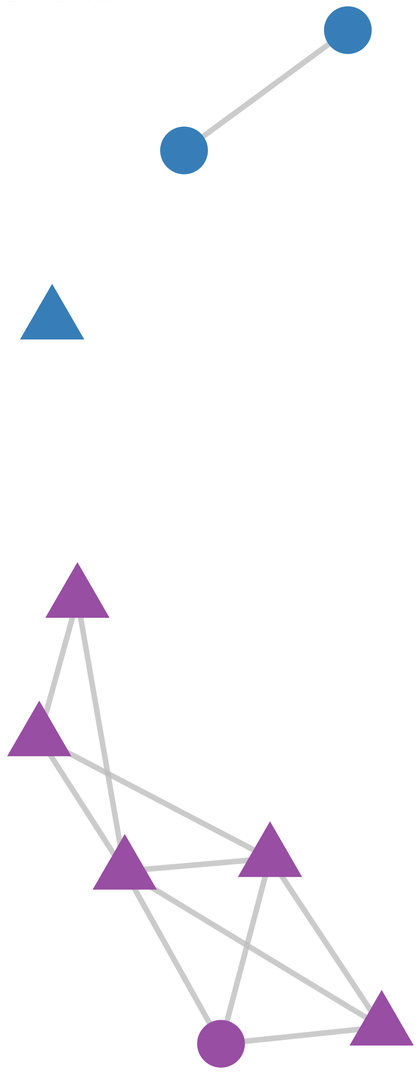
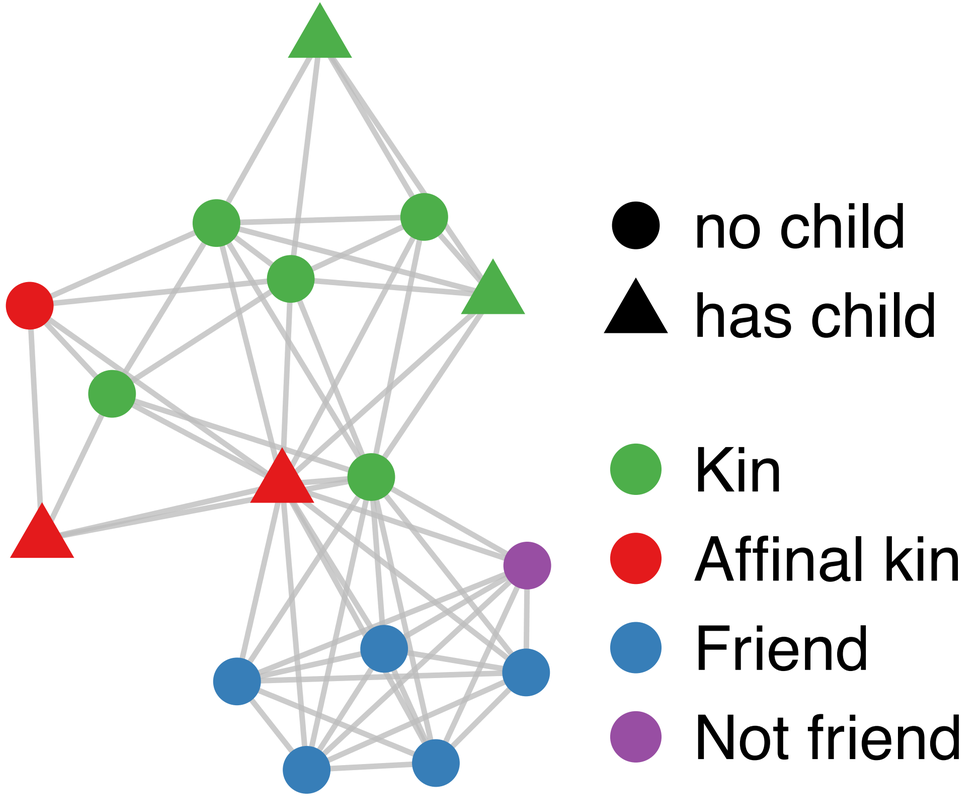
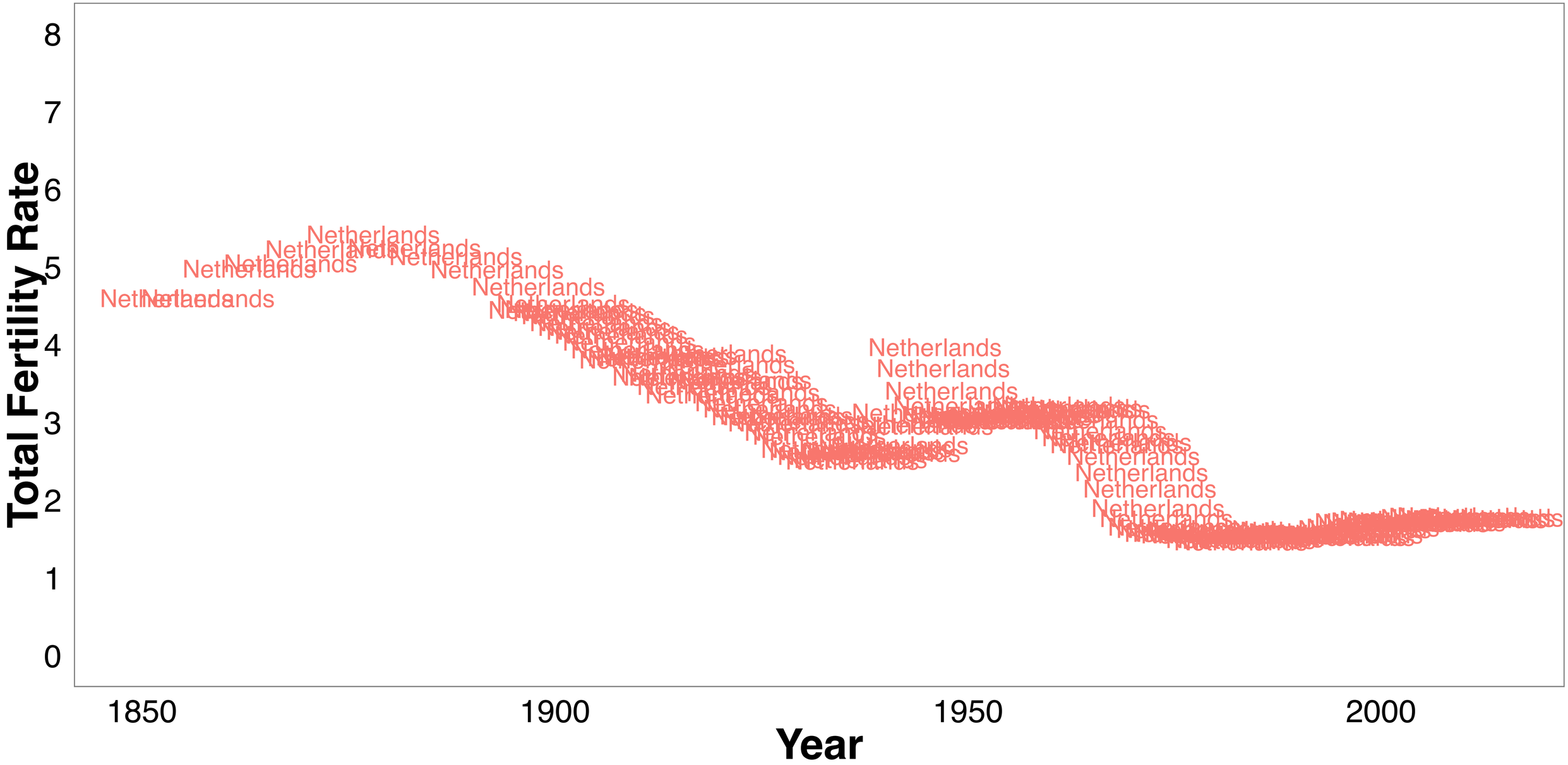
Collecting personal networks to study social influences on fertility behaviour





