Leveraging Social Capital to Access Resources

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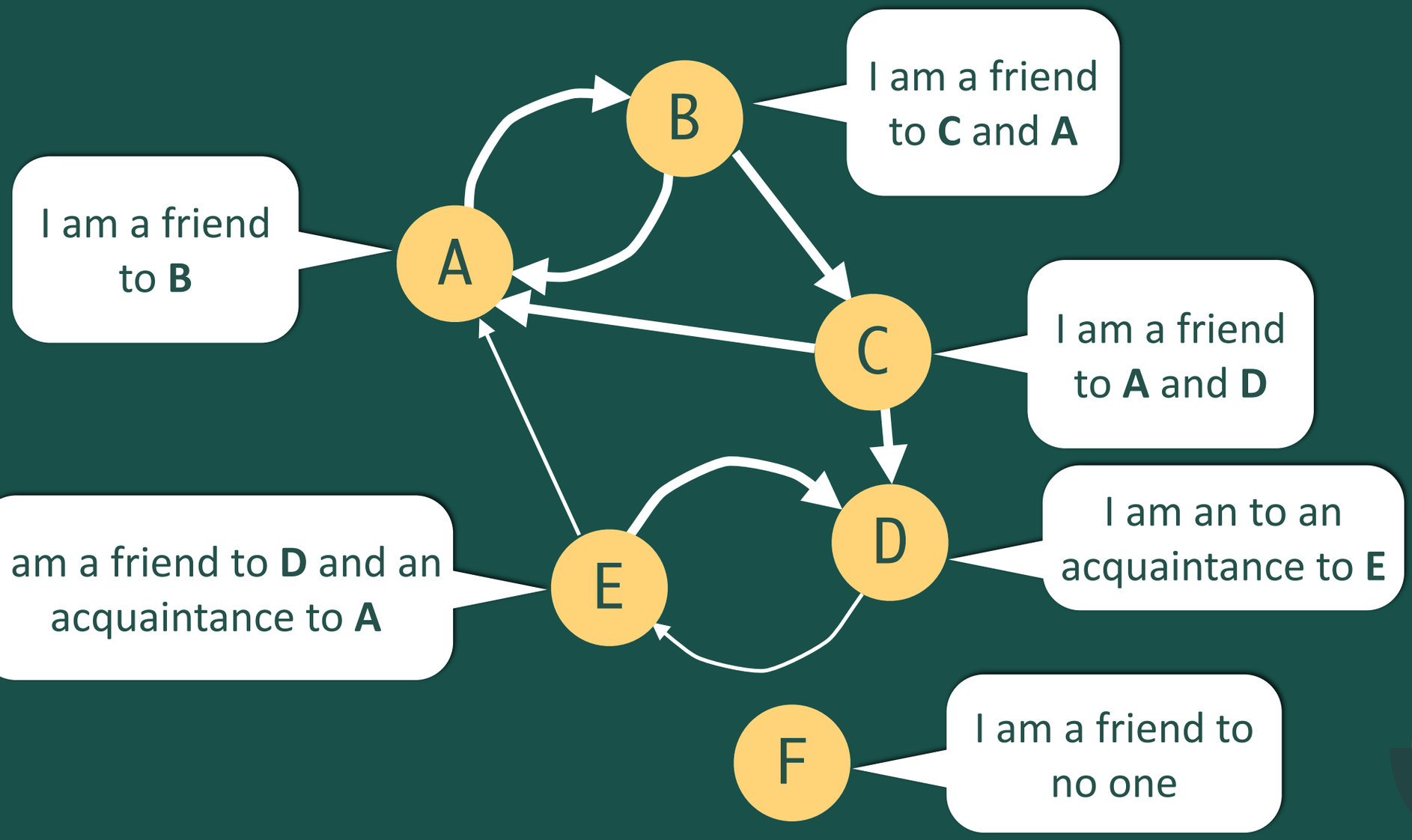
Introduction

- **Computational Social Science**
- **Social Capital** - our networks can provide value
- **Social Capital and Social Resources**
  - *Access* to and *use of* resources (assets) embedded in social networks - Lin 2001
- **Social Capital Framework**
  - Relationships (ESN), Affinities (IAN), and *Resources*

