Australian Institute for
Disaster Resilience
THE UNIVERSITY OF
MELBOURNE
Beyond Bushfires Recovery Matters webinar series
Social networks and disaster resilience
Exploring the 10 Years Beyond Bushfires Report
22 September, 2021
2pm AEST
aidr.org.au/events
SPEAKERS
Dr Colin Gallagher, University of Melbourne
Dr Michele L Barnes, James Cook University
HOSTED BY
Amanda Leck, AIDR

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Beyond Bushfires Recovery Matters webinar series

Welcome

Amanda Leck

Executive Director, AIDR

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Acknowledgement of Country

AIDR acknowledges the Traditional Custodians of the various lands on which you all join us from today and the Aboriginal and Torres Strait Islander people participating in this event.

We pay our respects to Elders past, present and emerging and celebrate the diversity of Aboriginal peoples and their ongoing cultures and connections to the lands and waters across Australia.

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Housekeeping

- Today's event will be recorded and made available after the event.
- Please enter questions for our speakers in the Q&A function, not the chat box.
- Please use the chat box to share any thoughts or reflections during the presentation – remember to select 'all panellists and attendees' to ensure everyone can read your message.
- Please be respectful to each other when posting your comments or questions.

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Dr Colin Gallagher

Child & Community Wellbeing Unit, Centre for Health Equity, Melbourne University

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10 years Beyond Bushfires – Social network findings

Dr Colin Gallagher

Melbourne School of Population and Global Health
The University of Melbourne

MelNet

THE UNIVERSITY OF MELBOURNE

10 YEARS **BEYOND BUSHFIRES** REPORT

MARCH 2021

THE UNIVERSITY OF MELBOURNE

Contributors:

Lisa Gibbs, Robyn Molyneaux, Louise Harms, H. Colin Gallagher, Karen Block, John Richardson, Vaughn Brandenburg, Meaghan O'Donnell, Connie Kellett, Phoebe Quinn, Lauren Kosta, Kate Brady, Greg Ireton, Colin MacDougall, Richard Bryant.

Funding partners:

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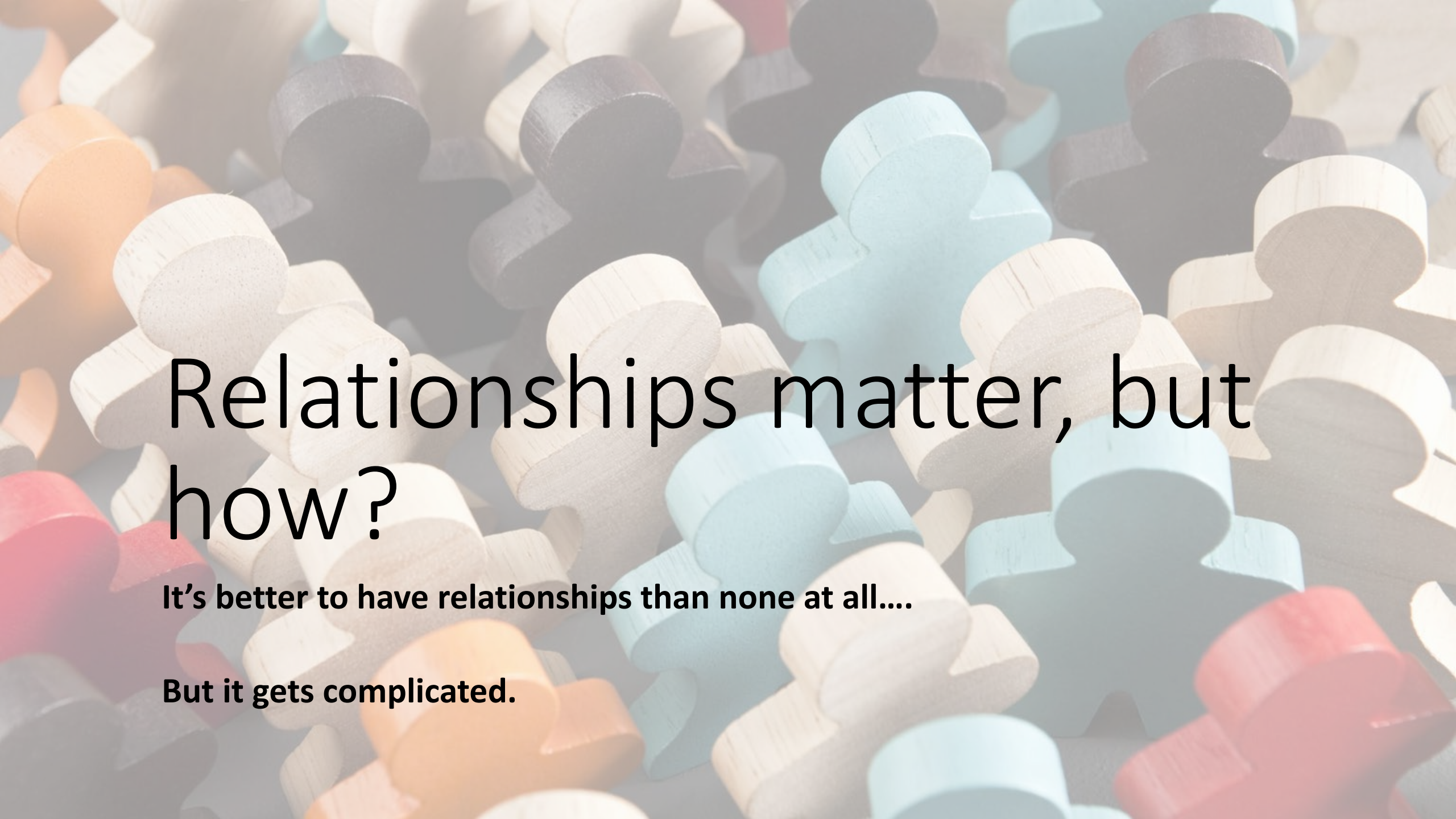


Relationships matter, but how?

It’s better to have relationships than none at all….

But it gets complicated.

Interdependence is at the heart of disasters

- “Prototypical” natural disasters affect place-based communities
- Help-givers are often also help-seekers (Varda, et al 2009)
- Disasters are inherently collective events.
  - Shared trauma, losses, social disruption

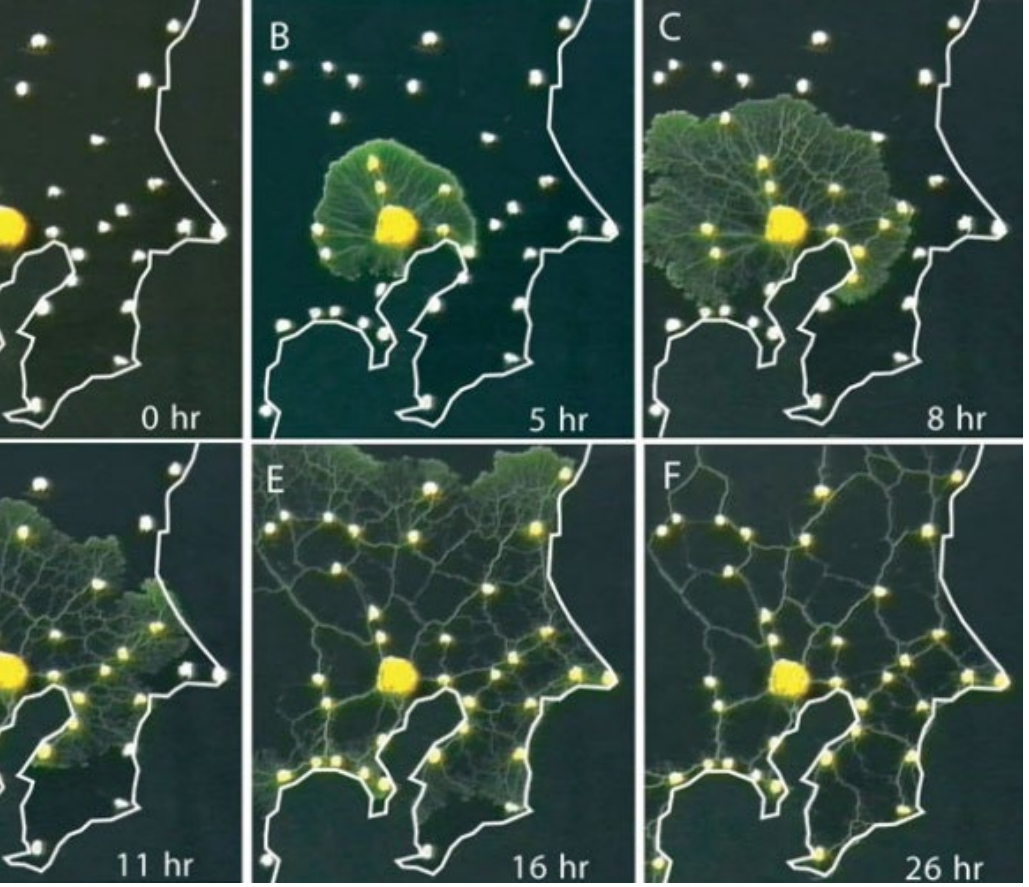
Interdependence is key to resilience

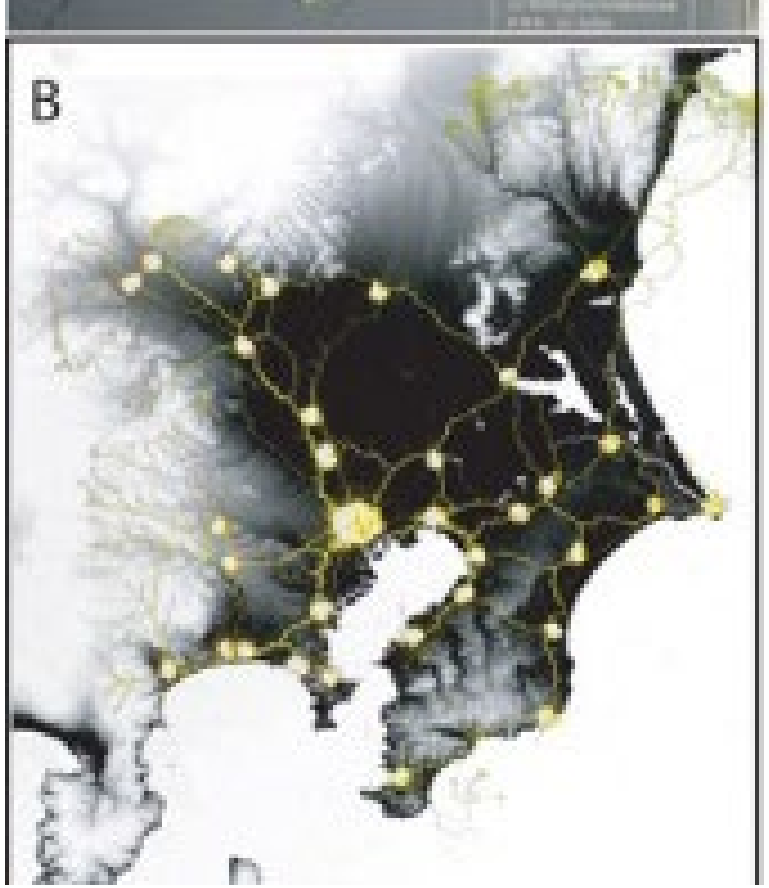
- A capacity to absorb, adapt, transform
- “The whole is more than the sum of its parts.”
- “People in communities are resilient together, not merely in similar ways.” (Brown & Kulig, 1996)