gert stulp
gertstulp.com


Total Fertility Rate
8
7
6
5
4
3
2
1
0
1850
1900
1950
2000
Year
Netherlands

> one kind of social interaction, informal conversations with networks of relatives, friends, and neighbours, was important for historical change in bedroom behavior

WATKINS 1995

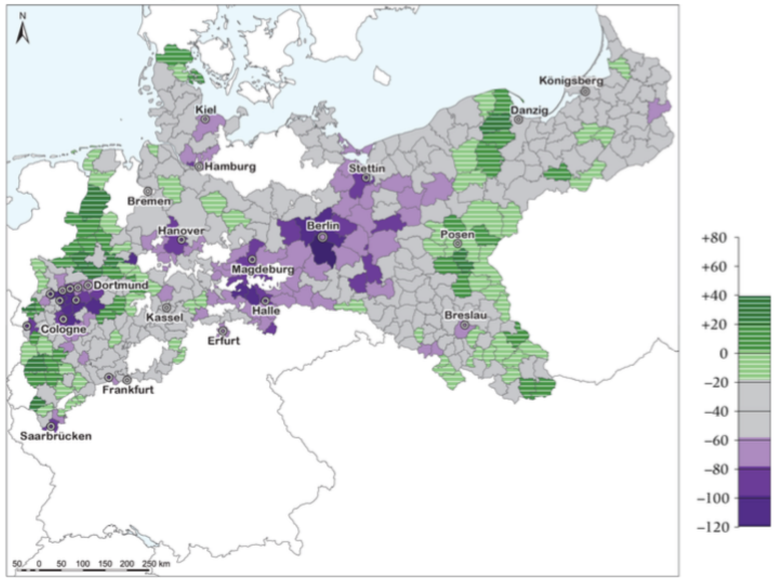
Social Influence & Fertility

historical evidence

Spatial Analysis of the Causes of Fertility Decline in Prussia

JOSHUA R. GOLDSTEIN
SEBASTIAN KLÜSENER

FIGURE 5a Observed change in the dependent variable (models 1–4): Absolute change in the general marital fertility rate between 1890 and 1910



convenience samples

Does Fertility Behavior Spread among Friends?

Nicoletta Balbo[a] and Nicola Barban[b]

American Sociological Review
2014, Vol. 79(3) 412–431
© American Sociological Association 2014
DOI: 10.1177/0003122414531596
http://asr.sagepub.com

