Social and Information Networks

Tutorial #3: Social Influence

University of Toronto CSC303
Winter/Spring 2024
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Week 4: Jan 29-Feb 2

Today's agenda

In lecture we've covered Chapter 4 of the textbook looking at Selection and Social Influence.

Today:

- Questions from Lecture
- Accessing NetLogo remotely
- Examples of Selection vs. Social Influence
- Quercus Quiz

Questions?

Accessing NetLogo remotely

Instructions on various ways to remotely access a graphical interface for the teach.cs labs can be found at the CS teaching labs website:
`https://www.teach.cs.toronto.edu/faq/#GS3`

You will need this for Assignment 1 to run NetLogo.

On Linux:

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Demo time!

Homophily

Can we think of examples where we might see homophily? How could influence or selection drive homophily in these examples?

Examples: Obesity & Divorce

Homophily has been observed in both obesity and divorce; this was studied by (Christakis et al.) and (McDermott et al.) respectively.
The observed homophily could be due to Influence, Selection, or Confounding variables (e.g. sharing a local economic downturn). What do we think?

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They used a longitudinal dataset from the Framingham Heart Study. They used tracking forms where the participants listed contact friends & family to create the social network. Consequently these friendships are directed; can we use this?

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- Influence should also be directional!

Examples: Obesity & Divorce

Both studies were looking for influence.

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- This doesn't control for selection! Maybe this prediction works, only because the friendship formed when they were already similar.

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- If we can predict someone's BMI from that of their friends purely due to selection, then:
  1. They became friends when they were similar.
  2. They haven't changed since.

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- If we can predict someone's BMI from that of their friends purely due to selection, then:
  1. They became friends when they were similar.
  2. They haven't changed since.
- Therefore, we should be able to predict just as well from their past self!

Examples: Obesity & Divorce

- Looking for influence
  - Can we predict a node's state from its friends' states?
    - ★ Control for confounding by checking if direction of relationships had an impact
    - ★ Control for selection by conditioning at the node's previous state

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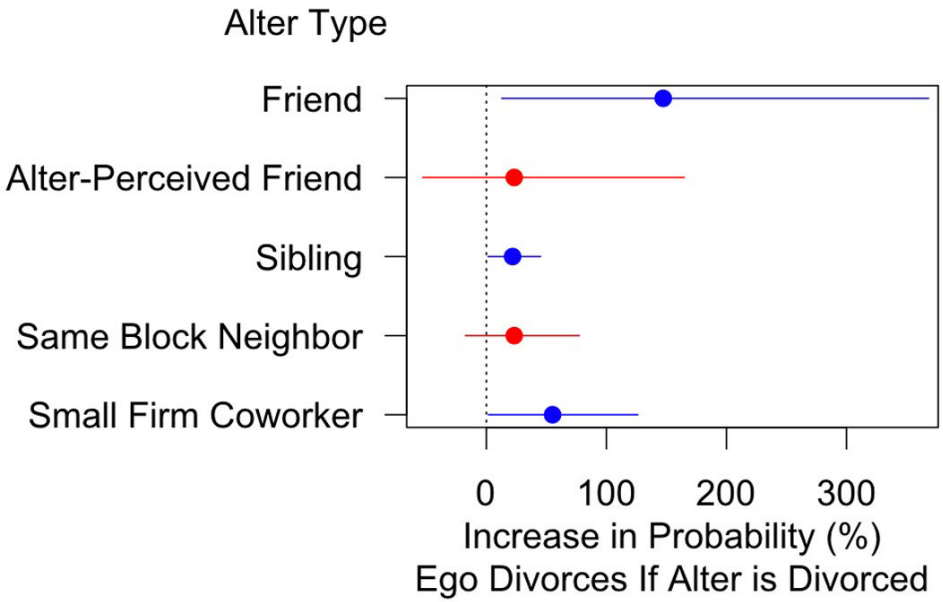
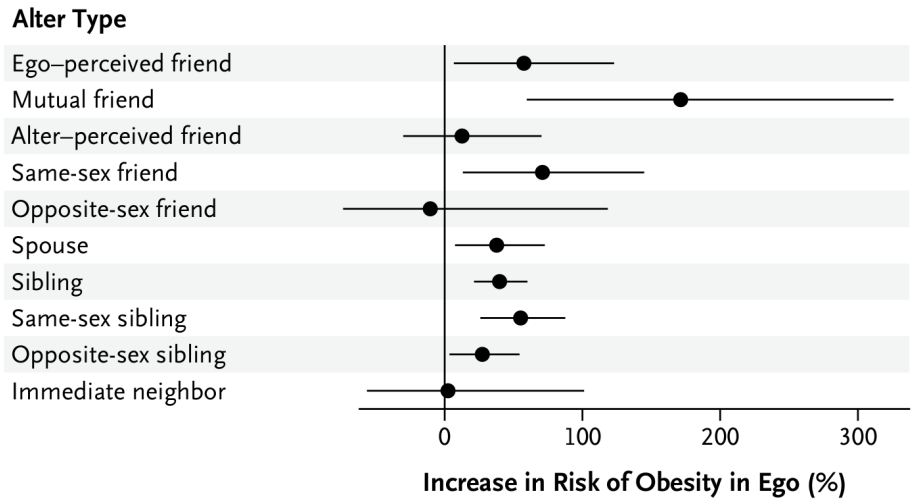
  - Can we predict a node's state from its friends' states?
    - ★ Control for confounding by checking if direction of relationships had an impact
    - ★ Control for selection by conditioning at the node's previous state