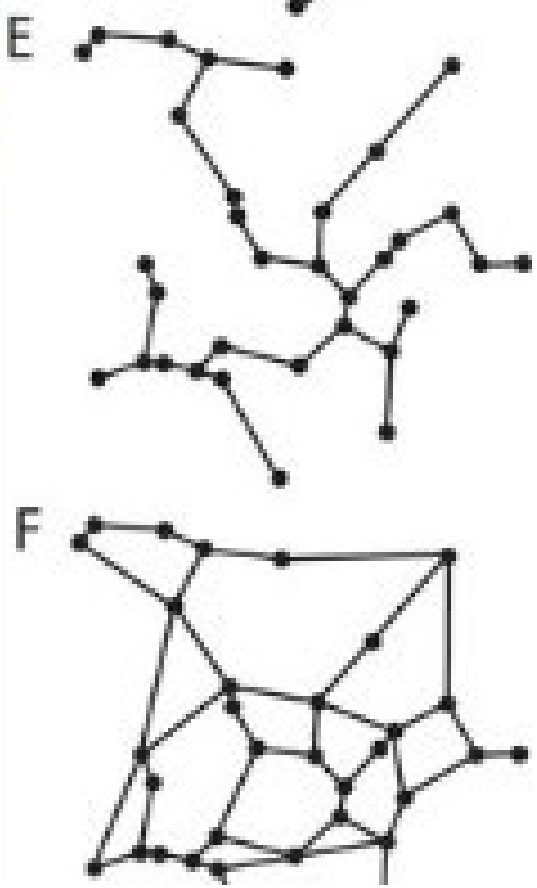
- But these are pretty vague contours…
- How do we conceptualise and measure resilience?

Well, it’s complicated…

- What type of relationship?
- How many?
- Under what circumstances?
- Good for *what*?
- Good for everyone involved?
- Positive versus negative influences?
- How does a relationship between two people affect a third person?



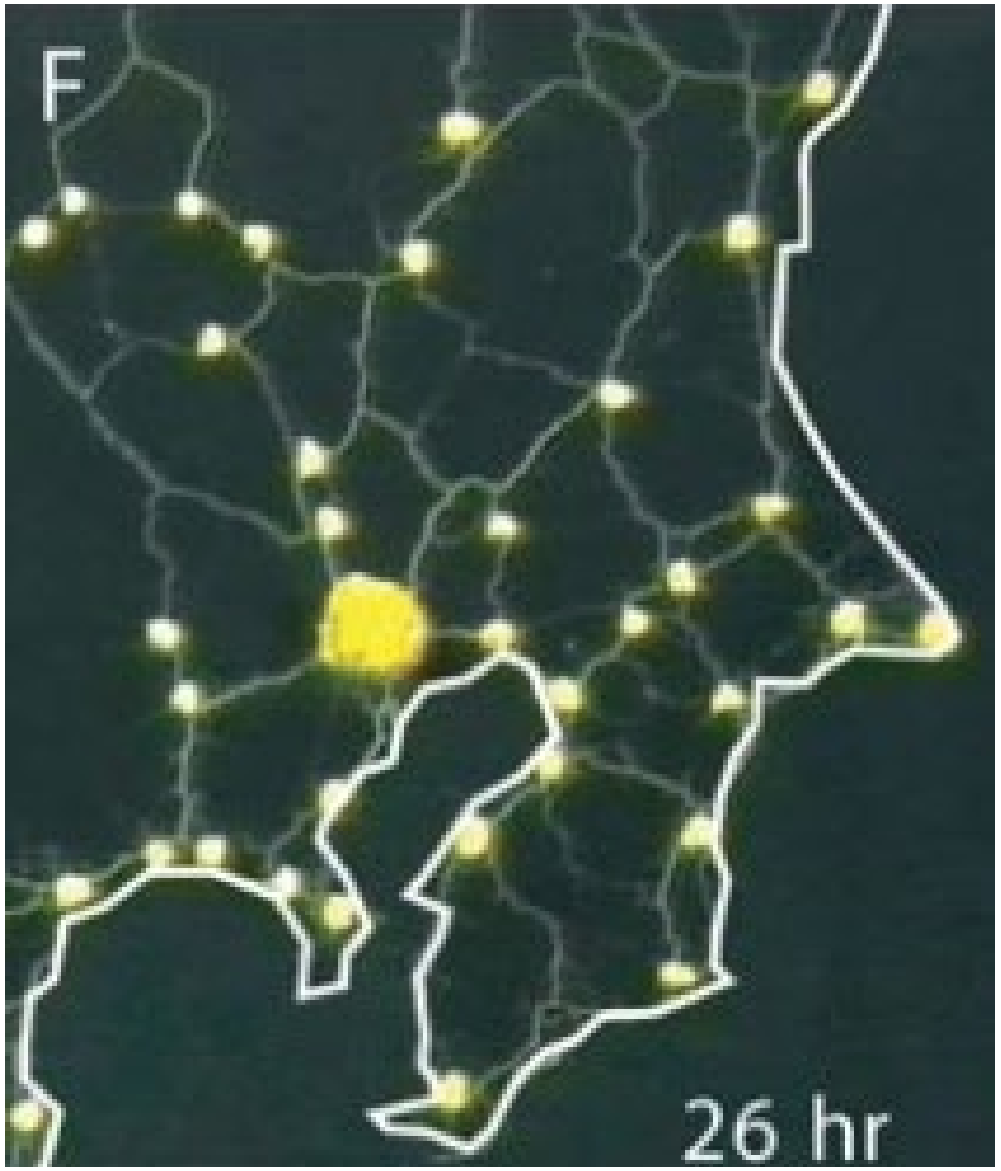




Slime moulds and the Japanese rail system

Tero, A., Takagi, S., Saigusa, T., Ito, K., Bebber, D. P., Fricker, M. D., ... & Nakagaki, T. (2010). Rules for biologically inspired adaptive network design. *Science*, *327*(5964), 439-442.

https://www.wired.com/2010/01/slime-mold-grows-network-just-like-tokyo-rail-system/



Slime moulds and the Japanese rail system

- Simple **local** processes/principles

- But remarkable **system-wide** properties

https://www.wired.com/2010/01/slime-mold-grows-network-just-like-tokyo-rail-system/

People have many possible social connections with each other.

- ***Roles***: Marriage/Kinship, Friends, Coworkers, Caring
- ***Content***: Support, Information, Advice
- **Emotion/behaviour:** Liking/Disliking, Trust, Conflict

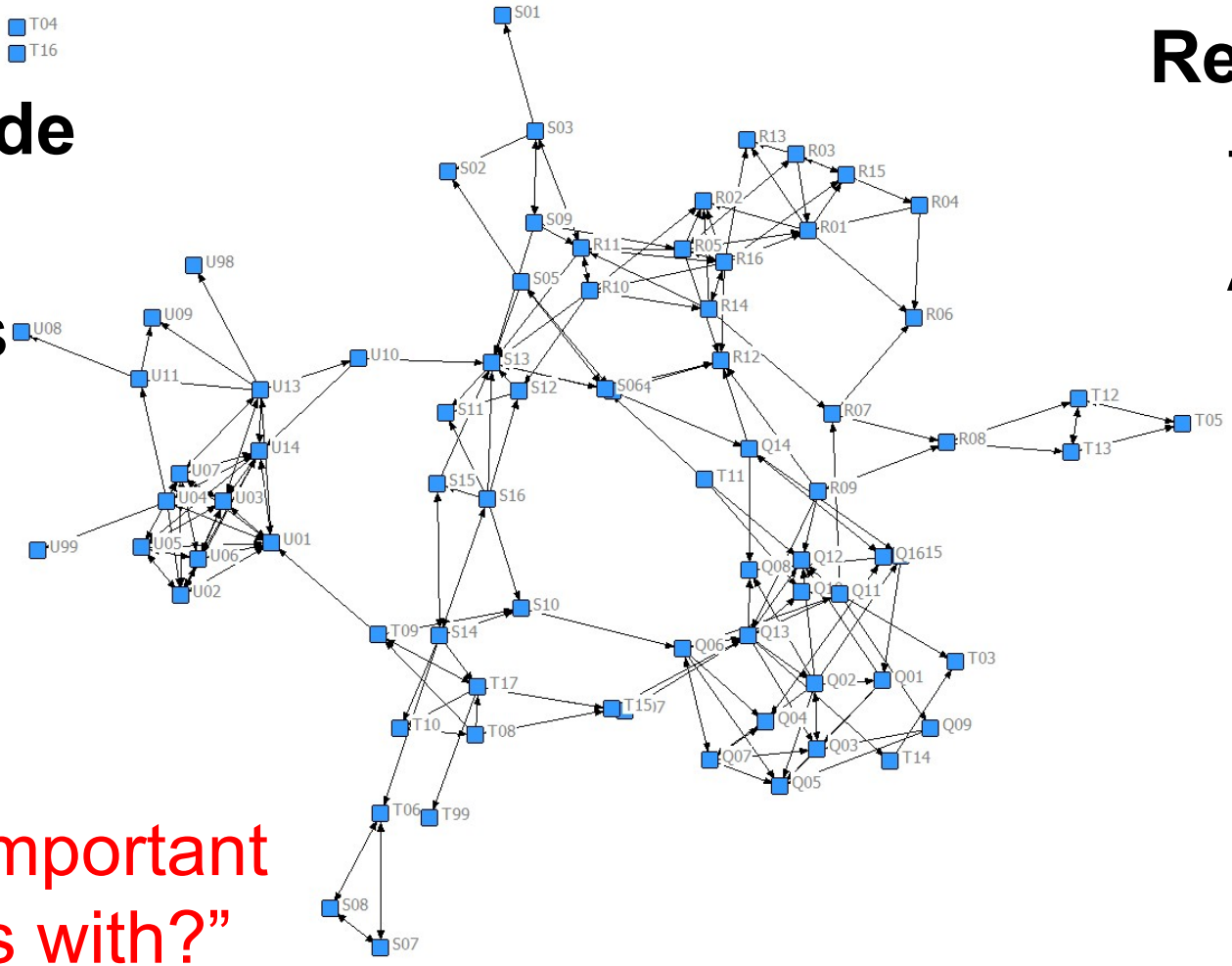
Social Network Analysis (SNA)

Network Science of connection

Actors or node

People
Organizations
Countries

Animals
Species



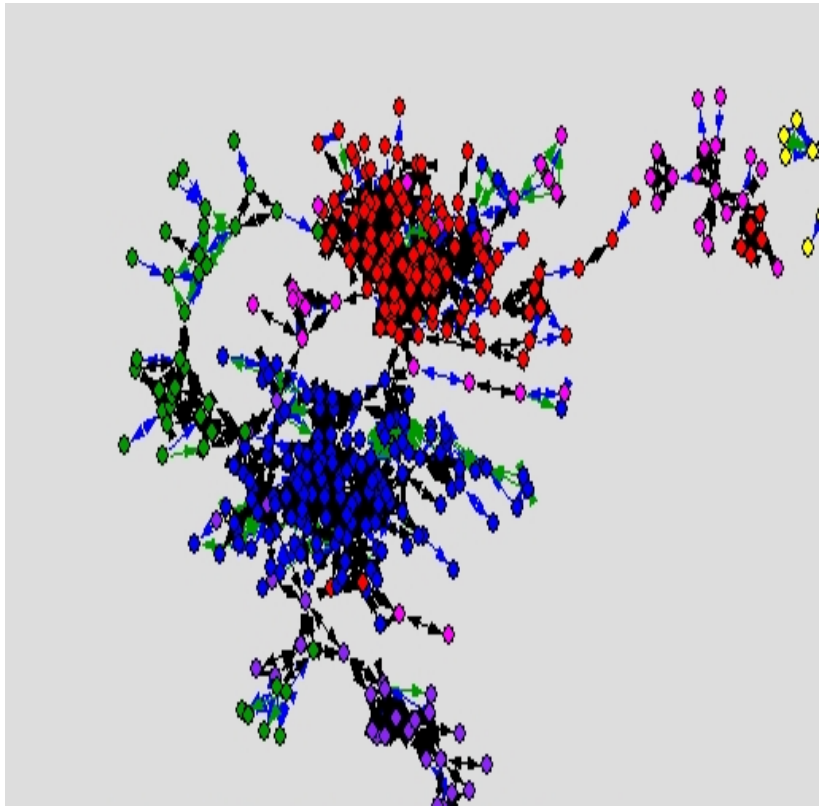
Relations, ties

Trust
Advice
Knowledge
Disagree with

"Who do you important conversations with?"