qualitative studies

Channels of social influence on reproduction

LAURA BERNARDI
Max Planck Institute for Demographic Research

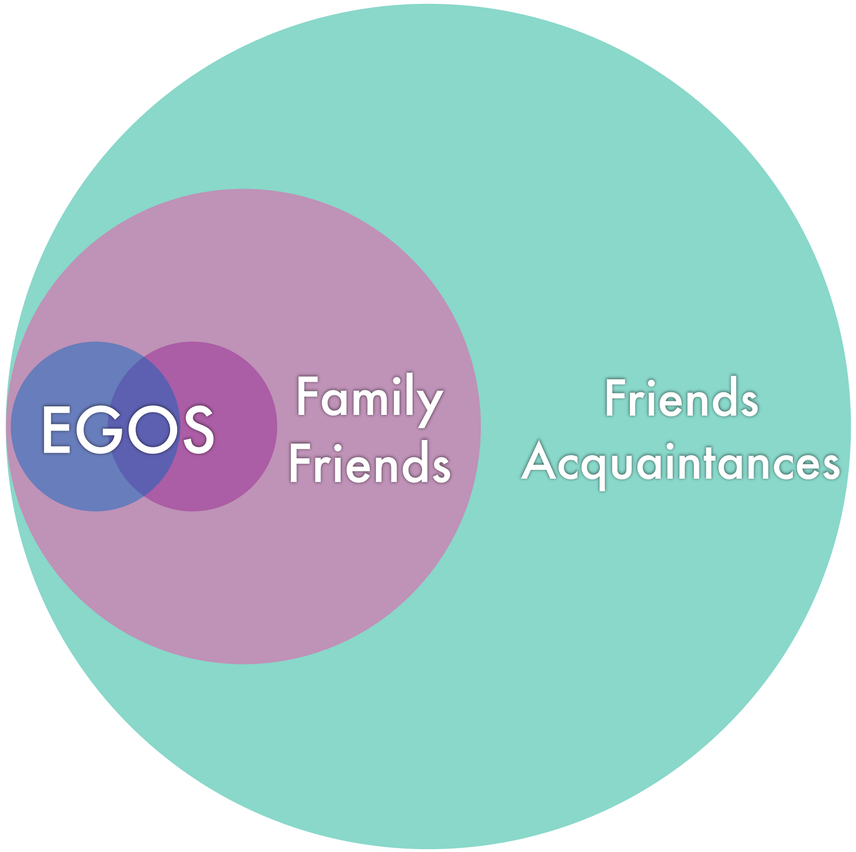
social learning
social contagion
social pressure
social support

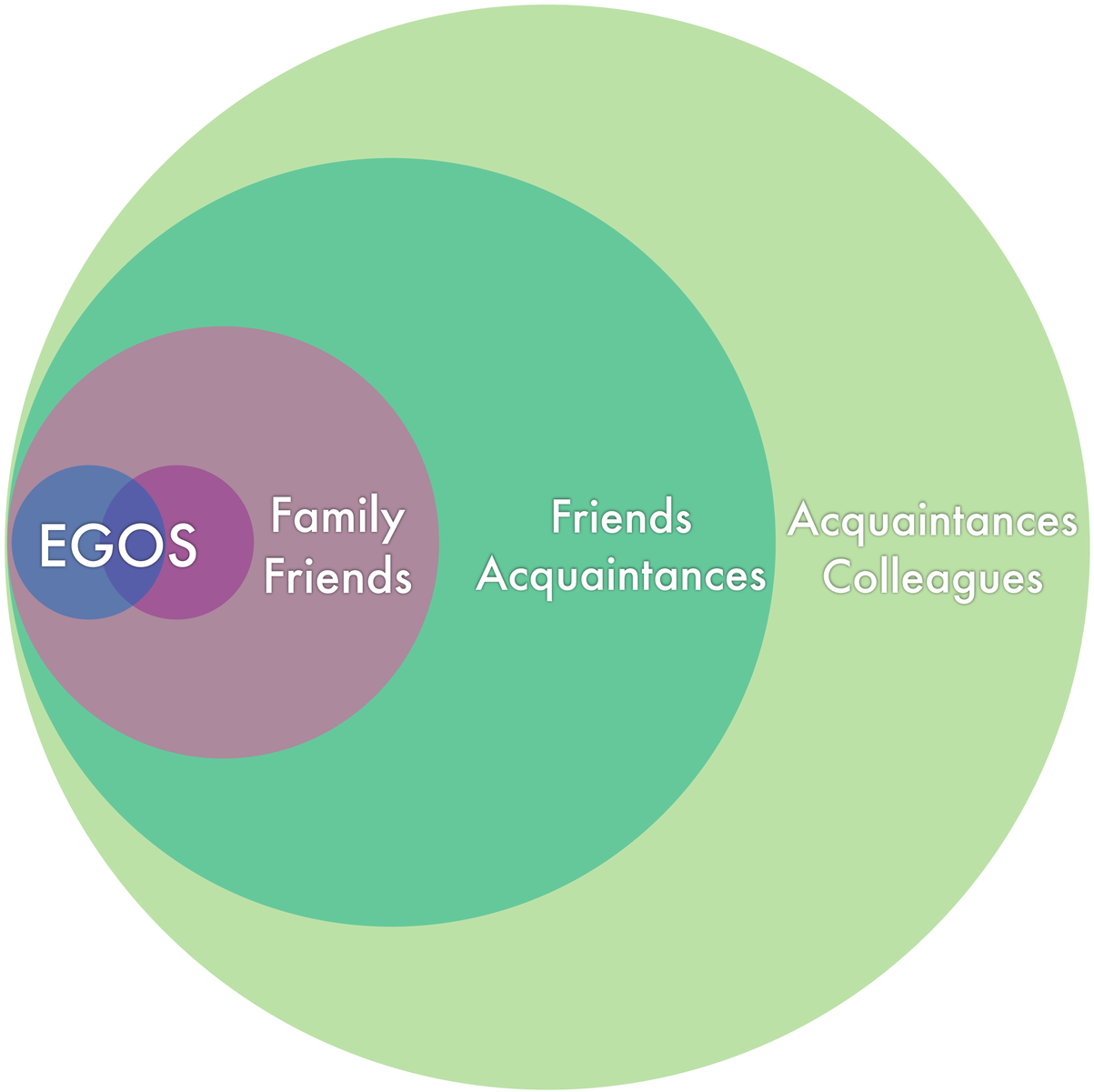
quantifying social influences on fertility behaviour using personal network data