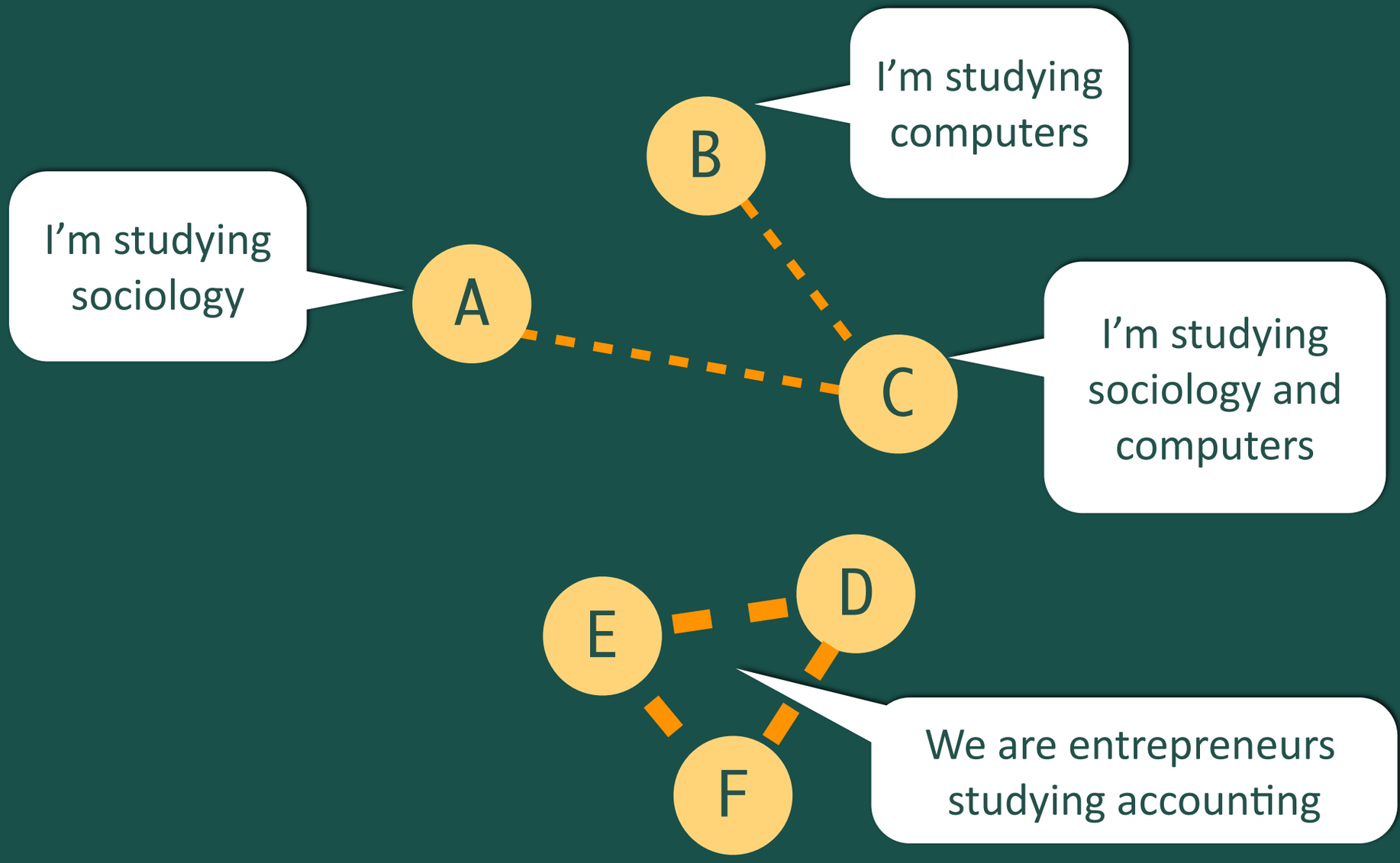
Framework: ESN

- Explicit Social Network (ESN)



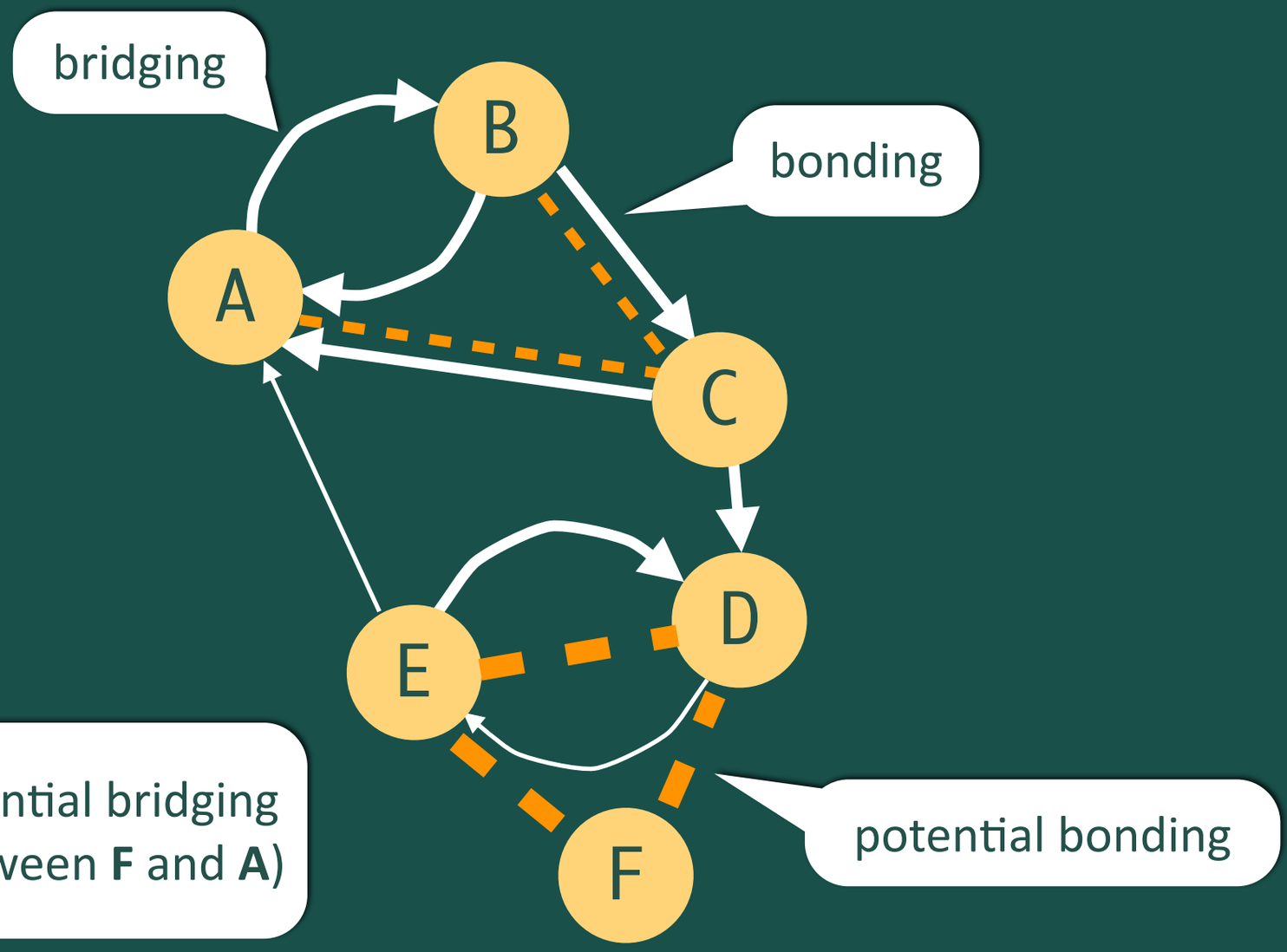
Framework: IAN

- Implicit Affinity Network (IAN)