Social support networks

BeyondBushfires
community | resilience | recovery



Social support networks

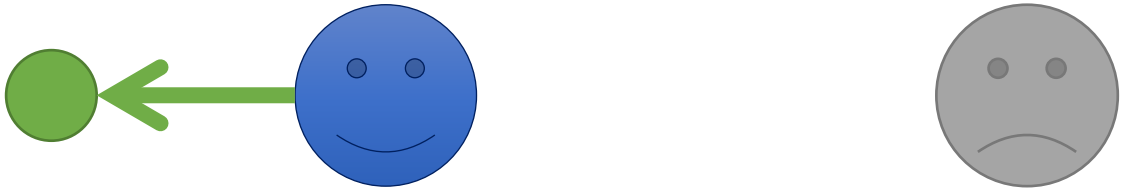
- Close emotional connections
- Practical assistance

- Role relationships:
  - Spouses, friends, family, neighbours, etc.

- Mental health outcomes:
  - Depression, PTSD

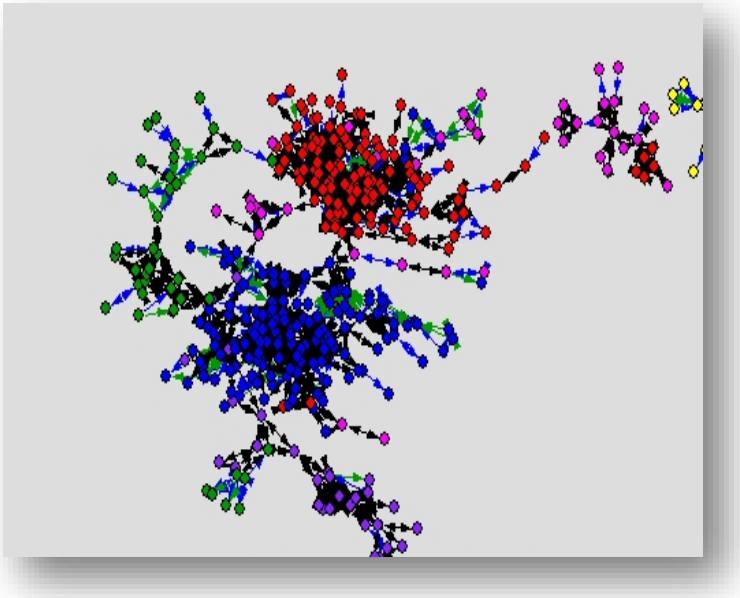
Results: Depression

Sender effect:
Outgoing ties

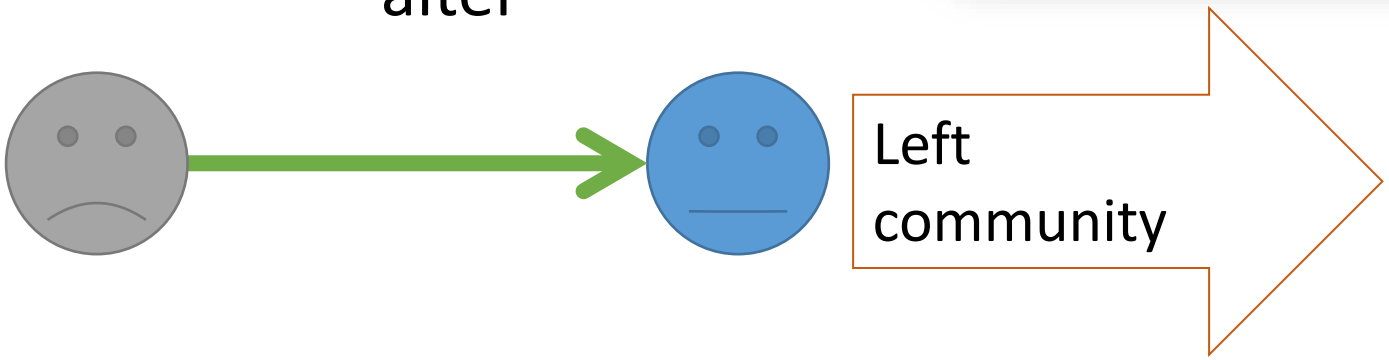


- Feeling close to others predicts less depression
- Analogous to perceived social support
- Two important qualifications…

Results: Depression

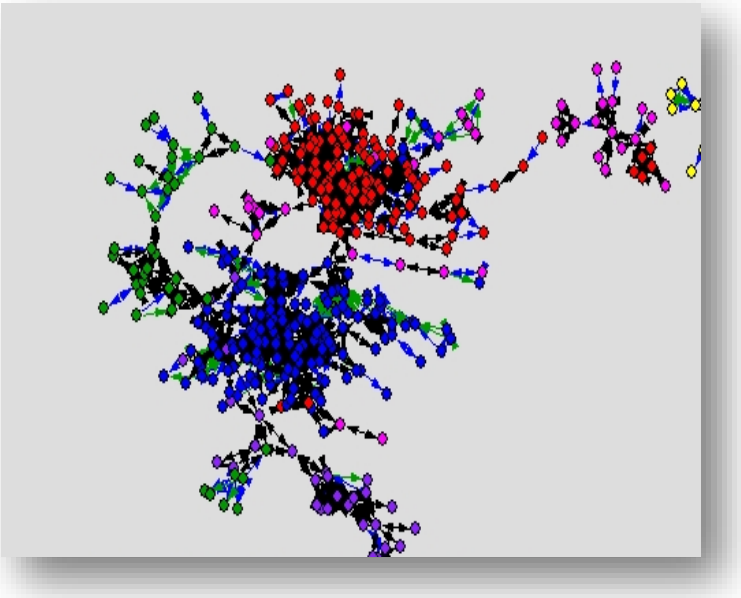


Sender × Relocated alter



- Loss of social support

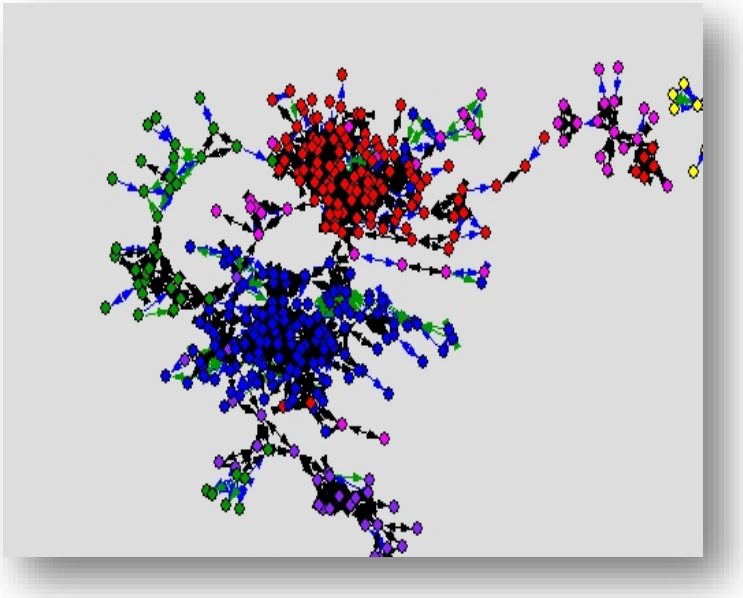
Results: Depression



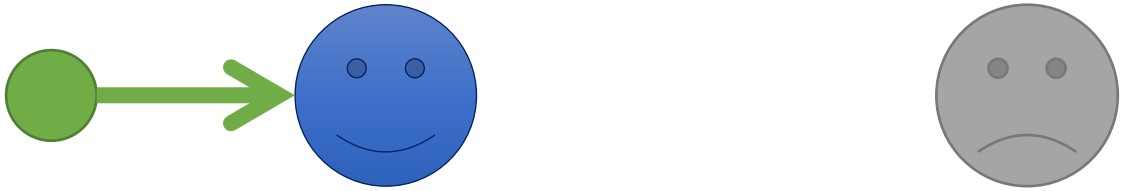
"Contagion"

- Co-occurs across social ties
  - Various selection and influence mechanisms possible (Schaefer & Simpkins, 2014)
  - Social influence: Spread of mood

Results: PTSD



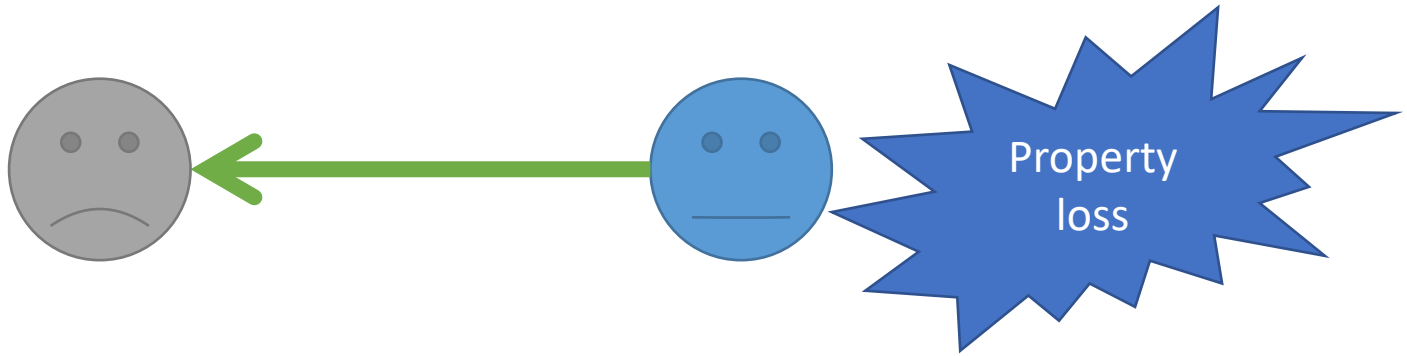
Receiver effect:
Incoming ties



- Fewer incoming ties -> greater risk
  - Low enacted social support from others AND/OR
  - Avoidance -> loss of social support **(Kaniasty et al, 2006)**