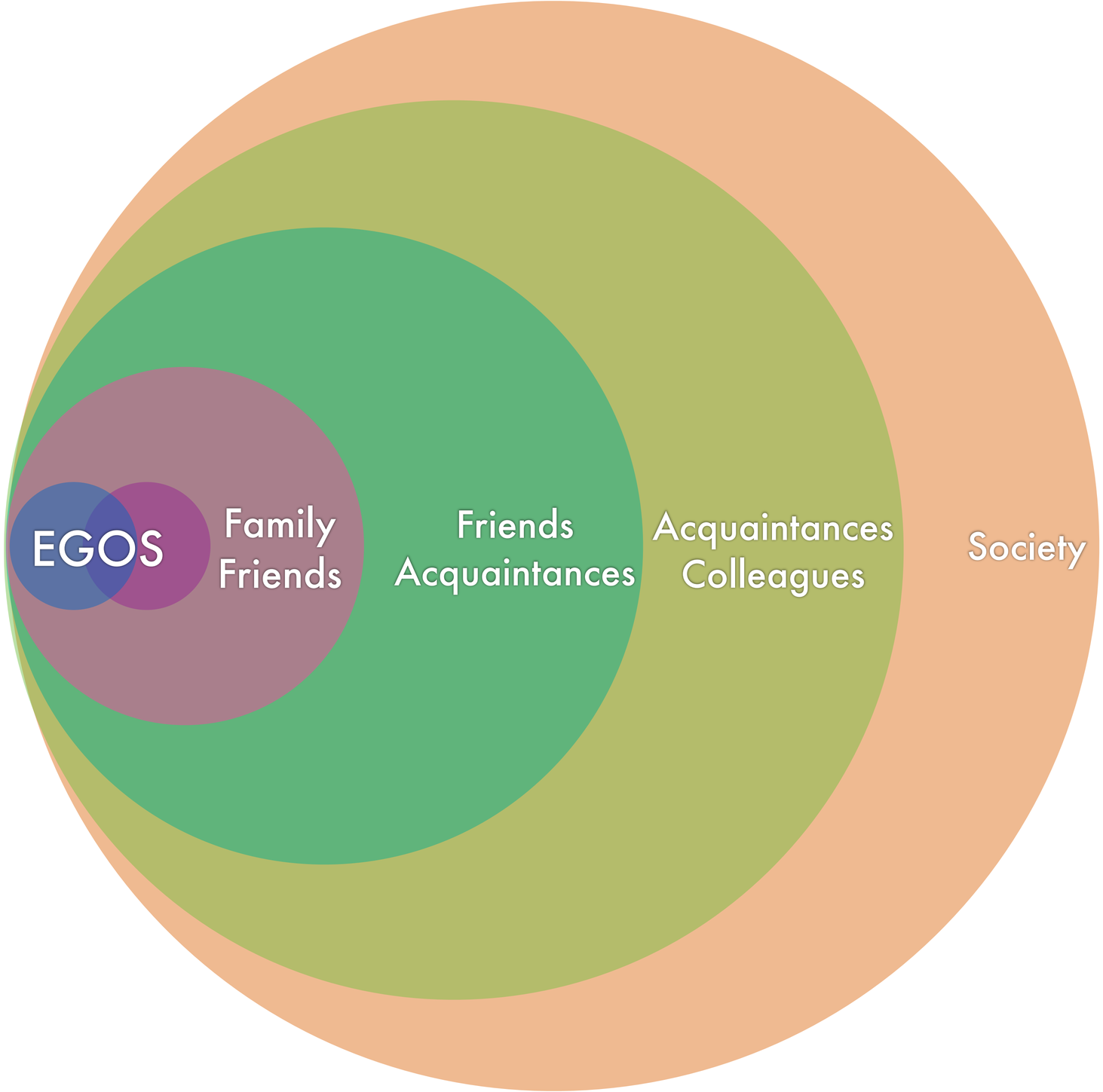
EGO

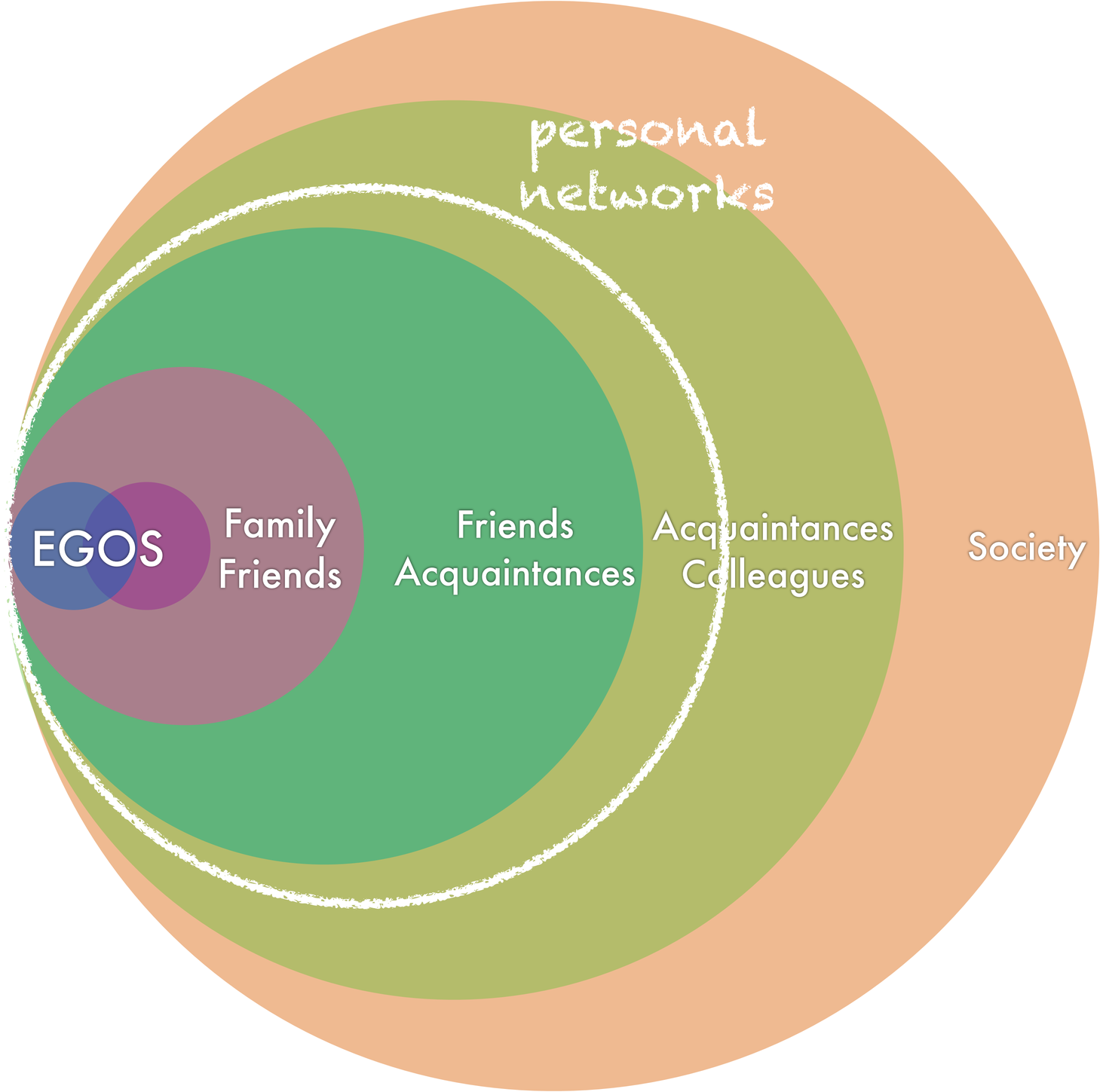
EGOS

EGOS
Family
Friends


EGOS
Family
Friends
Friends
Acquaintances

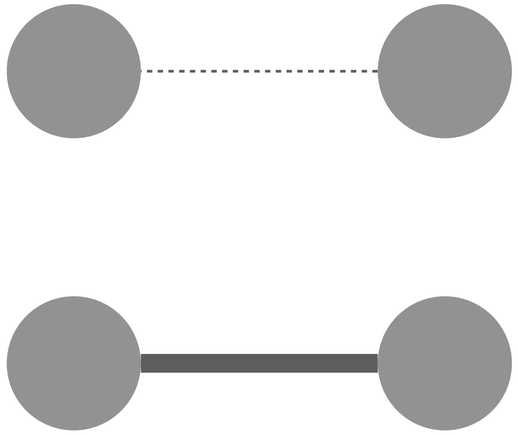

EGOS
Family
Friends
Friends
Acquaintances
Acquaintances
Colleagues


EGOS
Family
Friends
Friends
Acquaintances