Smith, M., Giraud-Carrier, C. and Judkins, B. (2007). Implicit Affinity Networks. In Proceedings of the Seventeenth Annual Workshop on Information Technologies and Systems, 1-6.

Framework



Smith, M., Giraud-Carrier, C., and Purser, N. (2009). Implicit Affinity Networks and Social Capital. Information Technology and Management, 10(2-3):123-134, September.

Resources

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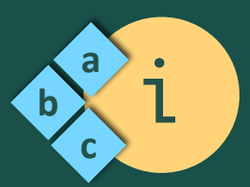
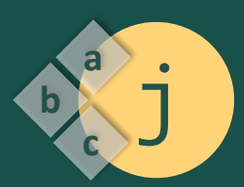
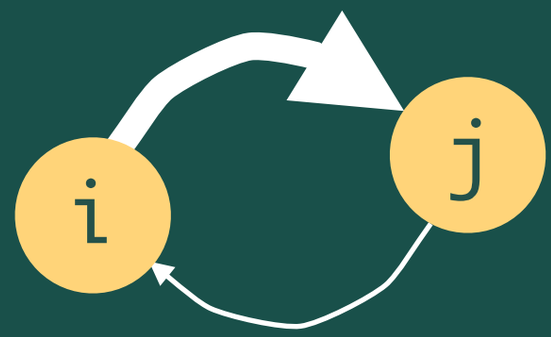
- **Social resource** - a specific asset, material or symbolic, available through social connections within a network
- **Characteristics** - examples: (e.g., exhaustible, returnable, quantifiable, durable)
- **Value** - assigned by the individual (often dependent on characteristics)
- **Possessed or Sought**





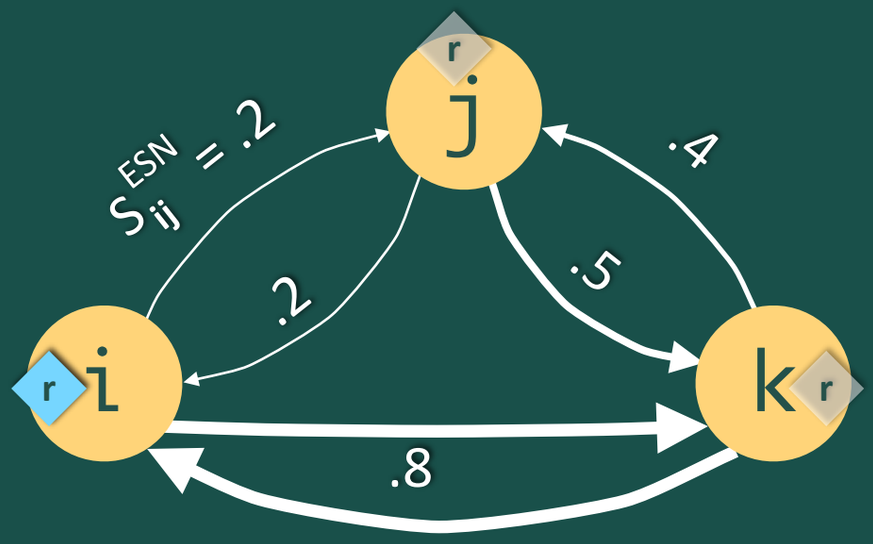
Relationships

- Directed
- Strength



- *Initialization*: Behavioral interaction, evaluation of one person by another, formal relationships, biological relationships; base on affinities
- *Dynamic*: interactions, time decay