Results: PTSD

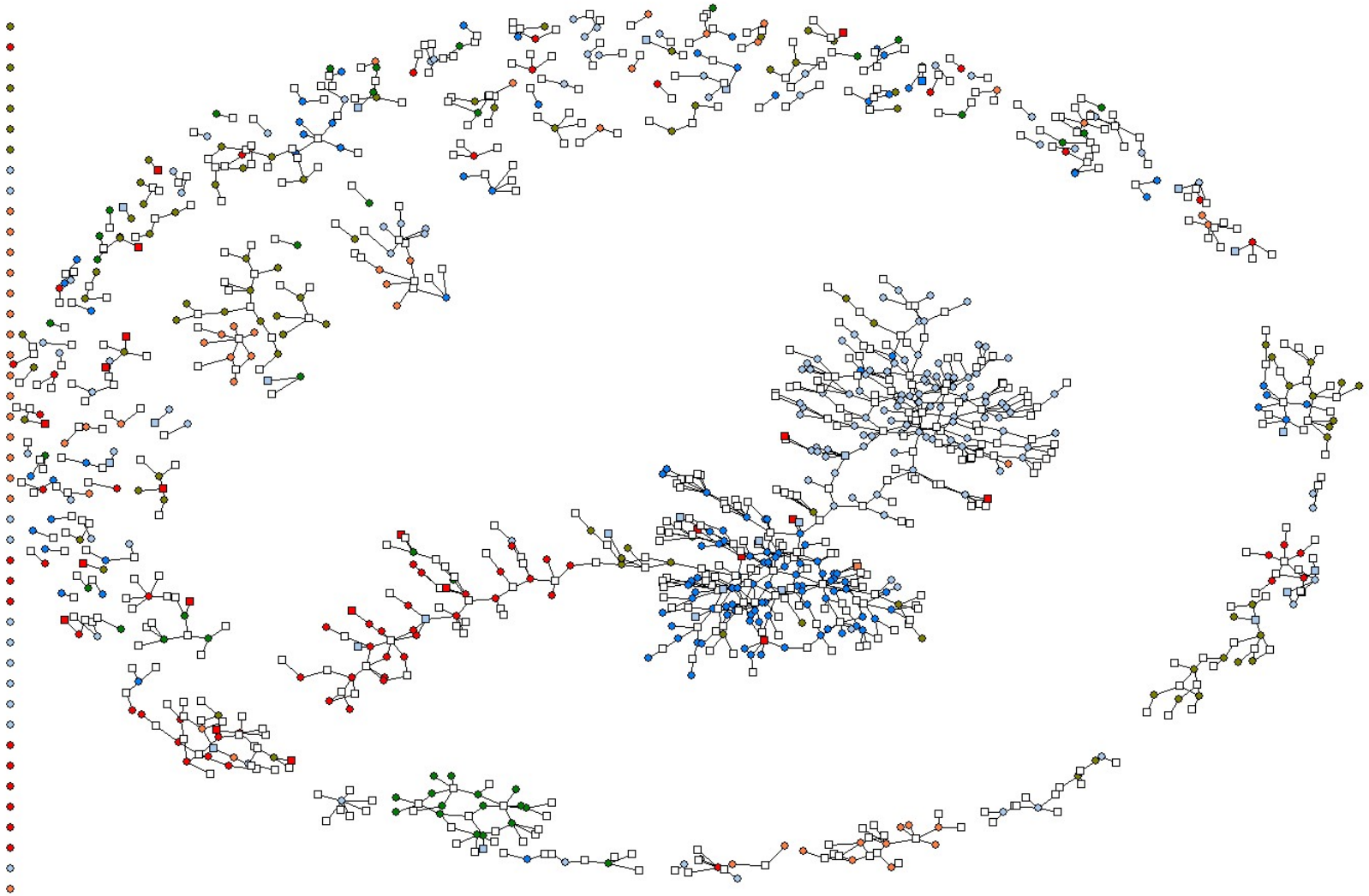
Receiver × alter's property loss

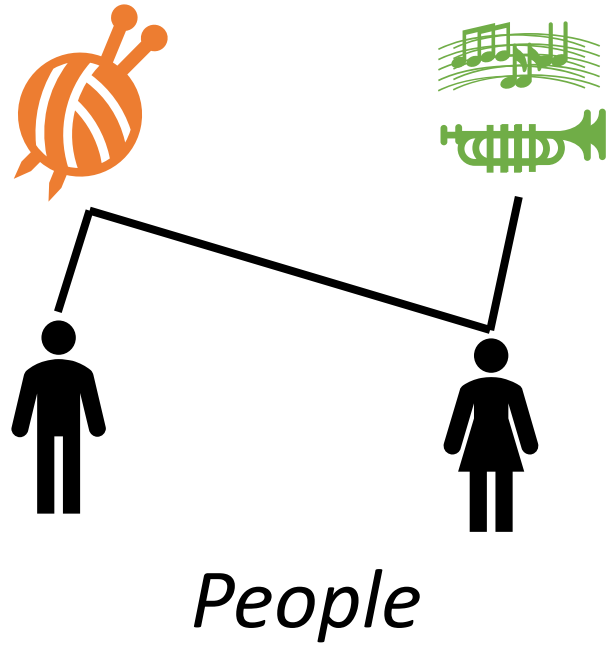


- In other words, ego's property loss increased the risk for PTSD for alters to whom ego feels close.
- Collective disaster exposure.

Group involvement & Mental health

Community structure as Group co-affiliation





Group involvement

For the individual

- No participation (~45%) – increased risk of PTSD

Group involvement

For the individual

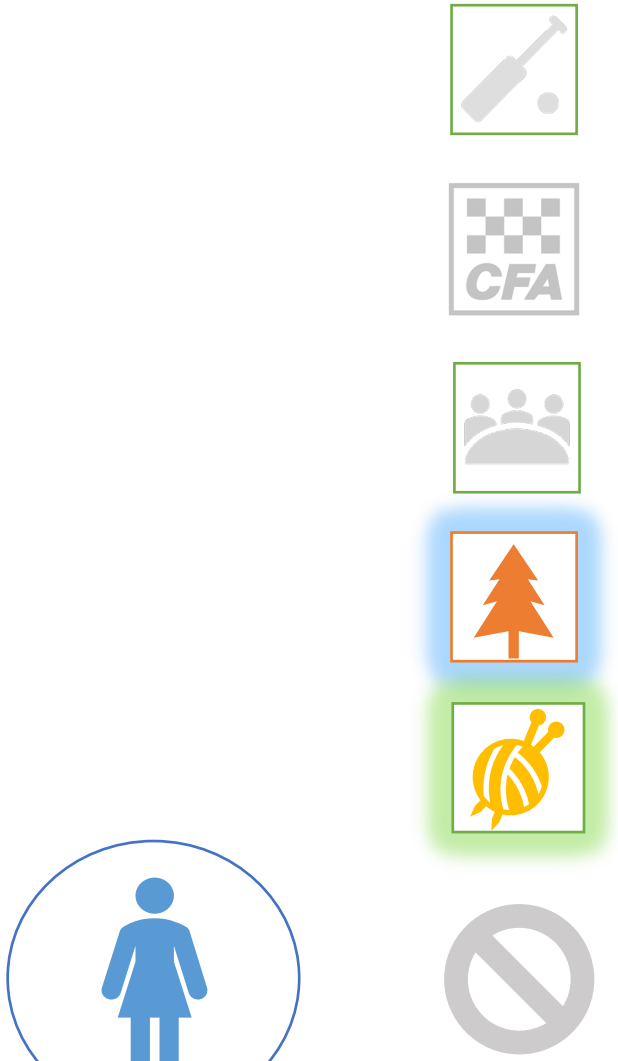
- No participation

- One group – decreasing risk of PTSD

Group involvement

For the individual

- No participation
- One group
- 2 groups – most benefit



Group involvement

For the individual

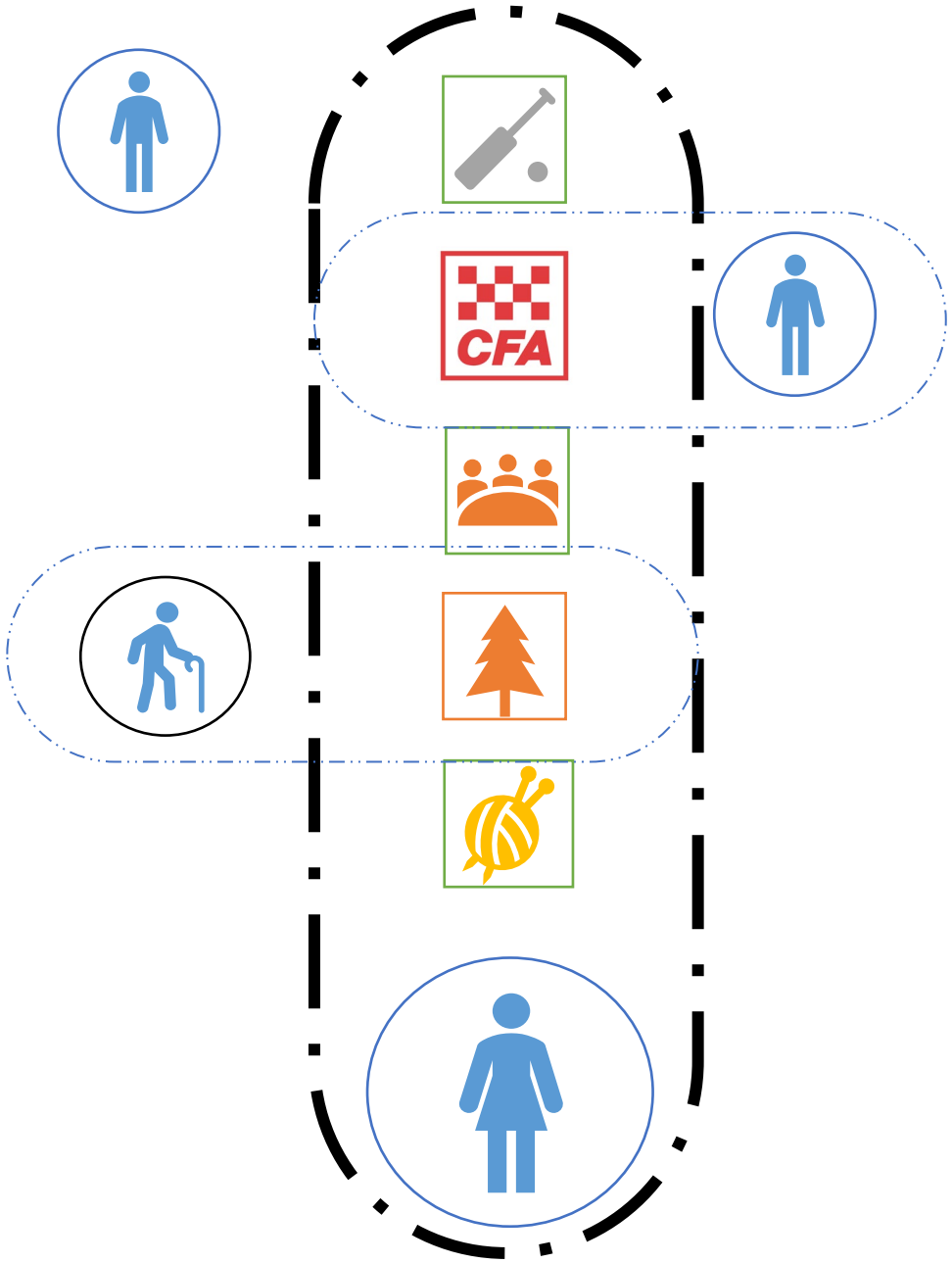
- No participation
- One group
- 2 groups
- 3+ groups – increasing risk of PTSD