Acquaintances
Colleagues
Society


personal networks
EGOS
Family
Friends
Friends
Acquaintances
Acquaintances
Colleagues
Society

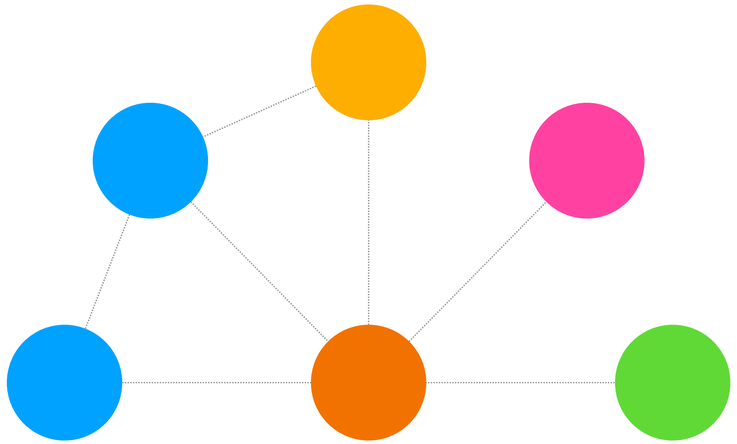
Personal Networks

tie (strength)



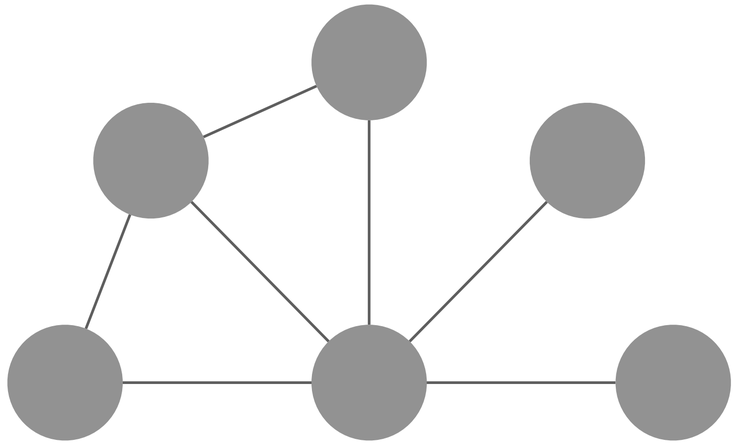
strong tie, more support/pressure
e.g., quality of relation with parent