Access to Resources

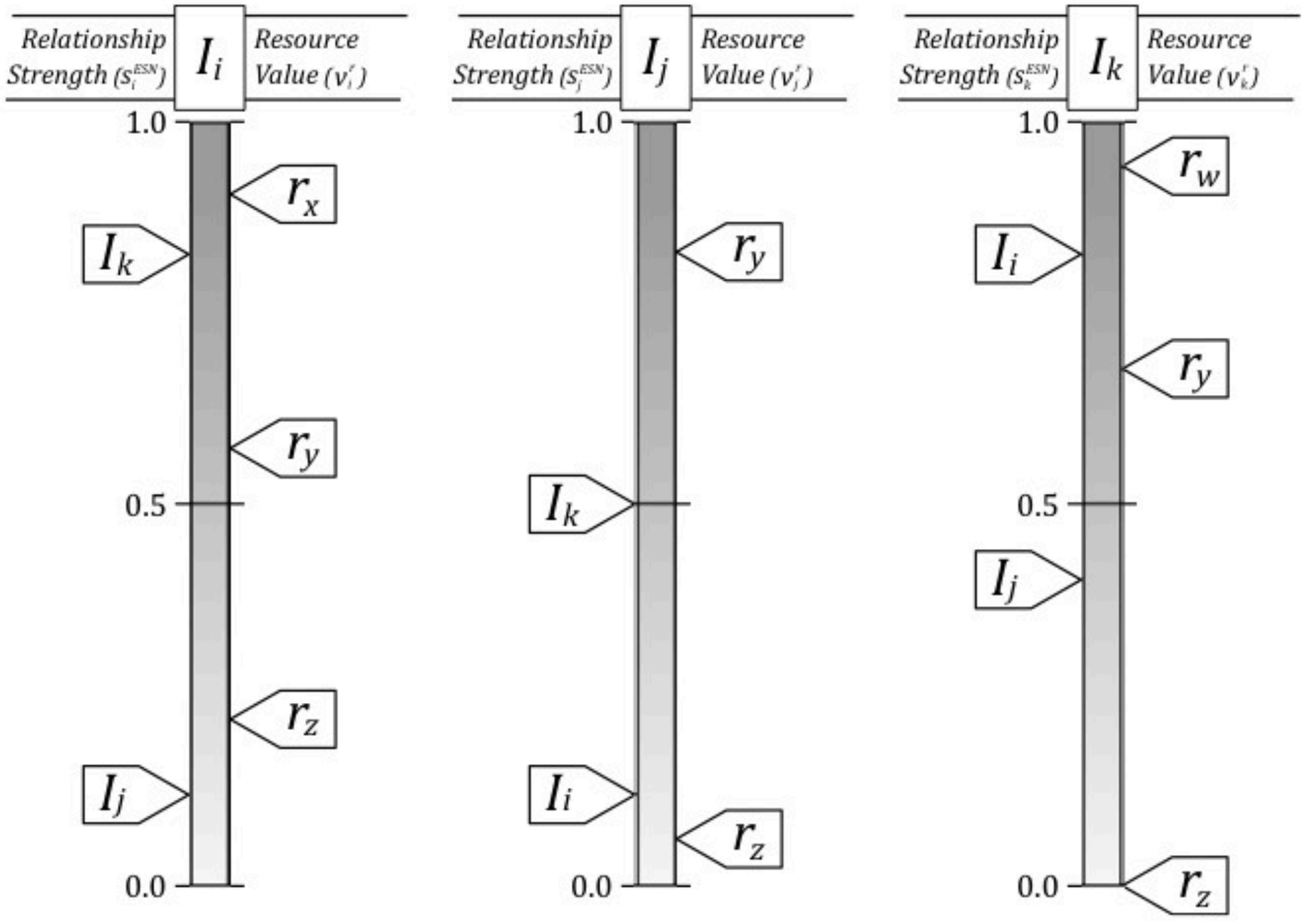


.8

$v_i^r = 0.4$

$$access_j(i,r) = \begin{cases} True & \text{if } s_{ij}^{ESN} \geq v_i^r \\ False & \text{otherwise} \end{cases}$$