Group involvement

For the community as a whole

Increased risk of PTSD across the community…

- **Imbalanced** group involvement
- A few people overinvolved
- Most people underinvolved
- Centralised, Inequitable

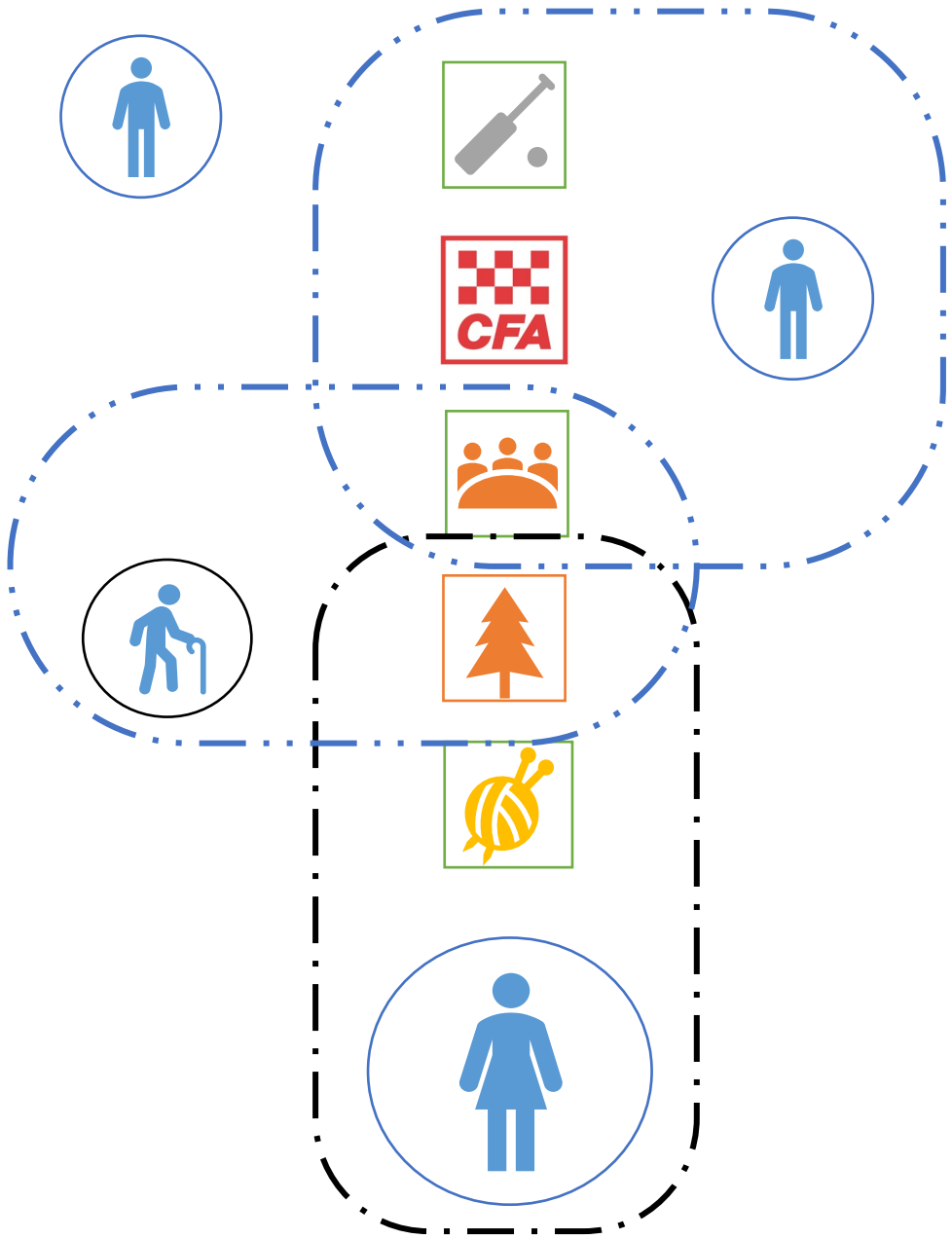


Group involvement

For the community as a whole

Lower risk of PTSD more generally across the community

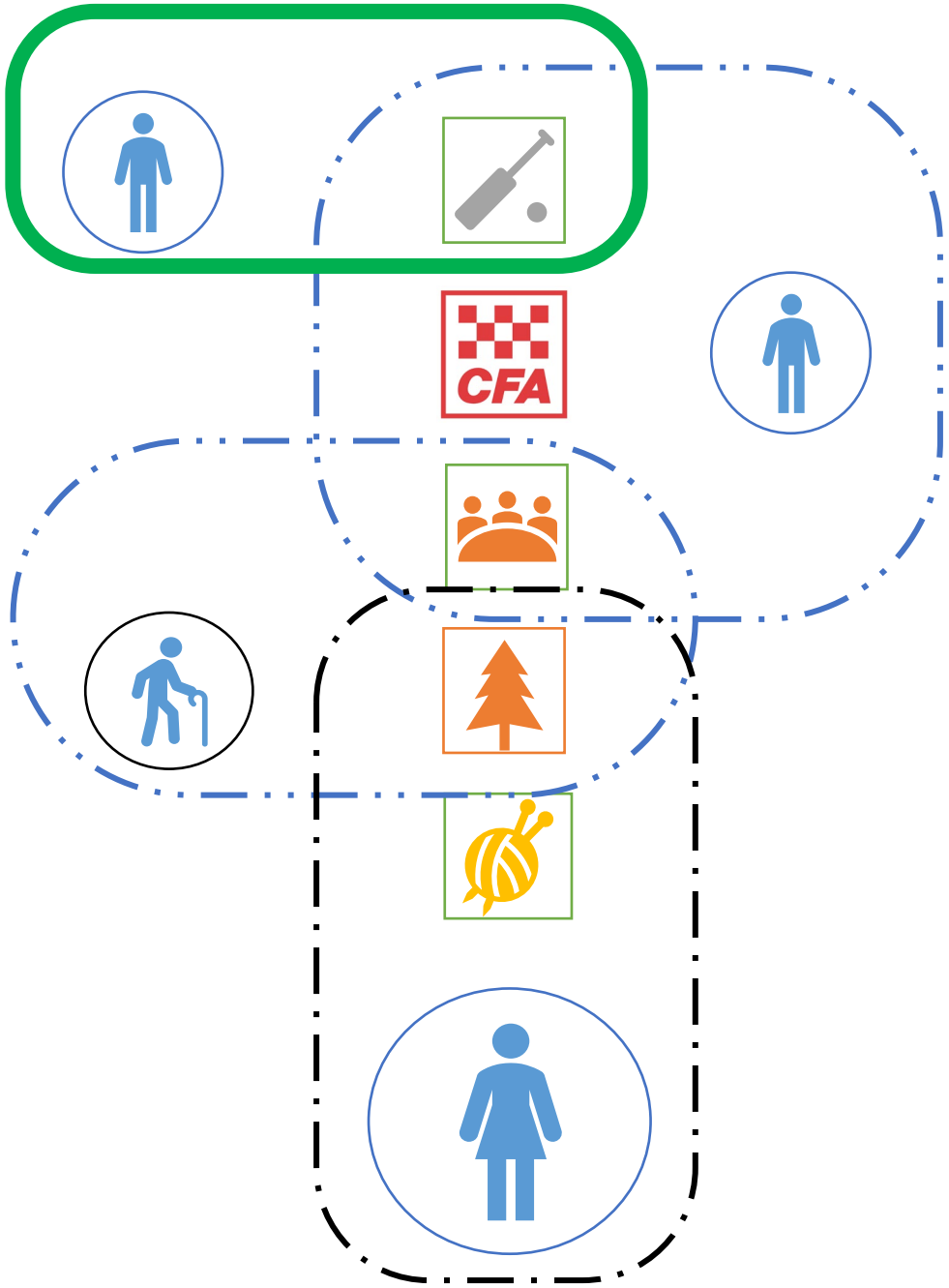
- **Balanced** group participation.
- Sharing the load.
- Most people involved to some degree.
- De-centralised, equitable
- Even those with no involvements may still benefit.



What to do?

For the underinvolved…

- Foster opportunities for group involvement.
- Behavioural activation.



However…

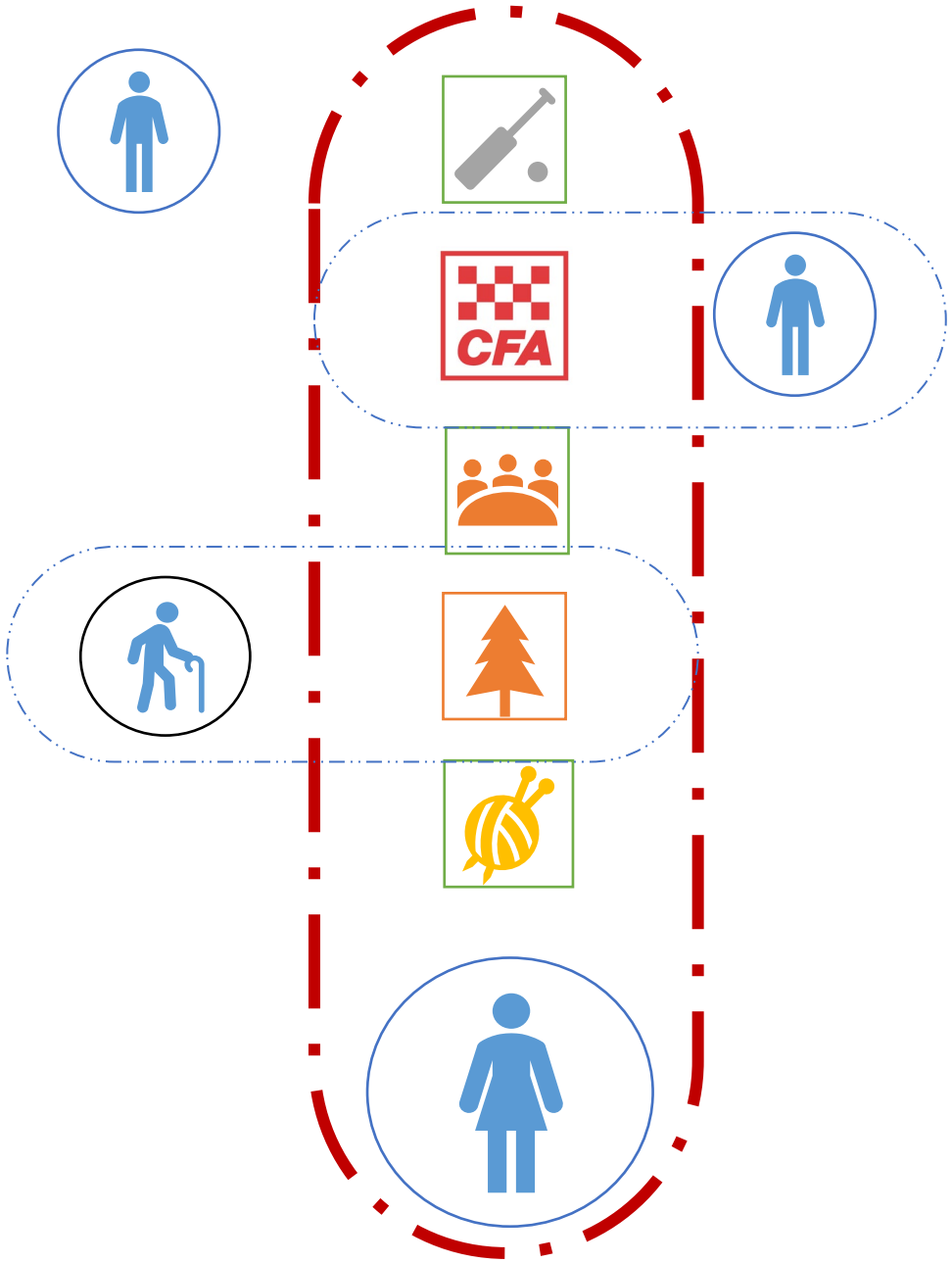
- Simply creating new groups could have an unintended effect!
- Those who are “good at groups” may simply join more.
- Target the **underinvolved** specifically

What to do?