composition



support network, diversity in ideas
e.g., # kin, # friends, # can help

structure



reinforcing norms, flow information
e.g., density, # cliques

PART I

PART II

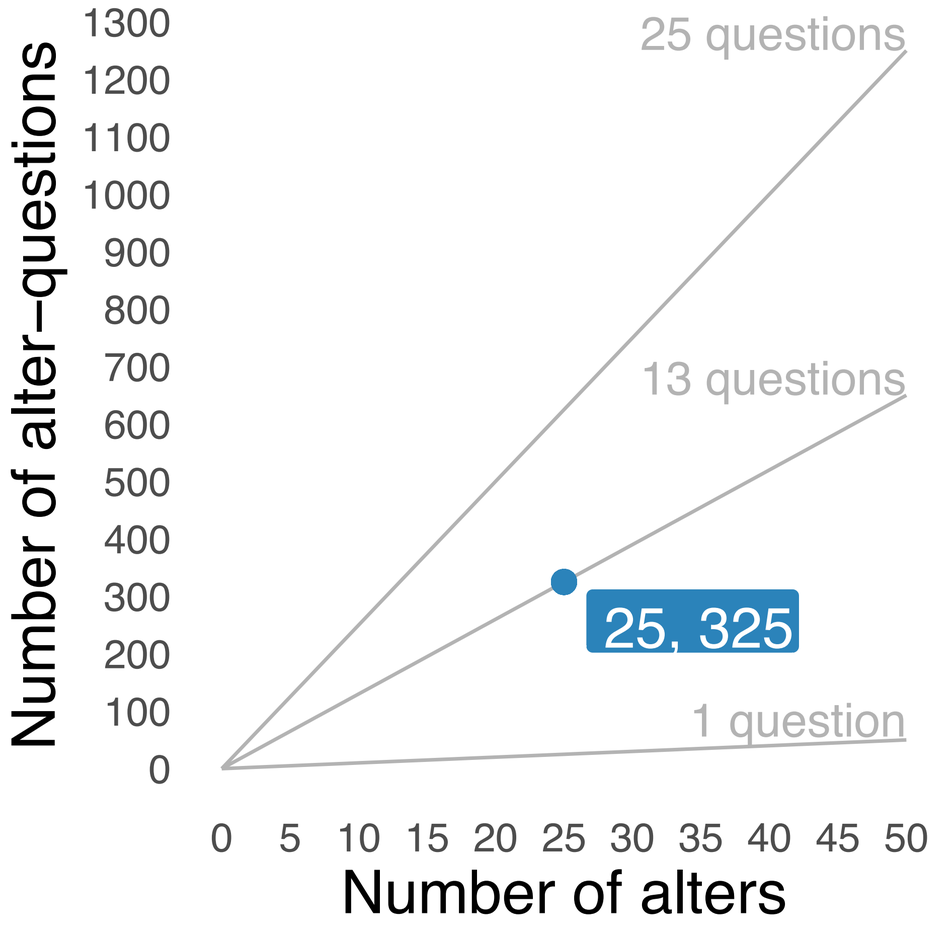
Bigger Is Better (?)

