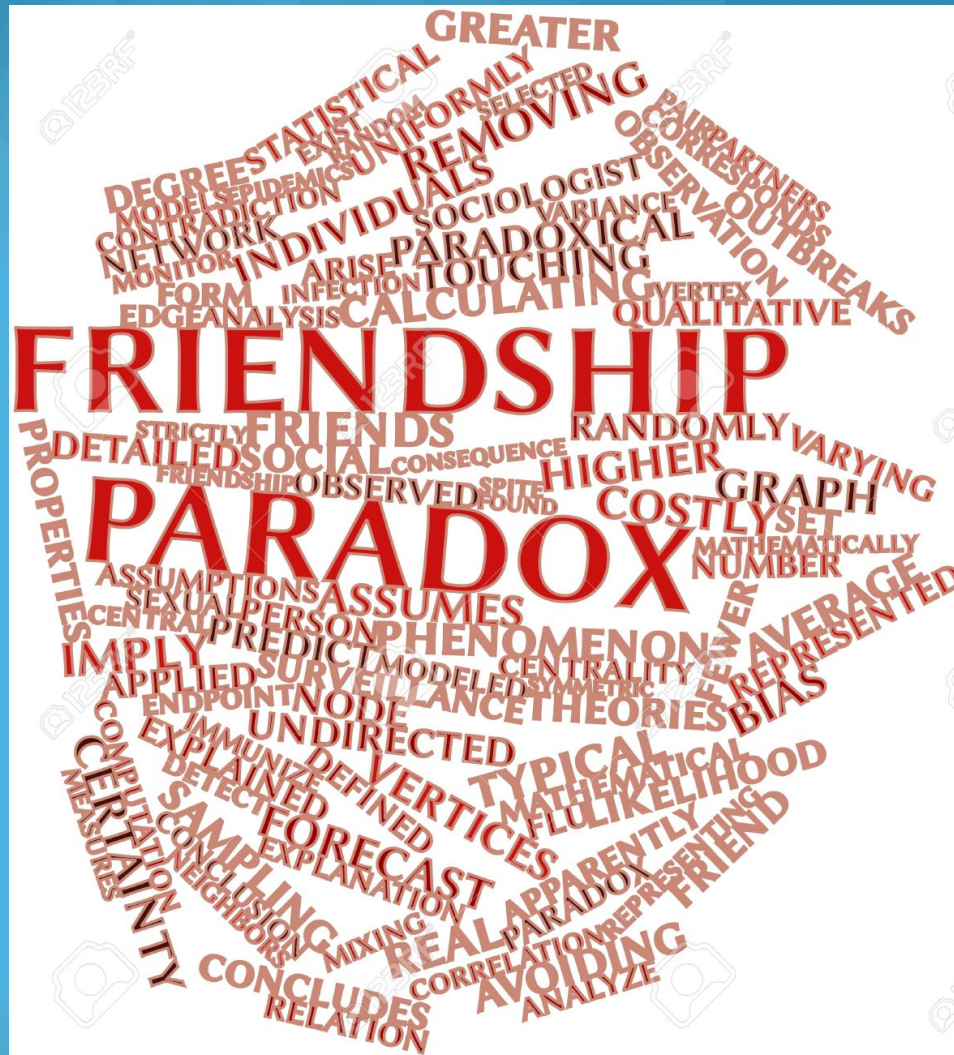




## Modelling Social Interaction in Information Systems (MSIIS)

Lecturer: Dr David Hales

2015

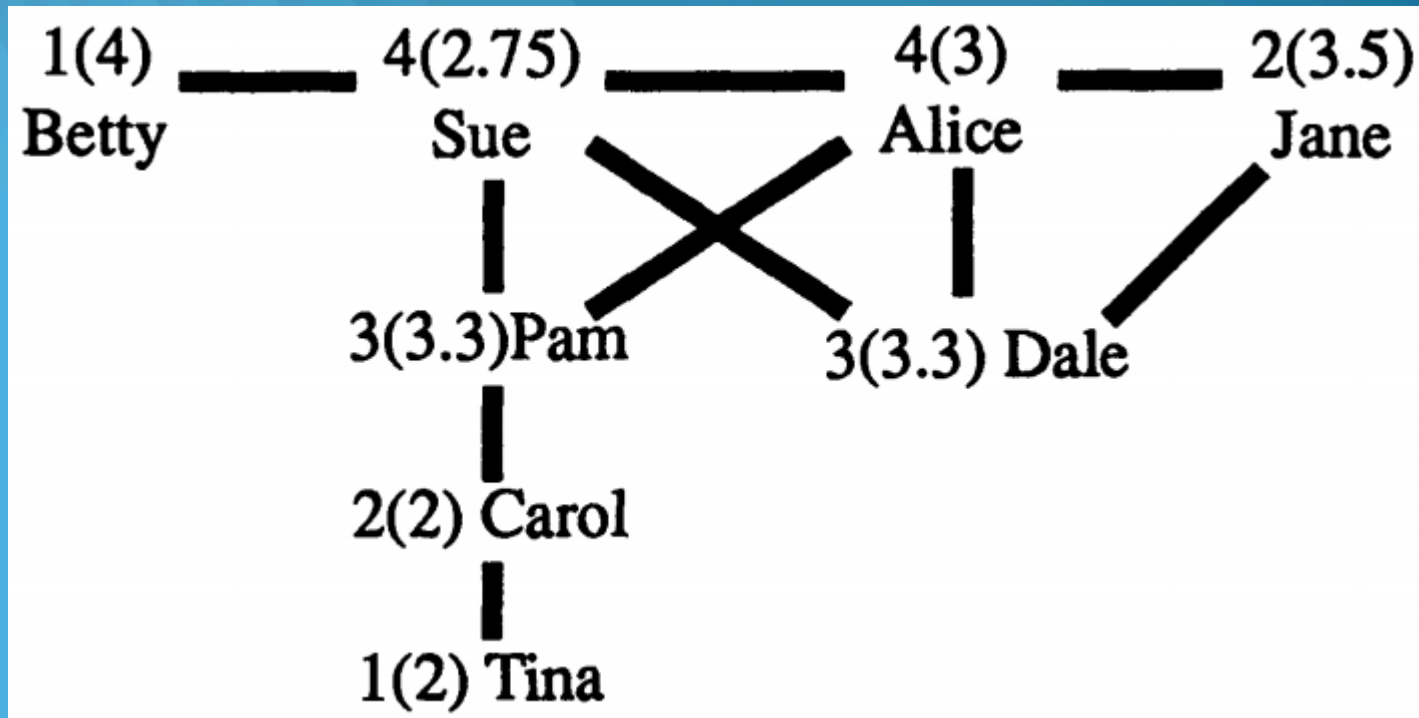


Scott L. Feld:  
Why Your Friends Have More  
Friends Than You Do

<http://www.jstor.org/stable/2781907>

Tamás Pflanzner  
University of  
Szeged  
PhD student

## James Coleman's (1961) study 12 high schools



More friends: Sue and Alice  
Same: Carol  
Fewer: 5 girls

146 girls:

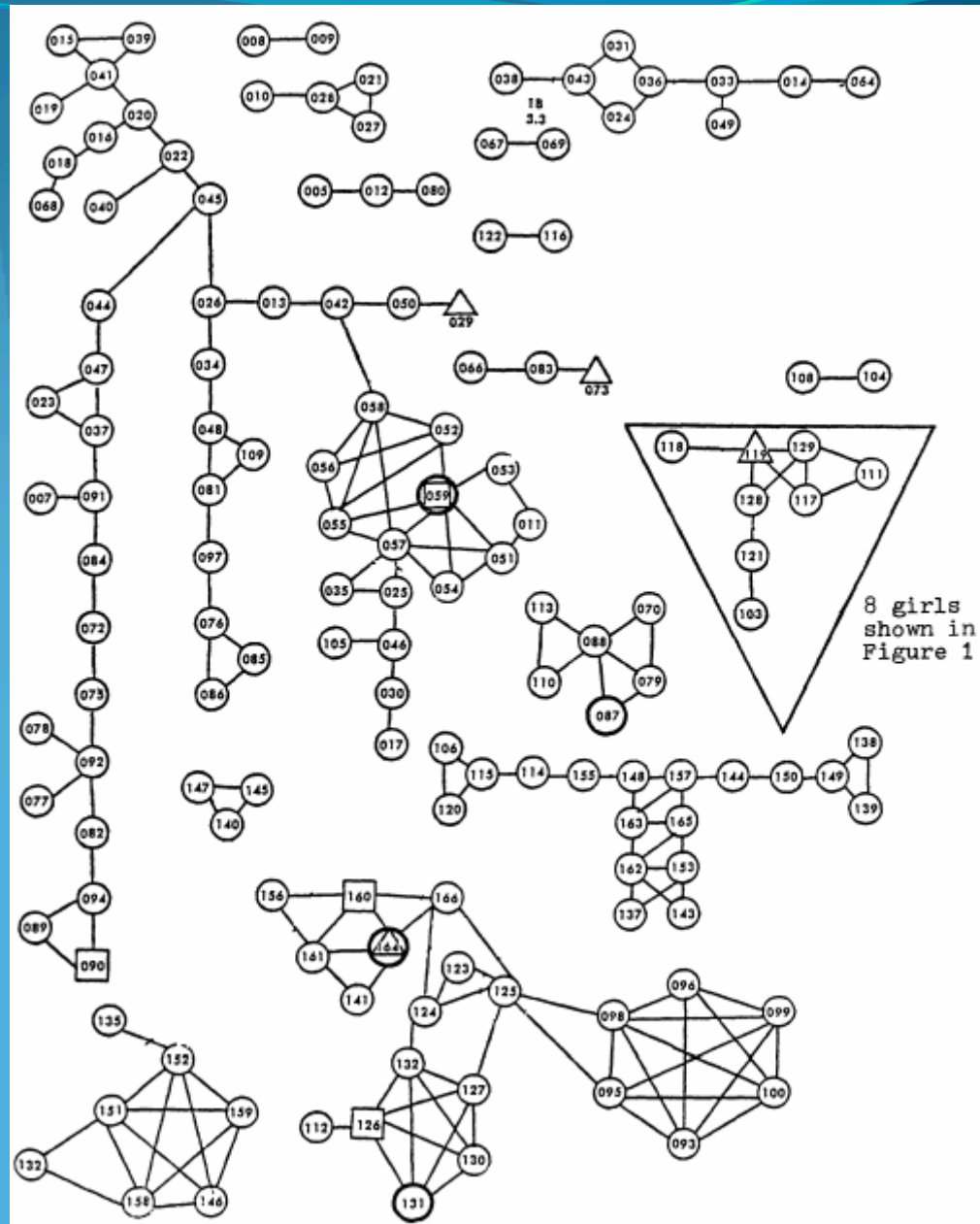
Fewer: 80

Same: 25

More: 41

Same pattern:

- boys
- girls and boys
- other schools



# Modelling Social Interaction in Information Systems (MSIIS)

Scott L. Feld and Bernard Grofman:

Variation in Class Size, the Class Size Paradox, and Some Consequences for Students

[http://www.jstor.org/stable/40195170?seq=1#page\\_scan\\_tab\\_contents](http://www.jstor.org/stable/40195170?seq=1#page_scan_tab_contents)

**100 students**

**class1: 90**

**class2: 10**

**average: 50**

**form: how big is your class?**

**90X : 90**

**10X : 10**

$$90 \times 90 + 10 \times 10 =$$

$$8100 + 100 =$$

$$\underline{8200}$$

$$90 + 10 = \underline{100}$$

$$8200 / 100 = \mathbf{82}$$

Gym

Others are in better shape.

They're the types who spend time at the gym

The sample of the gym's membership is not representative.

This is also why people experience airplanes, restaurants, parks and beaches to be more crowded than the averages would suggest. When they're empty, nobody's there to notice.

50 (average) vs 82 (weighted average)



# Modelling Social Interaction in Information Systems (MSIIS)

Johan Ugander, Brian Karrer, Lars Backstrom, Cameron Marlow:  
The Anatomy of the Facebook Social Graph  
<http://arxiv.org/abs/1111.4503>  
(2011)

- 721 million Facebook user, 10% of the population.
- Facebook is nearly fully connected, with 99.91% of individuals belonging to a single large connected component.
- Average user's friends: 190
- Average user's average friends: 635

The Pew Research Center's Internet & American Life Project  
Why most Facebook users get more than they give  
(2011)

- Average person has 245 friends
- Average friend of a person has 359 Facebook friends
- More friends than friend's average friends: 10%
- Reach: Average of more than 150,000 Facebook users through their Facebook friends.



Nicholas A. Christakis, James H. Fowler  
Social Network Sensors for Early Detection of Contagious  
Outbreaks

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0012948>

An early warning system for detecting outbreaks of flu and other contagious diseases

Reuven Cohen, Shlomo Havlin, Daniel ben-Avraham:  
Efficient Immunization Strategies for Computer Networks and Populations

- The idea is to immunize the friends of random nodes, rather than the nodes themselves
- also be relevant to dismantling terrorist networks: “Our findings suggest that an efficient way to disintegrate the network is to focus more on removing individuals whose name is obtained from another member of the network.”