For the overinvolved…

Dilemma!

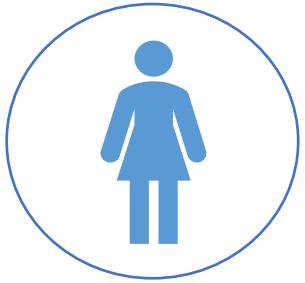
- Reducing involvement might benefit the overinvolved individual themself…
- But it may **hurt** the groups they withdraw from.
- Support for groups and leaders



What to do?

Measuring group involvement…

- Relatively easy to do.
- Meaningful.
- A potential map for engagement.
  - Popular groups
  - Which groups tend to be people's **only** involvement?
- Distribution is key (Share the load).



Resilient communities

Social support ties…

- Withstand trauma and disruption, and
- Outweigh potential negative social influences
  - mental health, relocation

Group involvement is…

- Balanced, de-centralised, wide-spread moderation
- Sufficient number and succession of community leaders

Health and Place 57 (2019) 61–69

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Health & Place

journal homepage: www.elsevier.com/locate/healthplace

The role of the natural environment in disaster recovery: "We live here because we love the bush"

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Topophilia

ABSTRACT

This mixed-methods study explored the role of connection to the natural environment in recovery from the 'Black Saturday' bushfires that blazed across Victoria, Australia, in February 2009. Qualitative findings demonstrated that many participants had a strong connection to the natural environment, experienced considerable grief as a result of its devastation in the fires and drew solace from seeing it regenerate over the following months and years. Quantitative analyses indicated that a strong attachment to the environment was associated with reduced psychological distress, fewer symptoms of major depression and fire-related PTSD, and higher levels of resilience, post-traumatic growth and life satisfaction. While social connections are increasingly recognized as supportive of disaster recovery, the influence of landscapes also needs to be recognized in terms of the impact of their destruction as well as their therapeutic potential.

Other forms of connection

- **Social, Economic, Infrastructural**
- **Ecological, Connection to Nature**

10 YEARS

Beyond Bushfires

community | resilience | recovery

www.beyondbushfires.org.au

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References

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Tero, A., Takagi, S., Saigusa, T., Ito, K., Bebber, D. P., Fricker, M. D., ... & Nakagaki, T. (2010). Rules for biologically inspired adaptive network design. *Science*, *327*(5964), 439-442.

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Social networks and resilience to environmental change

Michele L. Barnes
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The scale and magnitude of environmental change is escalating

Image credit: U.S. House of Rep. Sustainable Energy & Environment Coalition

The scale and magnitude of environmental change is escalating

Resilience

Image credit: Getty Images

Image credit: Rand Corporation

Many definitions across many scientific fields

Social science perspective (often applied in environmental studies): *the capacity of social entities (e.g. people) to tolerate, absorb, cope with, and adjust to change*

Keck & Sakdapolrak 2013

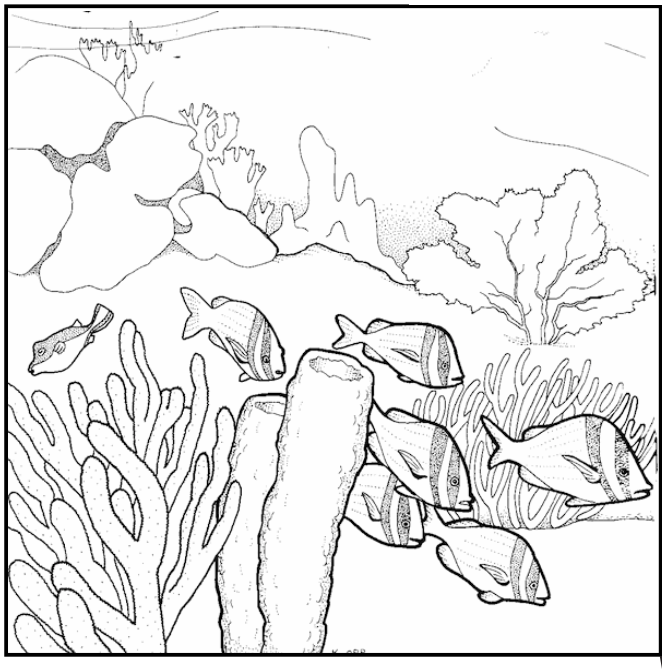
Social-ecological systems/sustainability science: *people are a part of the natural world; resilience thus relies on linked dynamics between people and nature*

Folke 2016

Social-Ecological Systems

Social-Ecological Systems

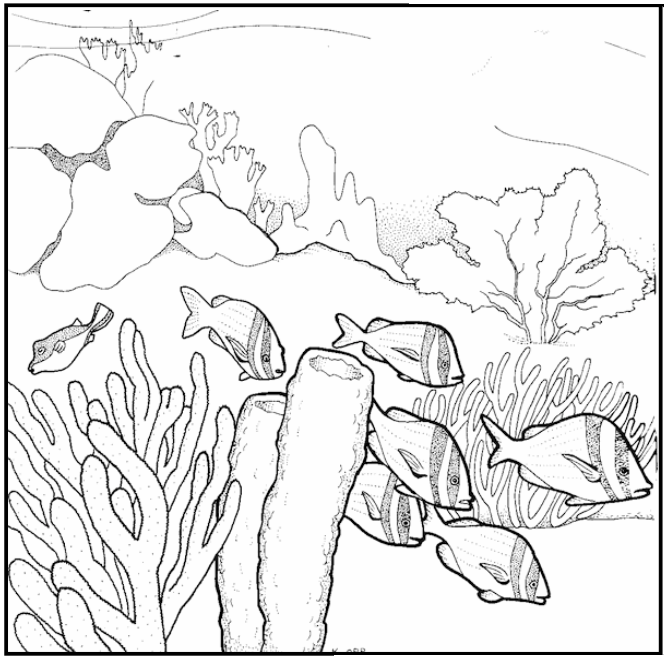
ECOLOGICAL SYSTEMS



Adapted from Kittinger et al. 2012

Social-Ecological Systems

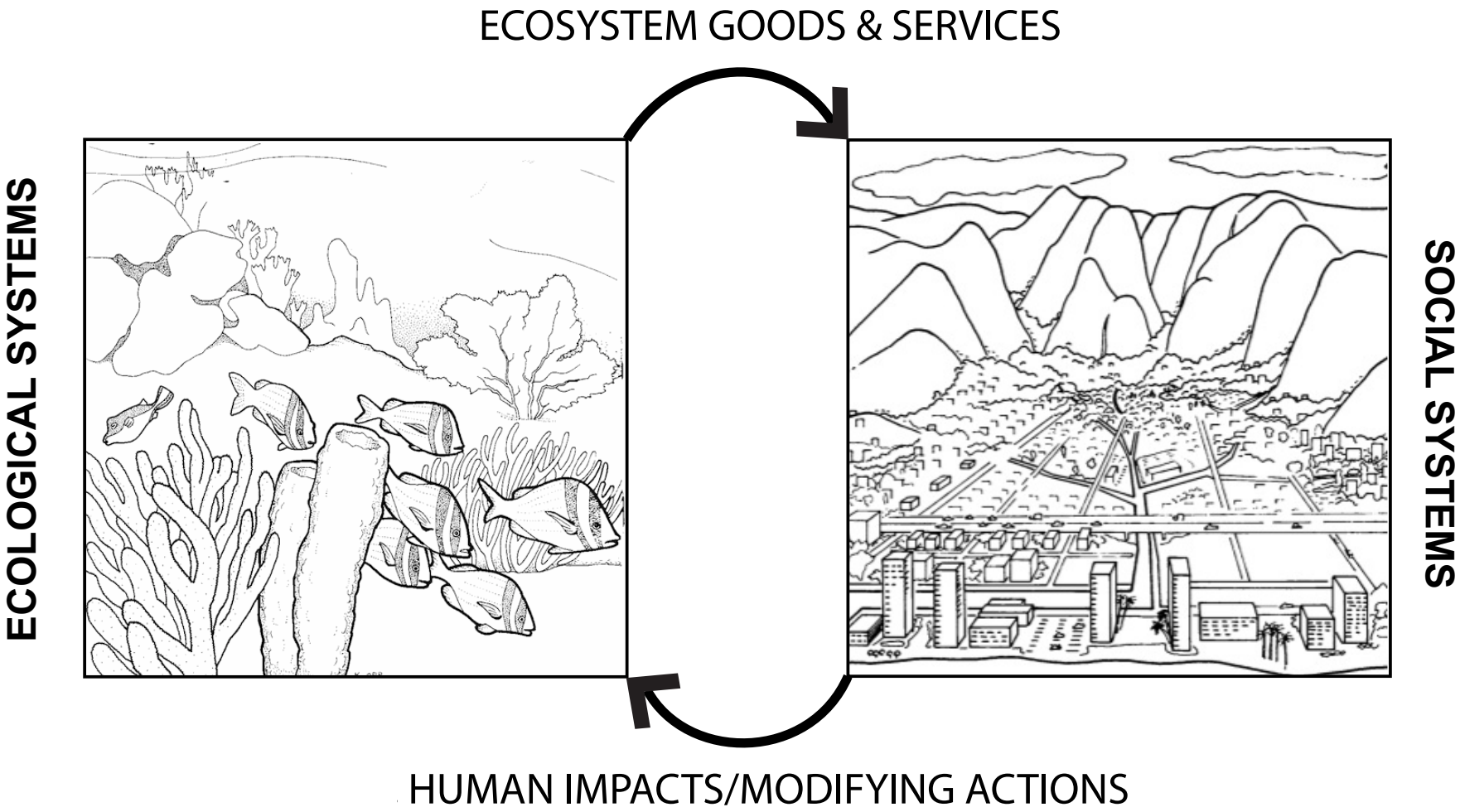
ECOLOGICAL SYSTEMS



SOCIAL SYSTEMS

Adapted from Kittinger et al. 2012

Social-Ecological Systems



Adapted from Kittinger et al. 2012

Resilience from a social-ecological systems perspective

Adaptation

the ability of social–ecological systems to tolerate unknown or unforeseen shocks by absorbing, accommodating, or embracing change

minor to moderate changes to practices or behaviours within existing social-ecological systems (e.g., altering existing livelihood practices, technological fix)

or

Transformation

fundamentally reorganize as a response to challenges that are impossible to address within the current system