Both studies found significant evidence for influence!

Examples: Obesity & Divorce





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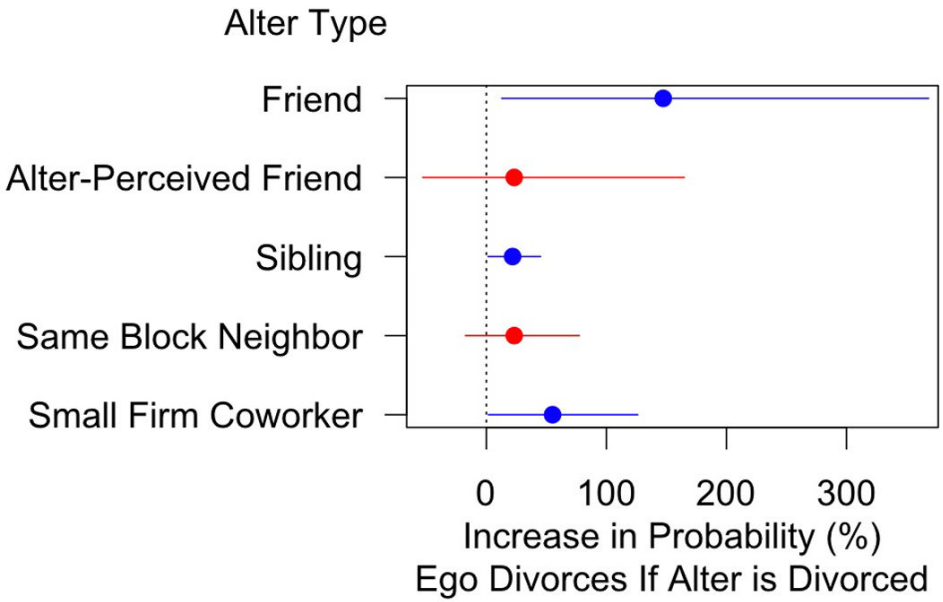