weak ties

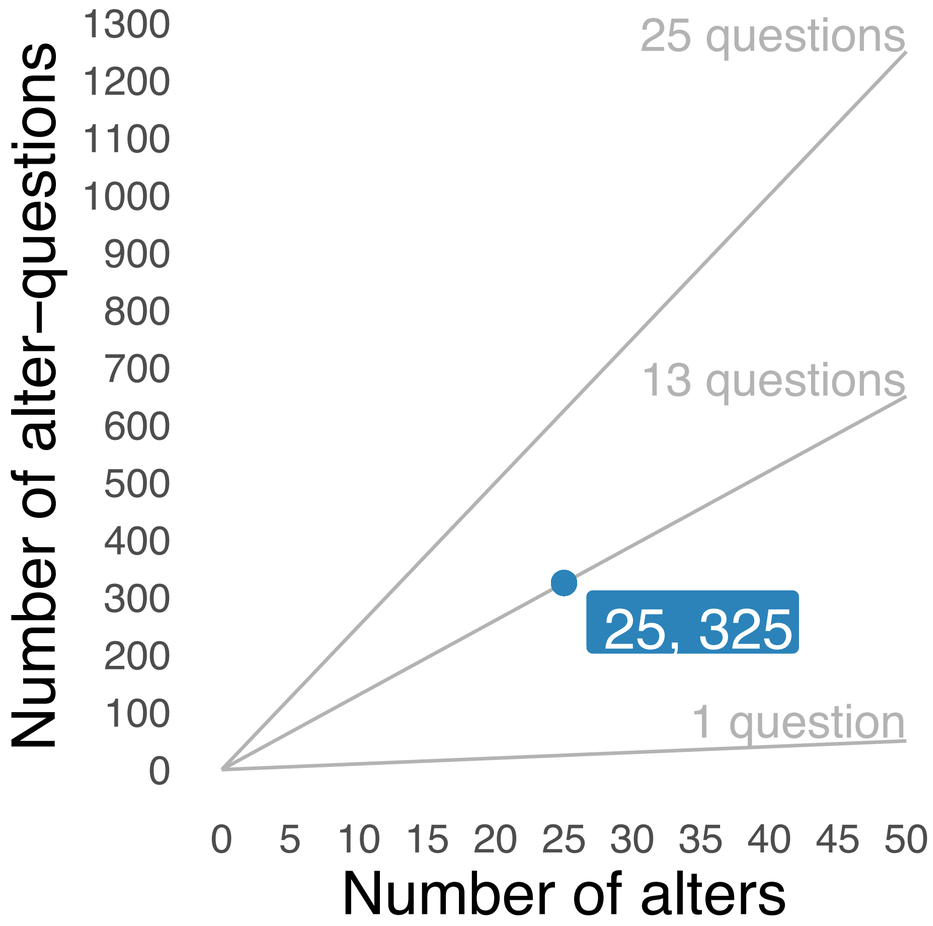
structure characteristics

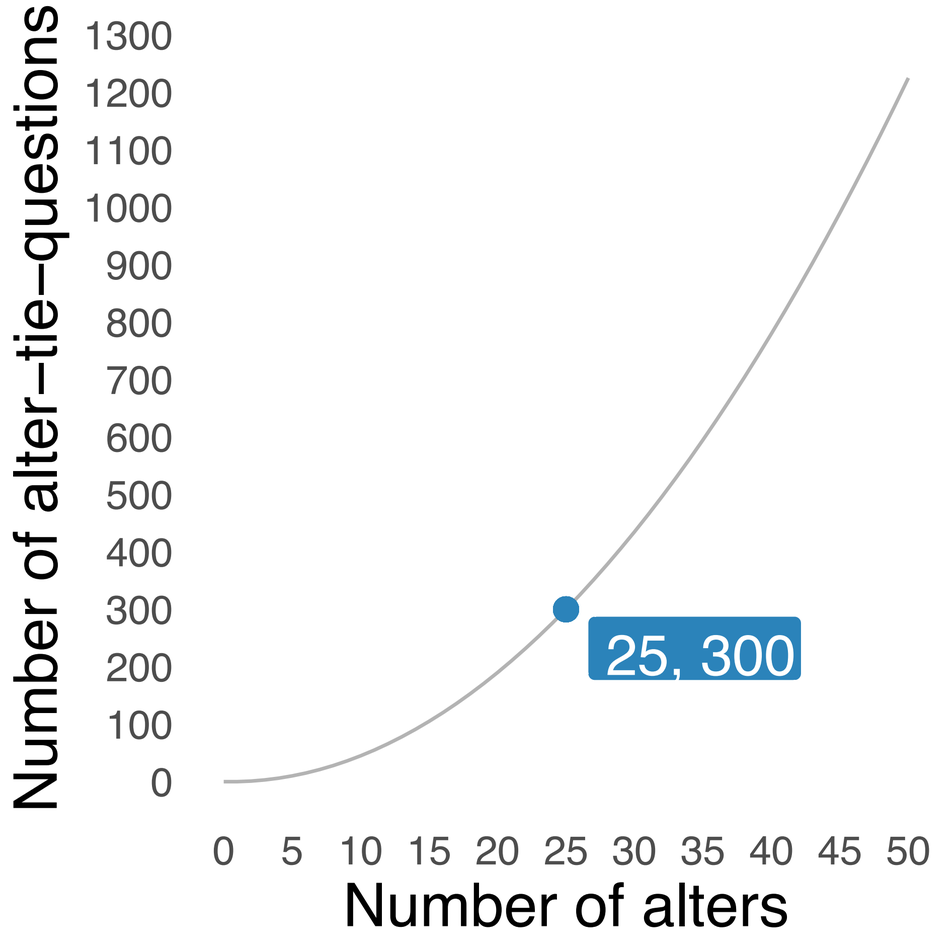
Data Collection Worries

Data Collection Worries



Data Collection Worries





Data Collection Worries

ELSEVIER

Social Networks

Volume 32, Issue 2, May 2010, Pages 105-111

Does the online collection of ego-centered network data reduce data quality? An experimental comparison

Uwe Matzat, Chris Snijders

YES

GENSI

Graphical Ego-centered Network Survey Interface

Social Networks 48 (2017) 36–45

Contents lists available at ScienceDirect

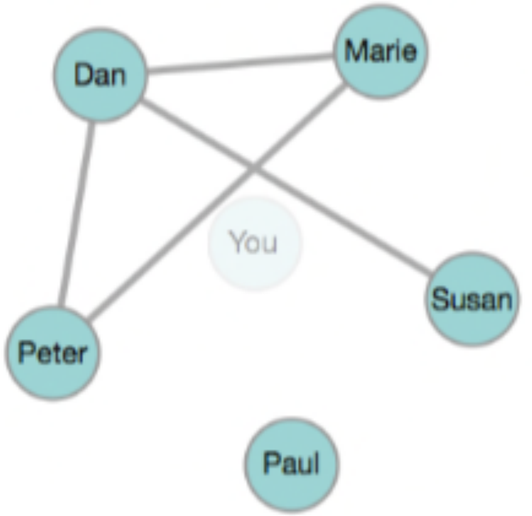
Social Networks

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

GENSI: A new graphical tool to collect ego-centered network data

Tobias H. Stark[a,*], Jon A. Krosnick[b]

[a] Utrecht University/ICS, Padualaan 14, 3584 CH Utrecht, The Netherlands
[b] Stanford University, 450 Serra Mall, Stanford, CA 94305, United States



GENSI

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compard to standard survey-methods,

people who used GENSI:

- enjoyed the survey more
- thought the survey was more interesting
- said they were more willing to participate in a future survey

GENSI

Graphical Ego-centered Network Survey Interface

Social Networks 48 (2017) 36–45

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"A practical limitation for future research with GENSI is that the tool is only suitable for small ego-centered networks. When the number of alters exceeds seven or eight, it gets visually challenging to see all circles in a network."