Resource Access Spectrum



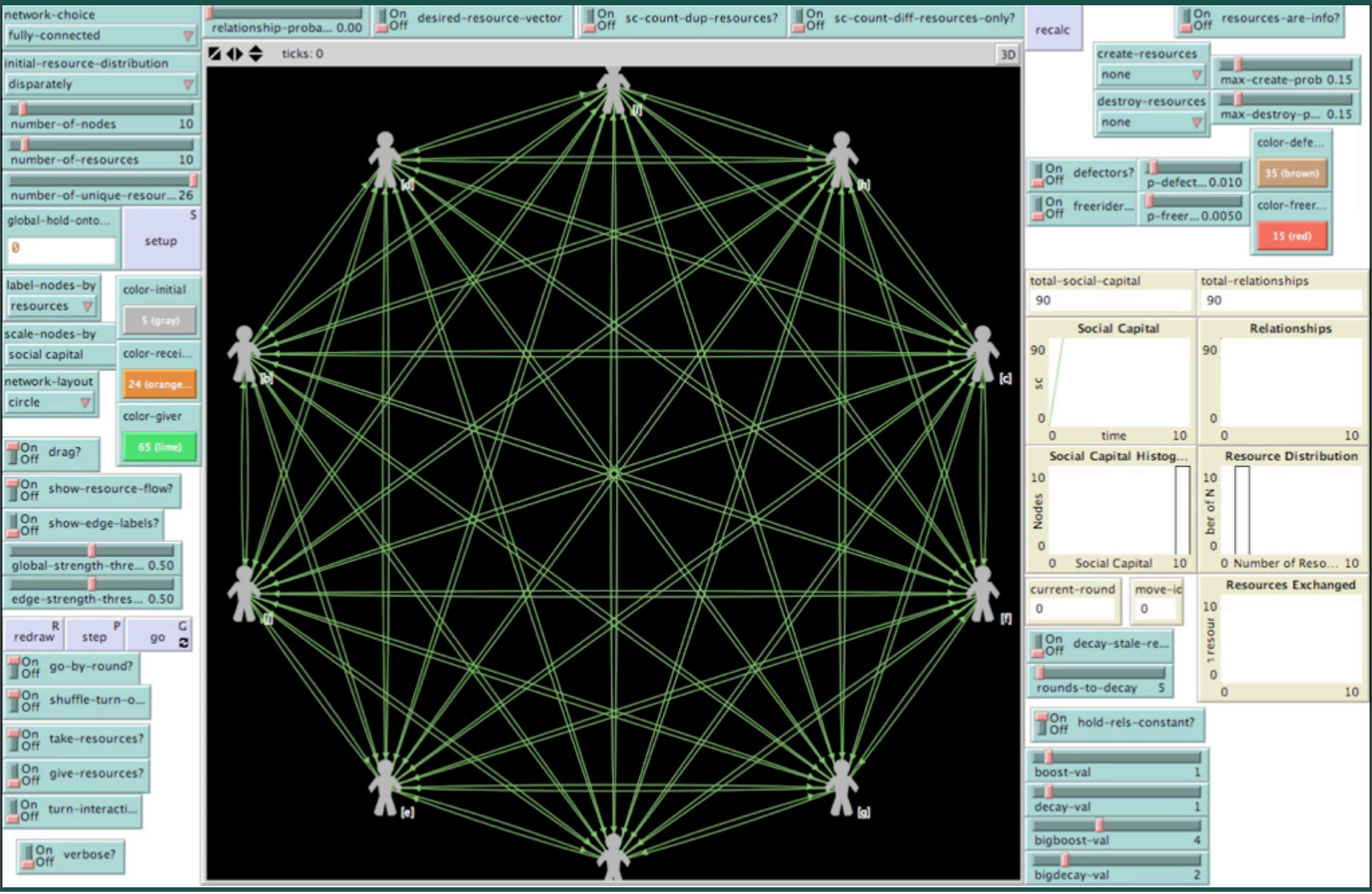
Comparison of SCF

to Popular Applications

Feature	FB	TW	LI	FC	SW	SCF
relationships						
simple (friend or not)	✓	✓	✓			✓
complex (strength)						✓
asymmetric		✓				✓
dynamic						✓
affinities						
simple (like or not)	✓		✓			✓
complex (how much)						✓
resources						
desired by ego				✓	✓	✓
desired by others				✓		✓
available by ego				✓	✓	✓
...willing to give				✓	✓	✓
...to specific others						✓
available by others				✓	✓	✓
...willing to give				✓	✓	✓
...to ego						✓
dynamic rel. (on exchange)						✓
...update on giving						✓
...update on receiving						✓

Example Experiment:

NetLogo Simulation



Summary

- Presented general framework that:
  - Leverages relationships, affinities, and resources
  - Operationalizes SC in online communities
- Compared SC framework to popular applications
- Showed an example experiment highlighting interesting boundary cases

Case Studies

- Social Capital in the Blogosphere: A Case Study (published in *Papers from the AAAI Spring Symposium on Social Information Processing*)
- Bonding vs. Bridging Social Capital: A Case Study in Twitter (published in *International Symposium on Social Intelligence and Networking*)
- Identifying Health-Related Topics on Twitter (published at *International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction* - SBP11)
- Social Capital and Language Acquisition during Study Abroad (submitted to Cognitive Science, 2011)

Questions & Comments

Ask me now:

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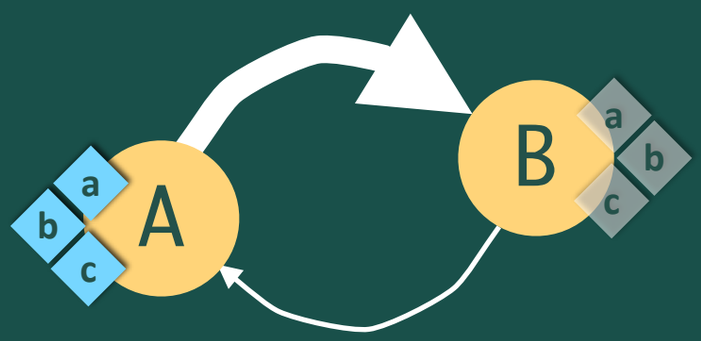
Extra Slides

Reciprocity



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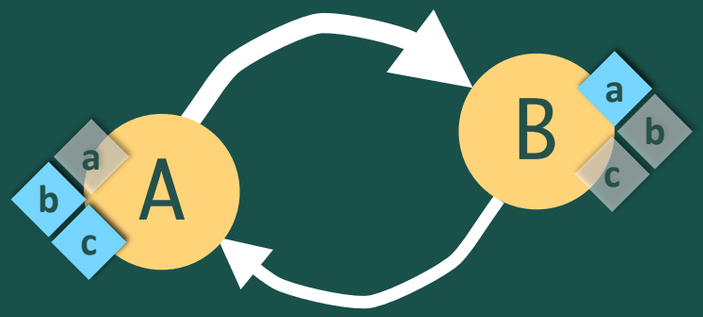

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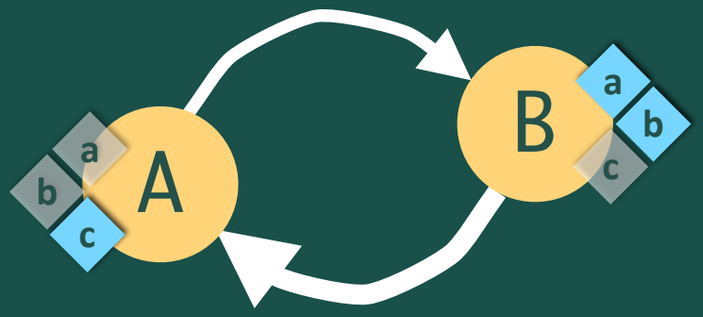

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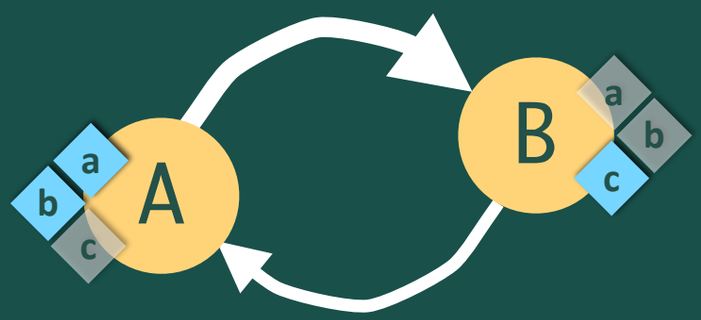