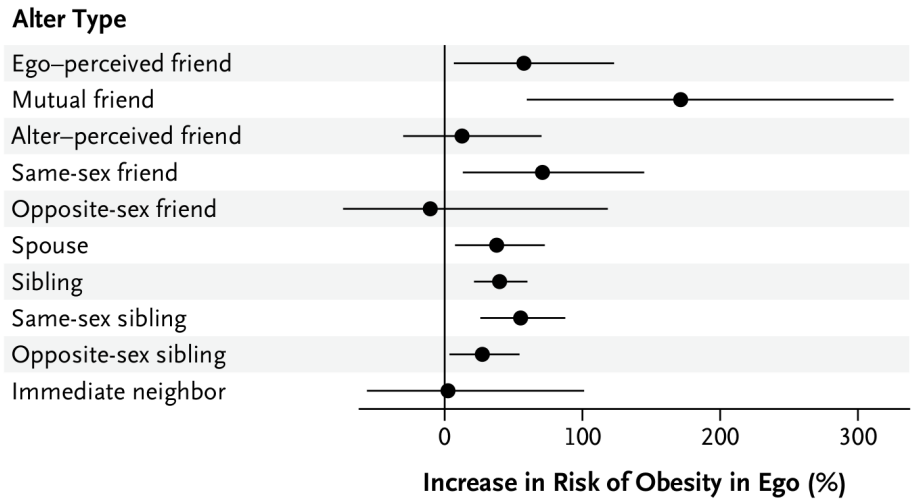

- Even conditioning on the past, the state of our neighbours matters!
  - If only the past mattered, the increase in probability would be 0% in the plots above.