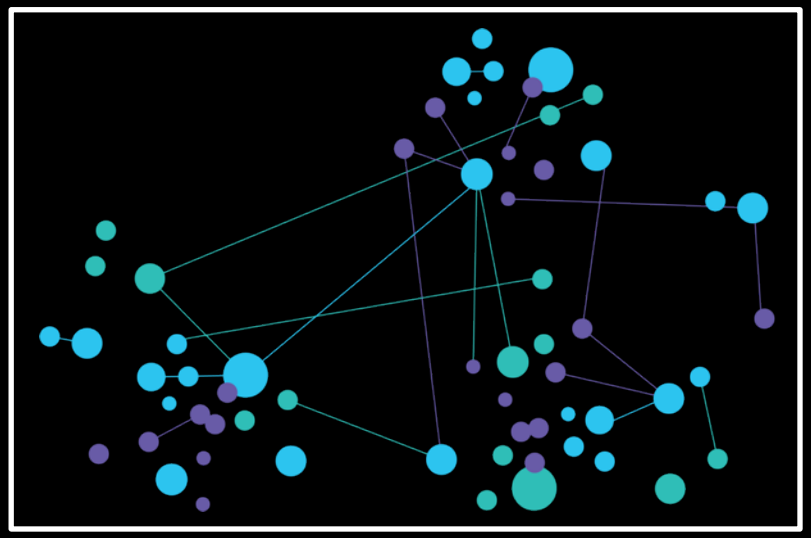
fundamental changes that can alter dominant social-ecological relationships and create new systems or futures (e.g., diversifying livelihoods, dramatic policy shifts)

(Walker et al. 2004, Folke et al. 2010, Barnes et al. 2017, Barnes et al. 2020)

Resilience requires adaptive capacity

Adaptive Capacity: *'the conditions that enable people to anticipate and respond to change, to minimize the consequences, to recover, and take advantage of new opportunities'*

Cinner, Barnes et al. 2018 *Nature Climate Change*



Adaptive Capacity

- Learning
- Resources
- Social support
- Reduce transaction costs

(Barnet 2001; Adger 2003; Tompkins & Adger 2004; Folke et al. 2005; Smit & Wandel 2006)

Social networks and (collective) adaptive capacity

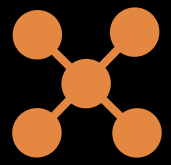
Group-level (e.g., communities, governance systems)

Theories: social capital, collective action

Arguments:

- *Broad network ideas*: connectivity, diversity/heterogeneity, clustering/fragmentation

- *Bridging* networks facilitate coordination, knowledge sharing across scales, and can bring divergent actors together behind common goals



- *Bonding* networsks build trust, enhance learning, facilitate shared (negotiated) agreements, and reduce the transaction costs associated with collective action

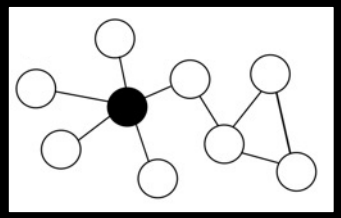
Social networks and (individual) adaptive capacity

Individual actor-level

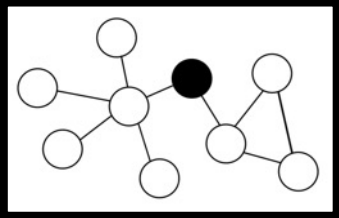
Theories: Social capital, social resource, social influence

Arguments:

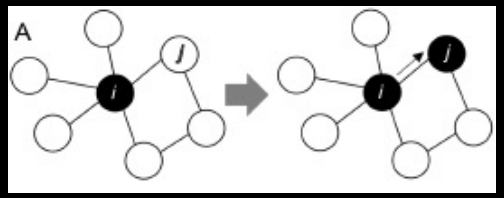
- General connectivity (ties to friends/family) and network prominence (e.g. centrality) provides access to resources & social support



- Brokerage (bridging ties/betweenness) provides access to diverse sources of information & resources, facilitating novel adaptation responses

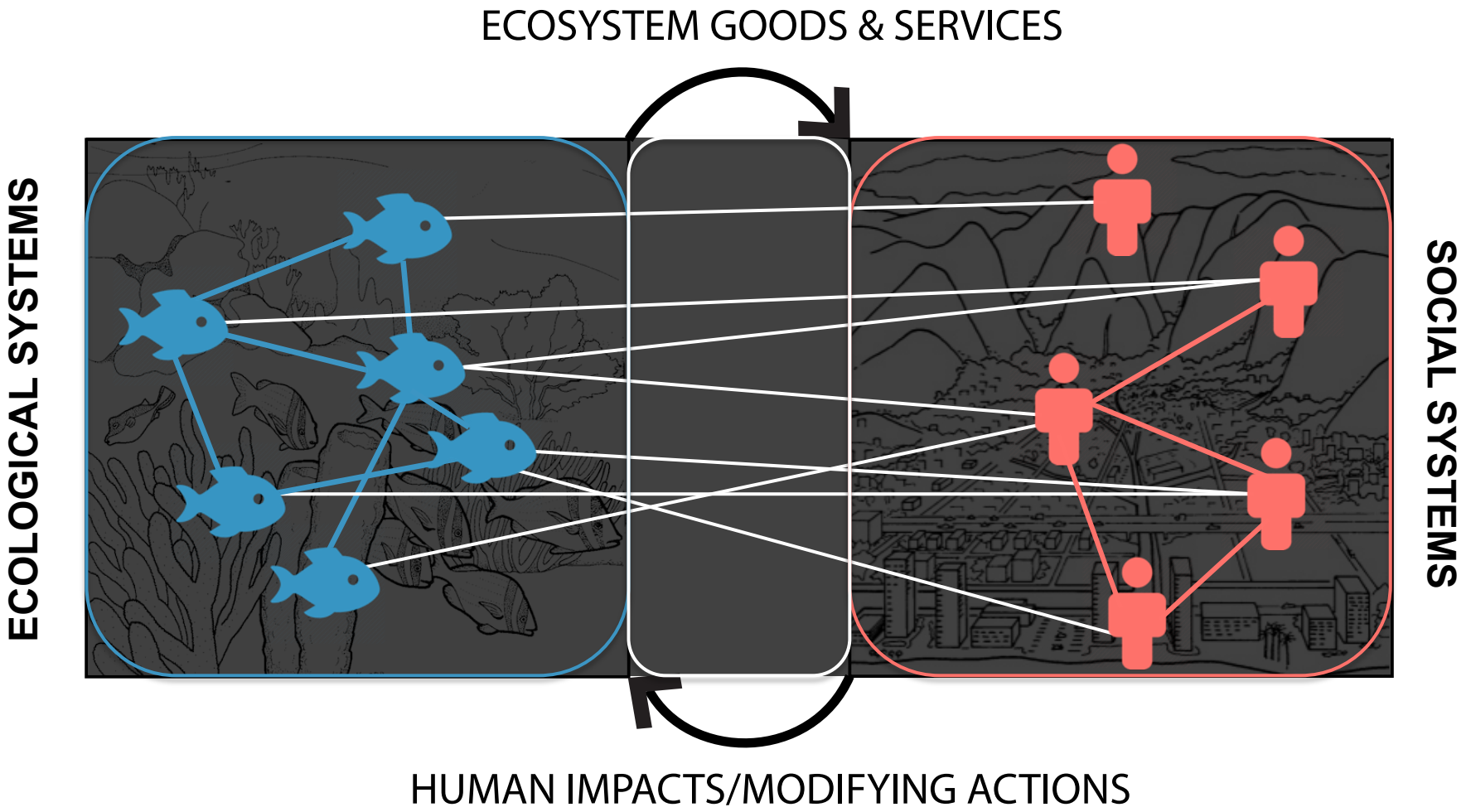


- Social influence can reinforce adaptive behavior, causing it to spread from peer-to-peer