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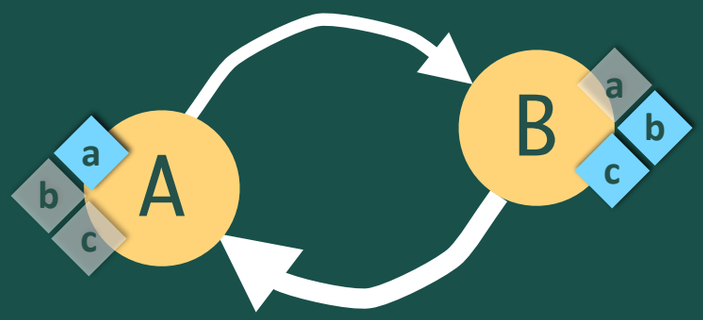

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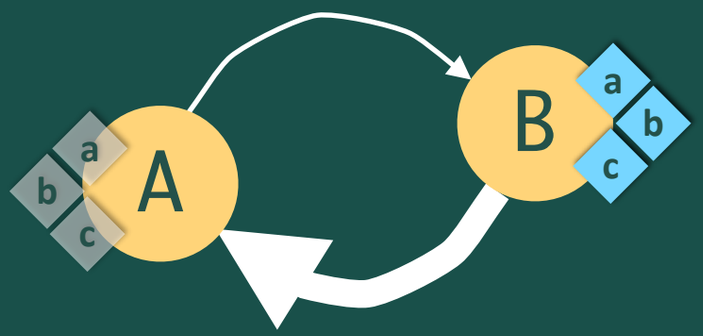


Interactions

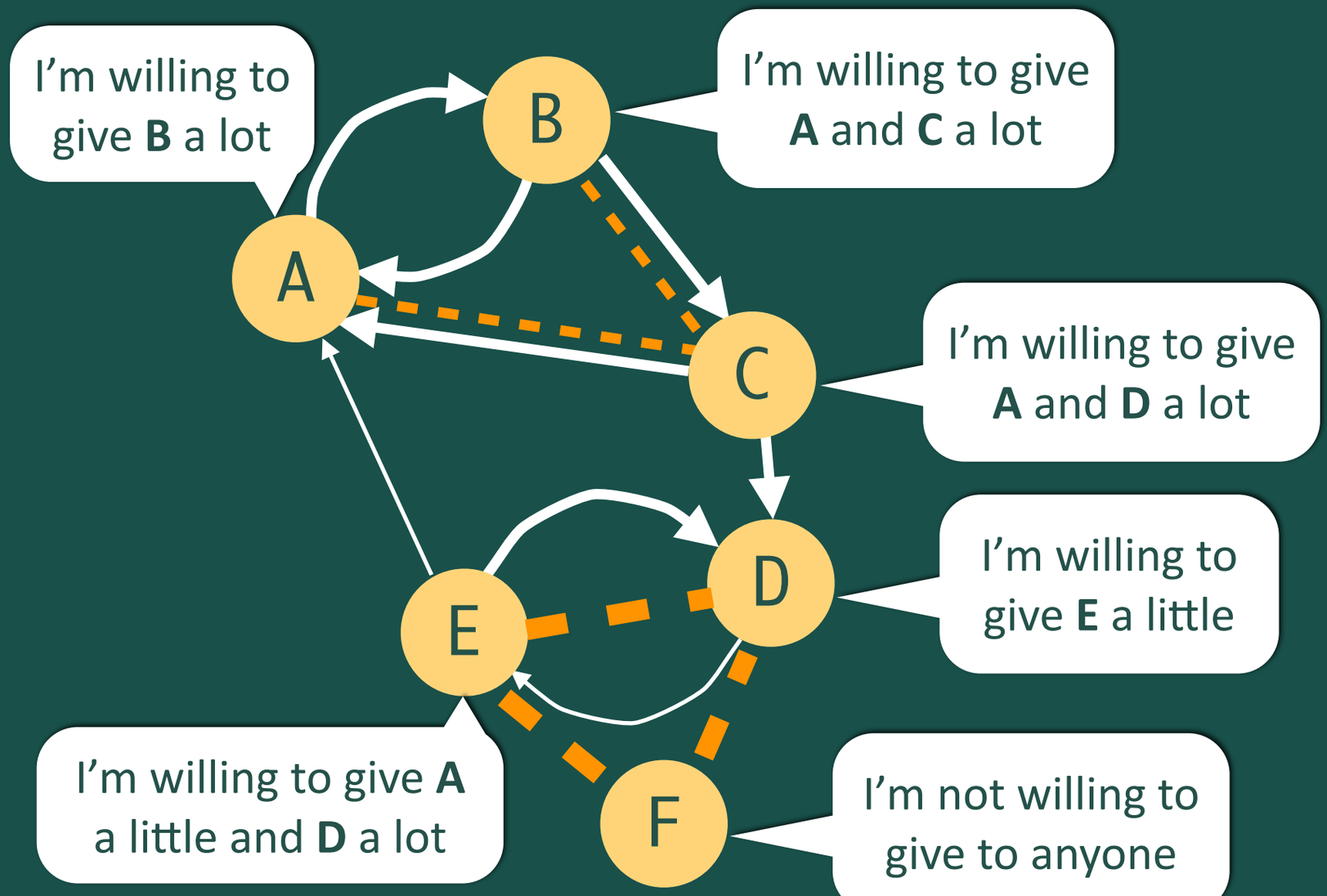
- How is it perceived? (+, -, or neutral)
- Is a resource involved?
- Who to interact with?

