
Corrupt officials	Occupied government positions and received bribes to behave in corrupt ways.

Adapted from Bright, Hughes & Chalmers (2012)

Dismantling or disrupting criminal networks

- “There are a limited number of people who have the network of contacts within the criminal underworld, and more importantly the level of trust that enables them to bring together the suppliers, investors, contractors, customers and the situational elements to conduct a successful importation.” (Hawley, 2002; p. 46)

So which nodes are “key” to the network?



Manager/Assistant manager

Clan lab “branch manager”

Resource provider

Possession of specialist skills

Worker/labourer

Corrupt officials

Wholesale dealer

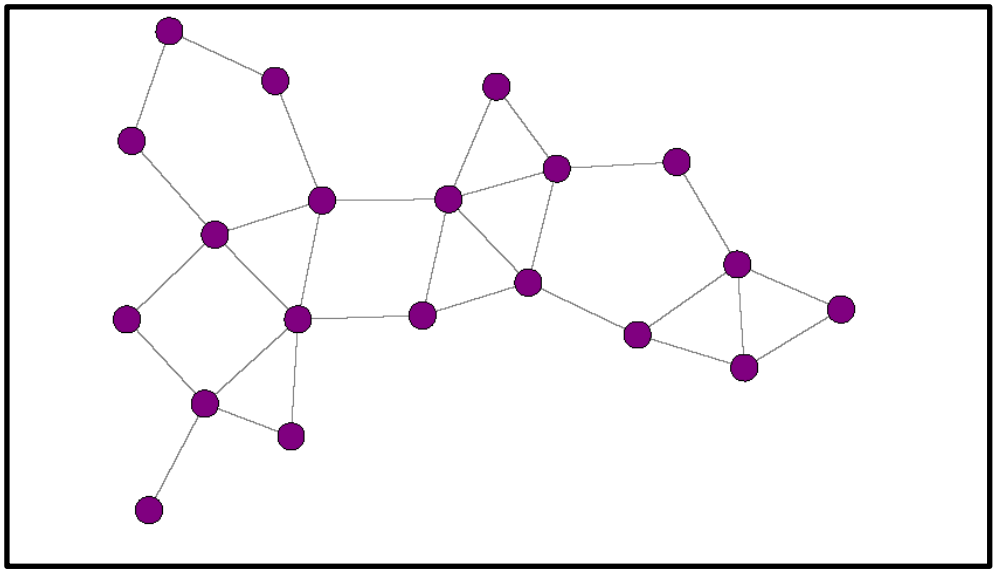
Unknown

Adapted from Bright, Hughes & Chalmers (2012)

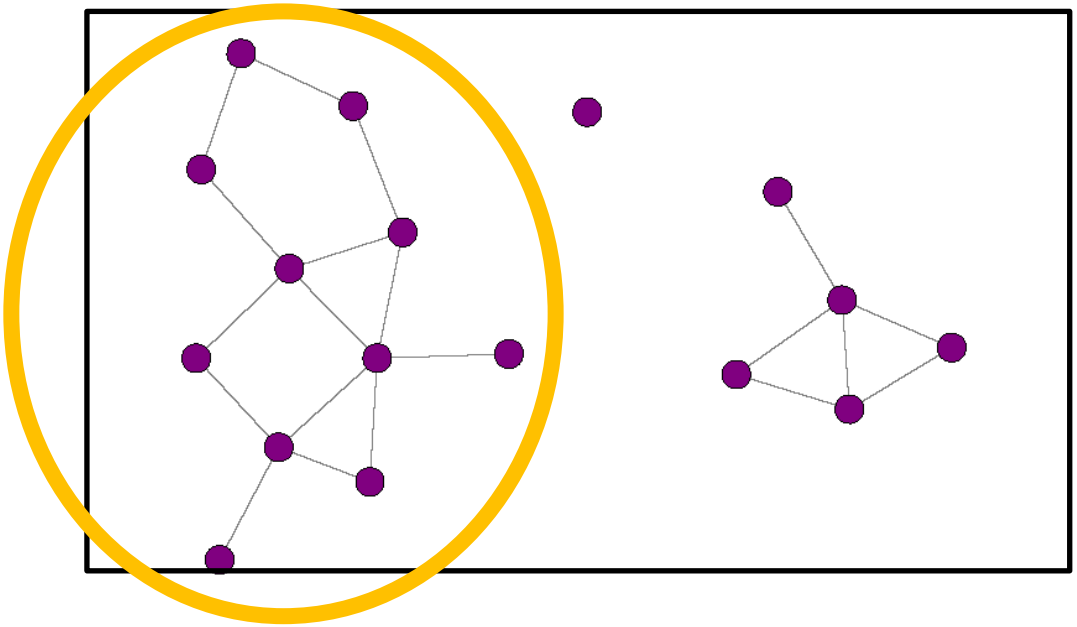
Study: Law enforcement simulations

(Bright, Greenhill, & Levenkova, 2011)

- Four law enforcement “interventions”:
  - Target most connected nodes (high degree centrality)
  - Target nodes which play most important roles
  - Mix of centrality and role
  - Random
- Outcome measures
  - Number of nodes in the largest remaining connected component
  - Largest connected component + importance of remaining connected nodes



Network at Time 1



Network at Time 2

Dismantle + Disrupt: What works?

- Relatively effective:
  - Targeting nodes based on
    - degree centrality
    - degree + role
- Relatively ineffective:
  - Targeting nodes based on role only

- Limitations
  - No network adaptation
  - Too simplistic

Summary and conclusions

- Networks as primary type of criminal grouping
- Criminal networks are
  - Flexible and adaptive
  - Vulnerable to targeted removal of hubs
- Pressing need for research collaboration
  - Law enforcement (criminal networks expertise)
  - Academic researchers (methodology/SNA expertise)

Acknowledgments

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