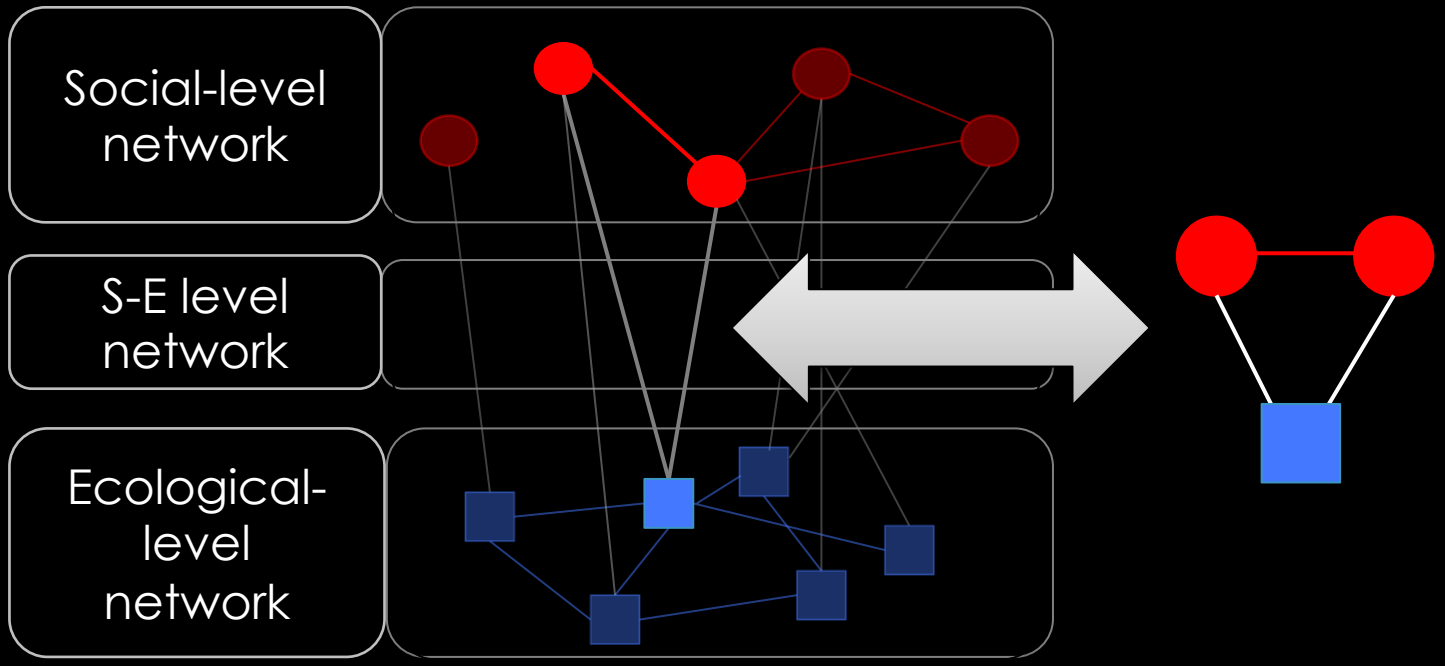


→ power & influence in determining (group-level) response trajectories

Social-ecological systems as social-ecological networks



Key interdependencies:
Social-ecological network configurations



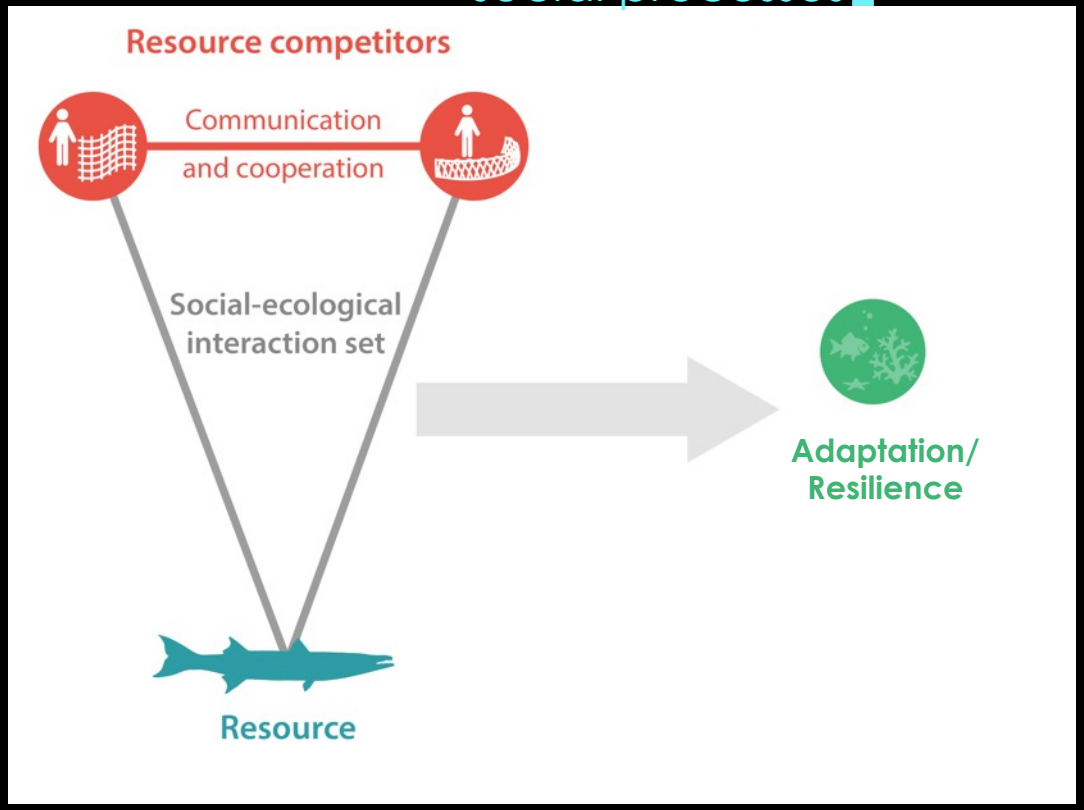
Moreno & Jennings 1938 → social network configurations

Milo et al. 2002 → biophysical network configurations ("motifs")

Bodin & Tengö 2012 → social-ecological network configurations

'Social-ecological network closure'

social processes



Trust, Learning, Common Norms & Sanctions

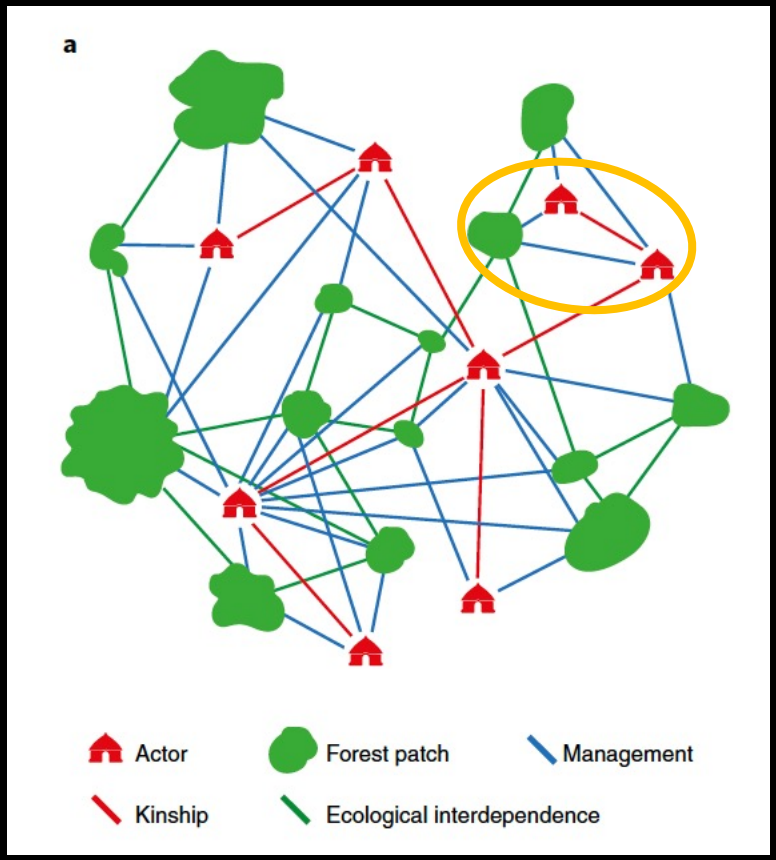
Cartwright & Harary 1956, Granovetter 1992, Robins et al. 2011

Sally 1995, Kollock 1998, Balliet 2010

Barnes et al. 2019 *Nature Communications*

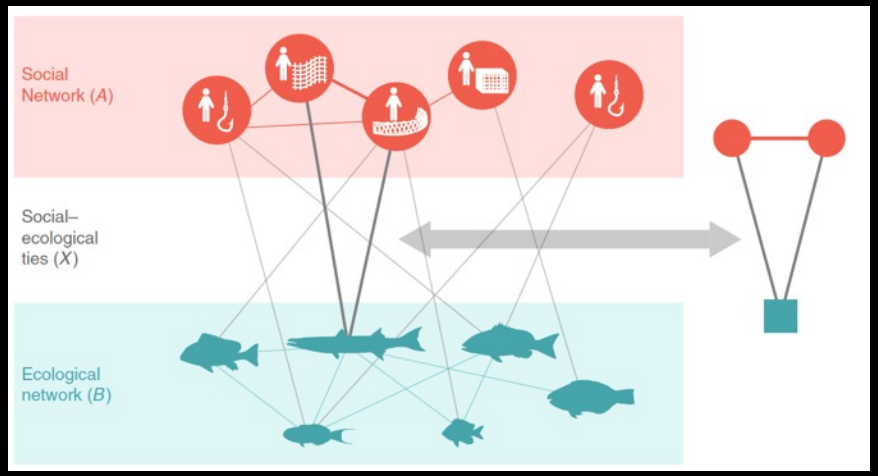
Empirical examples: group level

Forests in Madagascar



Bodin &Tengo 2012, Bodin et al. 2014, Bodin et al. 2019

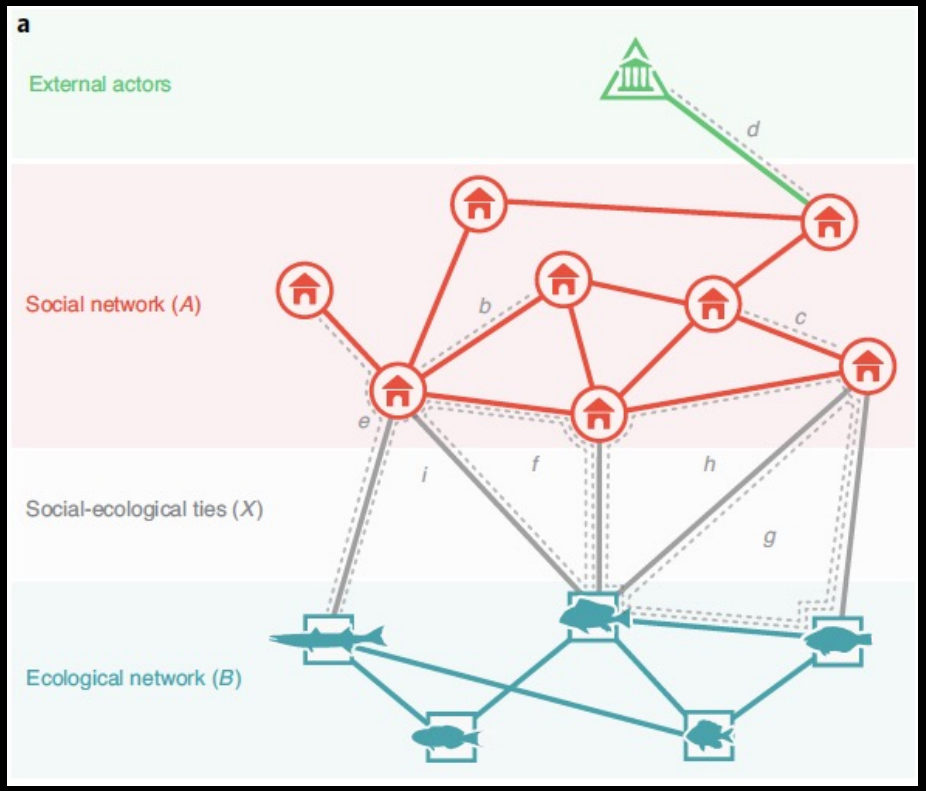
Fisheries in Kenya



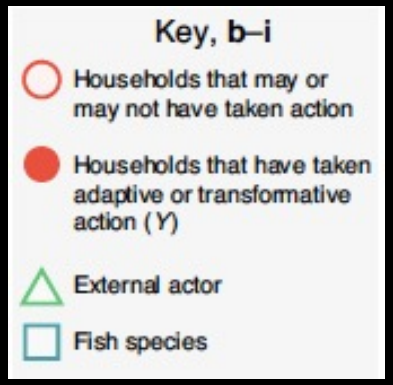
Barnes et al. 2019

Empirical examples: individual level

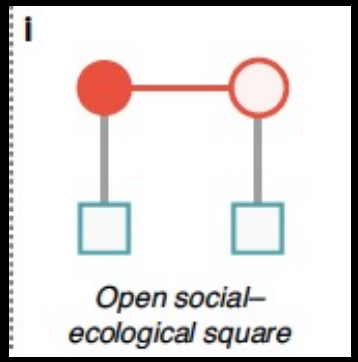
Climate adaptation/transformation in Papua New Guinea



Barnes et al. 2020 *Nature Climate Change*

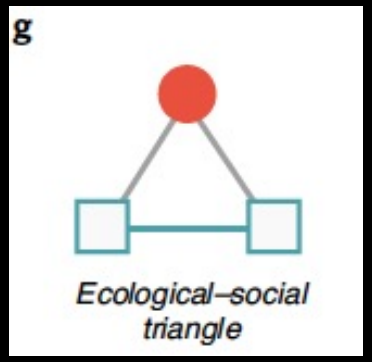


Adaptation



social learning

Transformation



personal experience

Johannes 1989, Reed et al. 2010, Bodin et al. 2014

So what?

Social and social-ecological networks are critical for building adaptive capacity and resilience

which enables disaster preparedness, response, recovery, and prevention

Thank you

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ARC Centre of Excellence for Coral Reef Studies, James Cook University

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Beyond Bushfires Recovery Matters webinar series

Q & A session

Don’t forget to enter your questions into the Q&A box.

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Children, families and schools
Exploring the 10 Years Beyond Bushfires Report
20 October, 2021
2pm AEDT
aidr.org.au/events
SPEAKERS
Professor Lisa Gibbs, University of Melbourne
Jane Nursey, Phoenix Australia
Bron Sparkes, Surivor of the 2009 Black Saturday

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Event concludes

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www.beyondbushfires.org.au

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Beyond Blue: 1300 224 636

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Further resources:
knowledge.aidr.org.au/recovery

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Dr Colin Gallagher, University of Melbourne
Dr Michele L Barnes, James Cook University
HOSTED BY
Amanda Leck, AIDR