$$i = sel_j(R_i^p, R_j^s, s_{ij}^{ESN}, s_{ij}^{IAN})$$

where

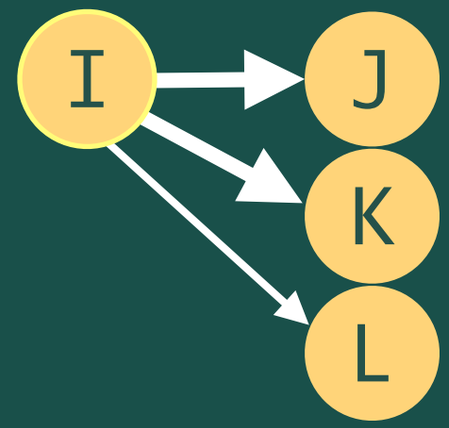
R_i^p	:	Set of resources currently possessed by i
R_j^s	:	Set of resources currently sought by j
s_{ij}^{ESN}	:	Strength of the explicit link from i to j
s_{ij}^{IAN}	:	Strength of the implicit affinity between i and j

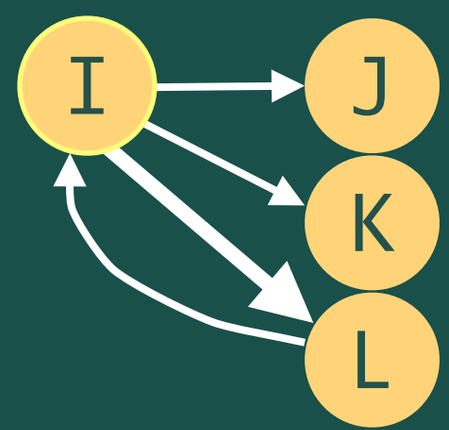
Framework


I’m willing to give **B** a lot
B
I’m willing to give **A** and **C** a lot
A
C
I’m willing to give **A** and **D** a lot
D
I’m willing to give **E** a little
E
I’m willing to give **A** a little and **D** a lot
F
I’m not willing to give to anyone

Relationship Strength Modeling

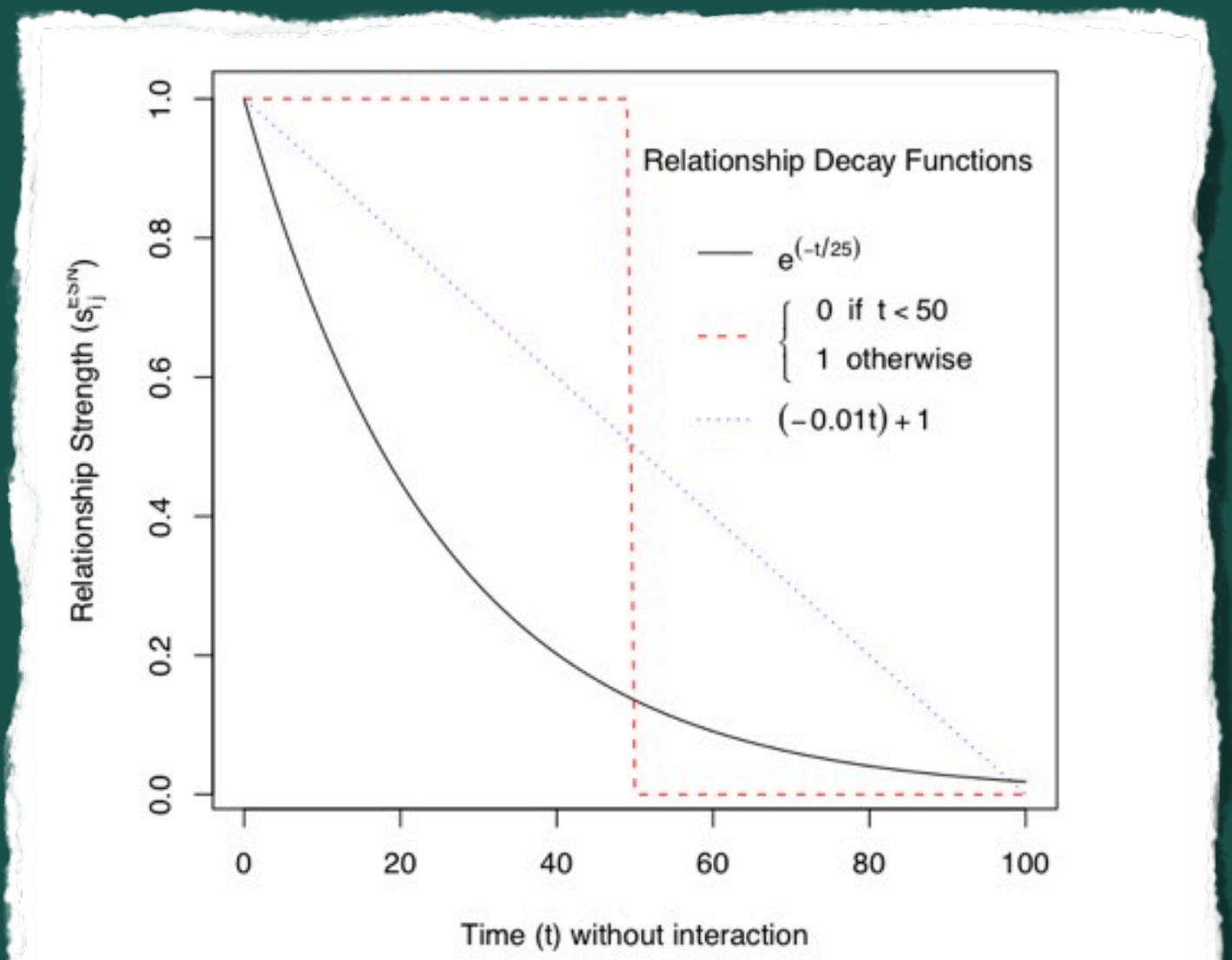
- Initialized individually
  - Frequency of interaction (data)
  - Relationship roles (e.g., friend, acquaintance)
- Dynamic
  - Strengthens by interaction
  - Weakens by lack of interaction