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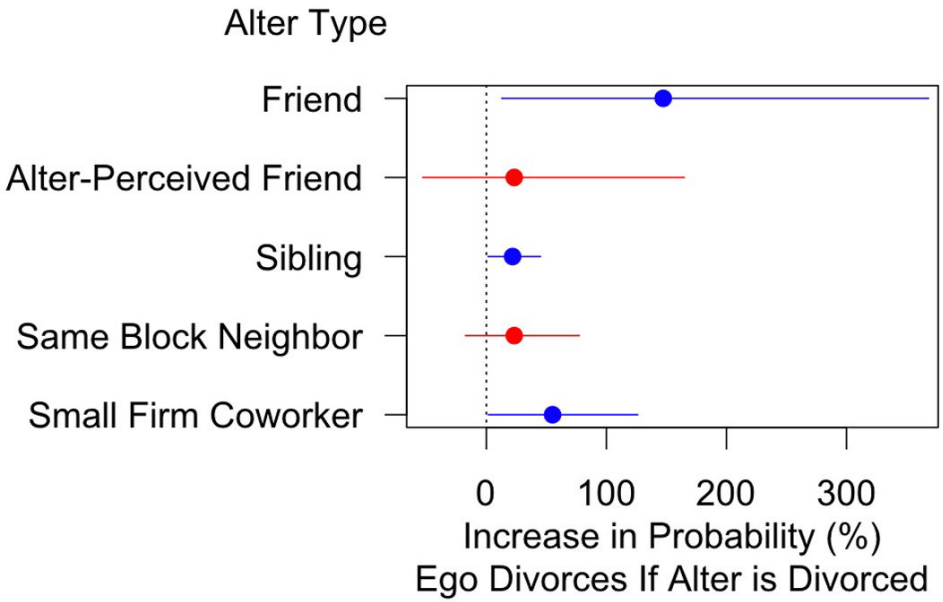
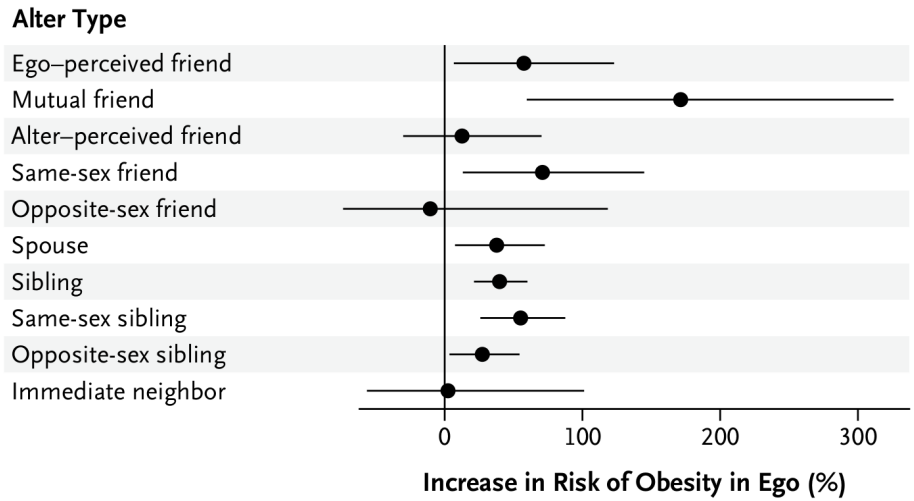
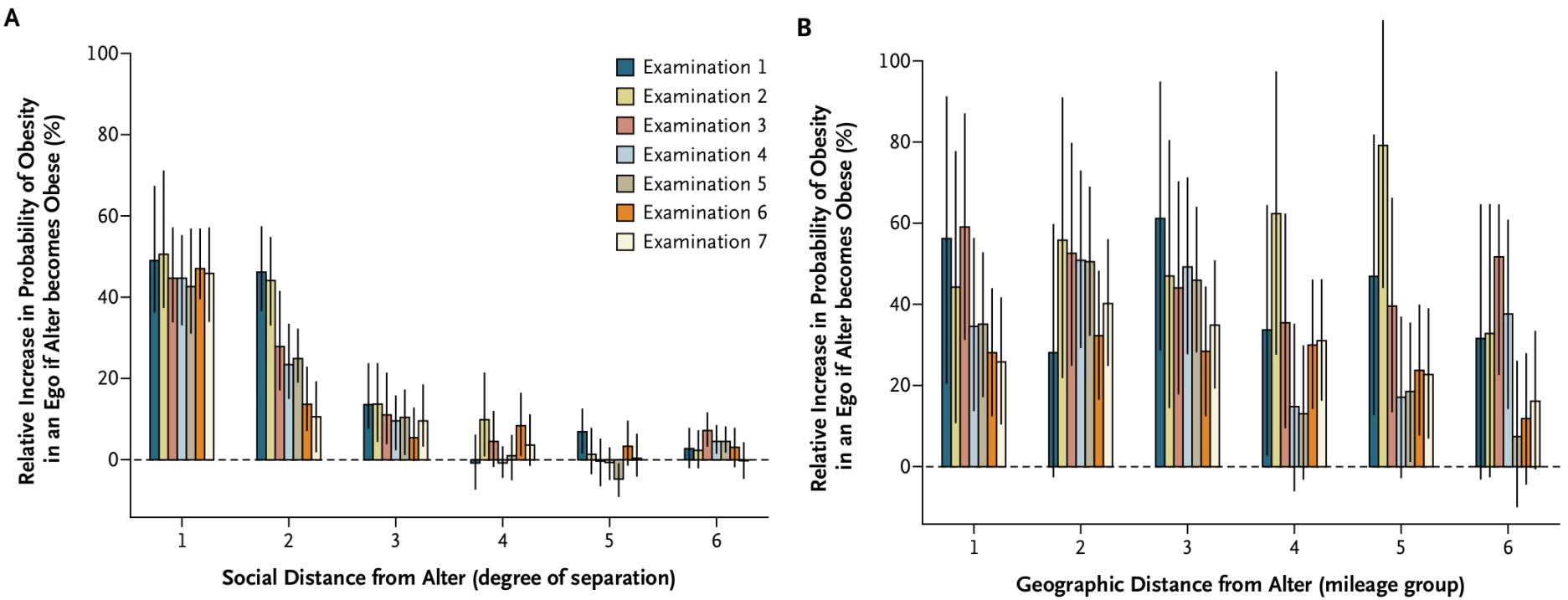




- Even conditioning on the past, the state of our neighbours matters!
  - If only the past mattered, the increase in probability would be 0% in the plots above.
- The size of the effect changes based on relationship type:
  - Stronger when they consider the neighbour a friend (i.e., "ego perceived friend")
  - Weaker when only the neighbour considers them a friend (i.e., "alter perceived friend")

Examples: Obesity & Divorce

- There is additional evidence for influence:
  - The authors also plotted the empirical conditional probability (adjusting against a random baseline; the details are beyond the scope of the course)
  - The conditional probability decays with social distance (length of the shortest path in the social network)
  - There is no trend, or a weaker trend, with geographic distance.



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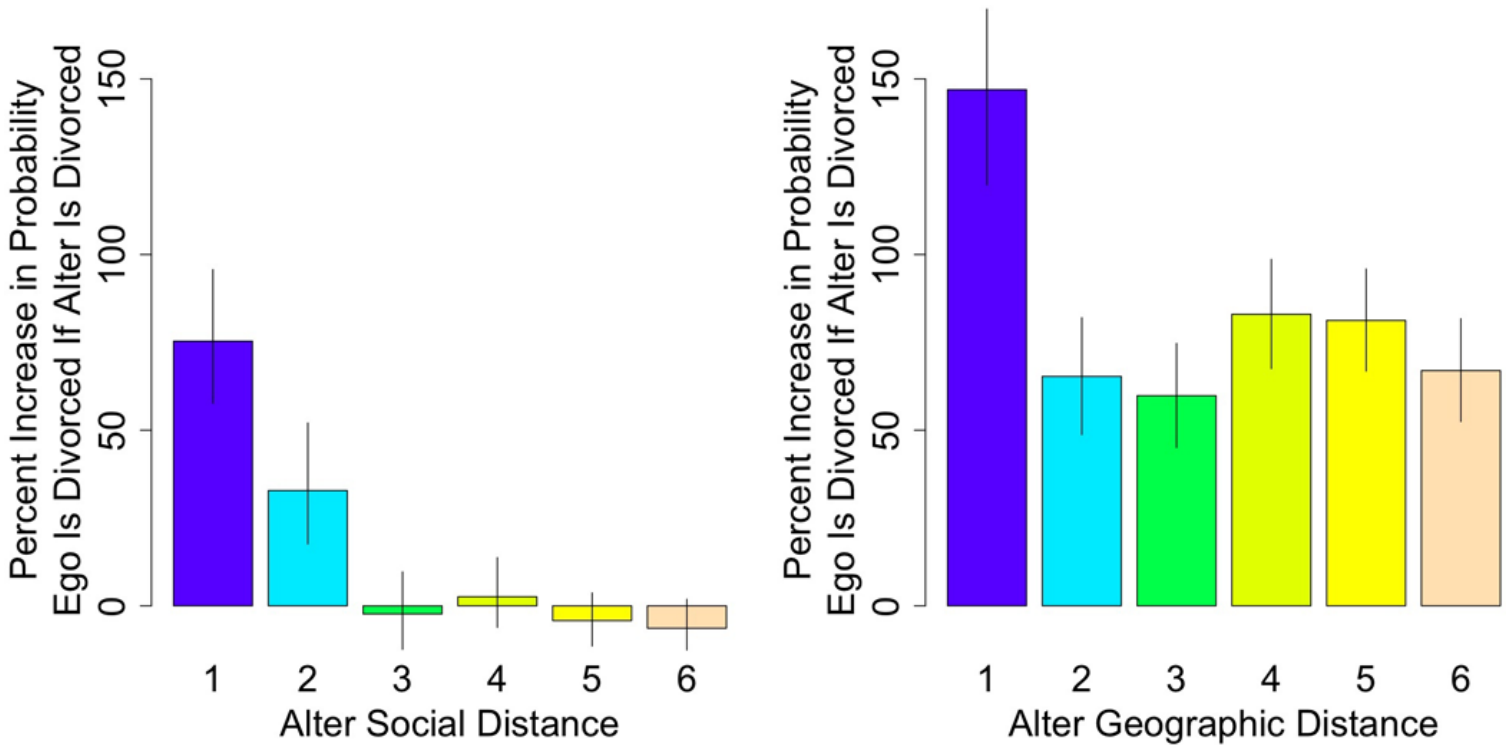

Quercus Quiz