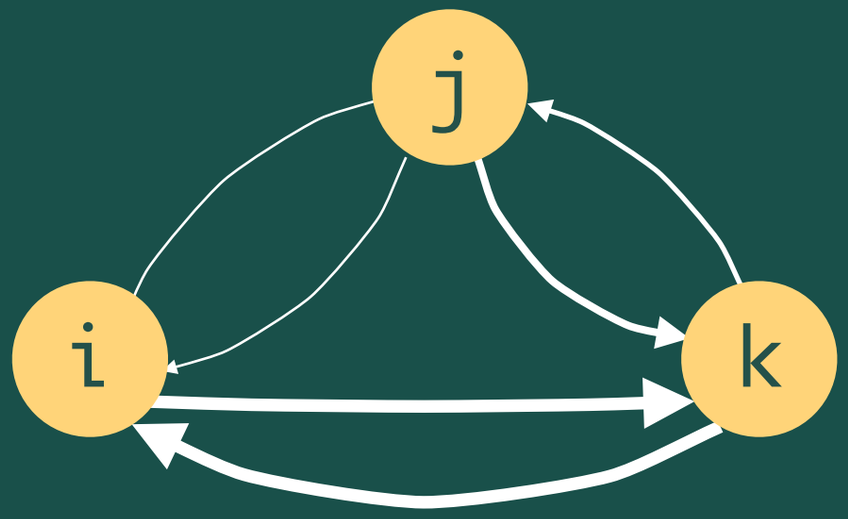


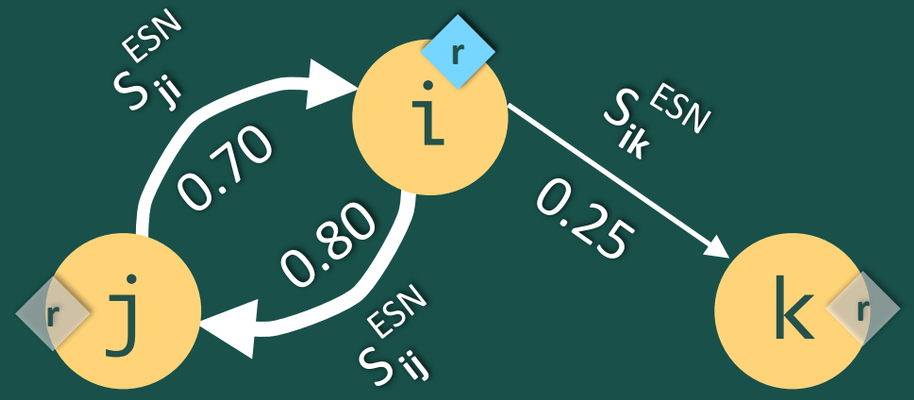
Relationship Decay

Example Functions



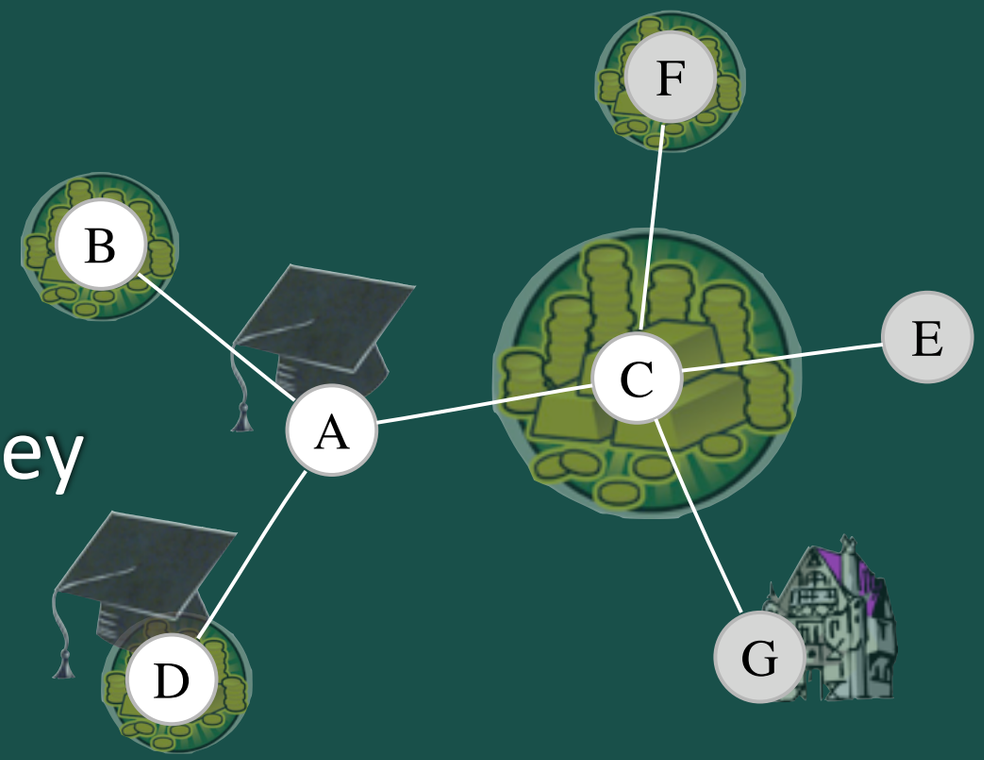
Access and Mobilization





Social Resource Examples

- Material Goods
  - land, houses, car, and money
- Symbolic Goods
  - education, memberships in clubs, honorific degrees, nobility or organizational titles, family name, reputation, or fame



From: Lin 2001, Social Capital: A Theory of Social Structure and Action