Collecting
large personal networks
in a
representative sample
of Dutch women, using
GENSI

Disclaimer

LARGE NETWORKS

25

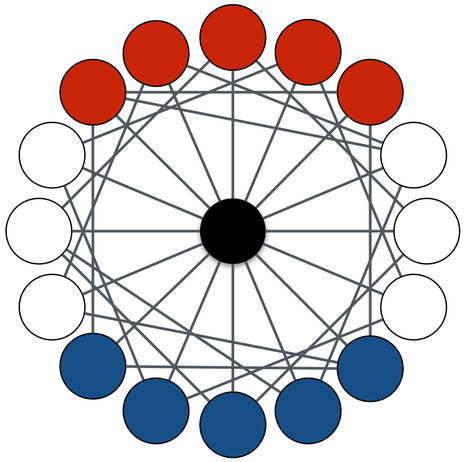
LARGE SAMPLES

700

Methodology

Longitudinal Internet Studies for the Social sciences

True probability sample of households drawn from the population register.
Respondents participate in monthly Internet surveys.
Extensive background information available on respondent
High retention rates (e.g., 70 %)



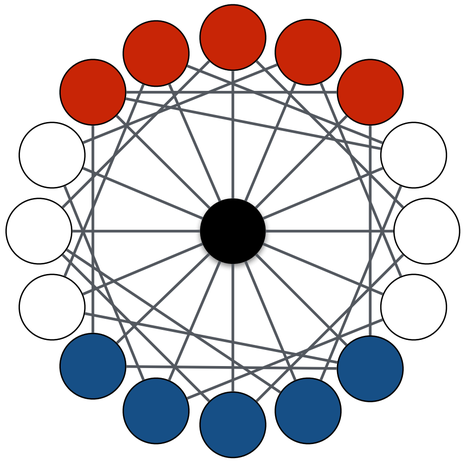
All women between 18 - 40 asked (N = 1322)
N = 758 responded (57%); age: 29 (± 6)
Incentive: 12.50 euro
Period of 1 month (~ march)

Methodology

Ego

Detailed fertility intentions

Alters (25)



Sex
Age
Education
Relationship type
Closeness
Frequency of contact F2F
Frequency of other contact

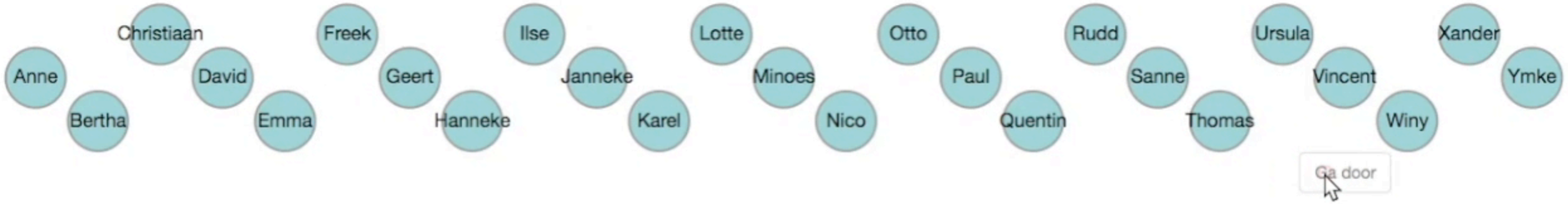
Number and age of children
Friend
Wants children
Does not want children
Help with children
Talk about children
Relationship with other alters

GENSI: Name Generator

Please list 25 names of individuals 18 years or older with whom you have had contact in the last year. This can be face-to-face contact, but also contact via phone, internet, or email. You know these people and these people also know you from your name or face (think of friends, family, acquaintances, et cetera). You could reach out to these people if you would have to. Please name your partner in case you have one.

GENSI: Alter Characteristics

Which of these 25 individuals could you ask for help with care for a child?



GENSI: 5 response options

How close are you to these people?

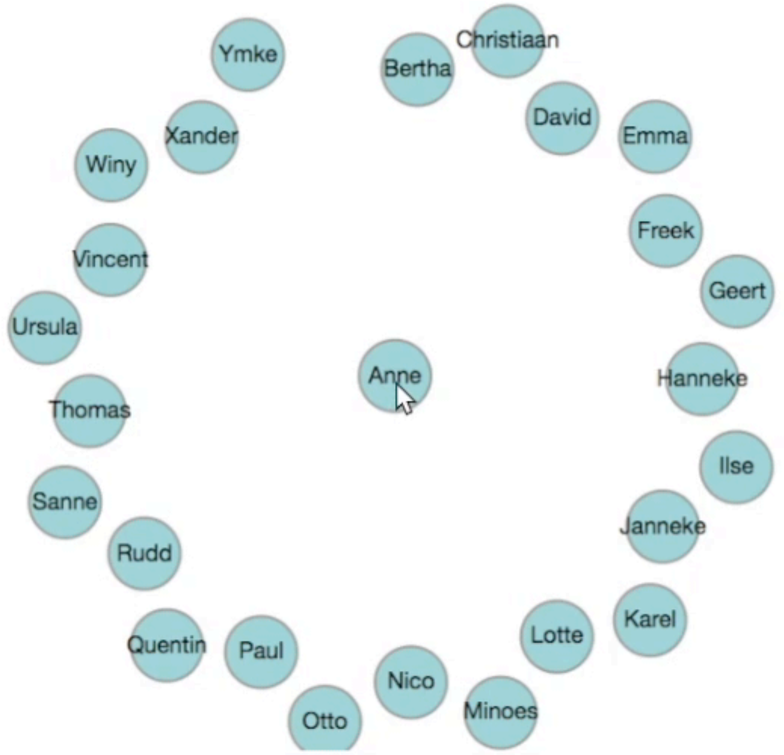
GENSI: Alter-Alter-ties

powered by Screencastify l

Als het gaat om ANNE

Met wie heeft ANNE contact? Met contact bedoelen we alle vormen van contact, zoals face-to-face contact, contact via (mobiele) telefoon, post, email, sms, en andere manieren van online en offline communicatie.

Selecteer de personen die contact met elkaar hebben door met de muis op het bolletje te klikken. Er zal een lijn ontstaan die aangeeft dat de personen contact met elkaar hebben. Druk nogmaals op het bolletje om de lijn weer te laten verdwijnen, als de personen geen contact met elkaar hebben.



Ga door

Conclusion

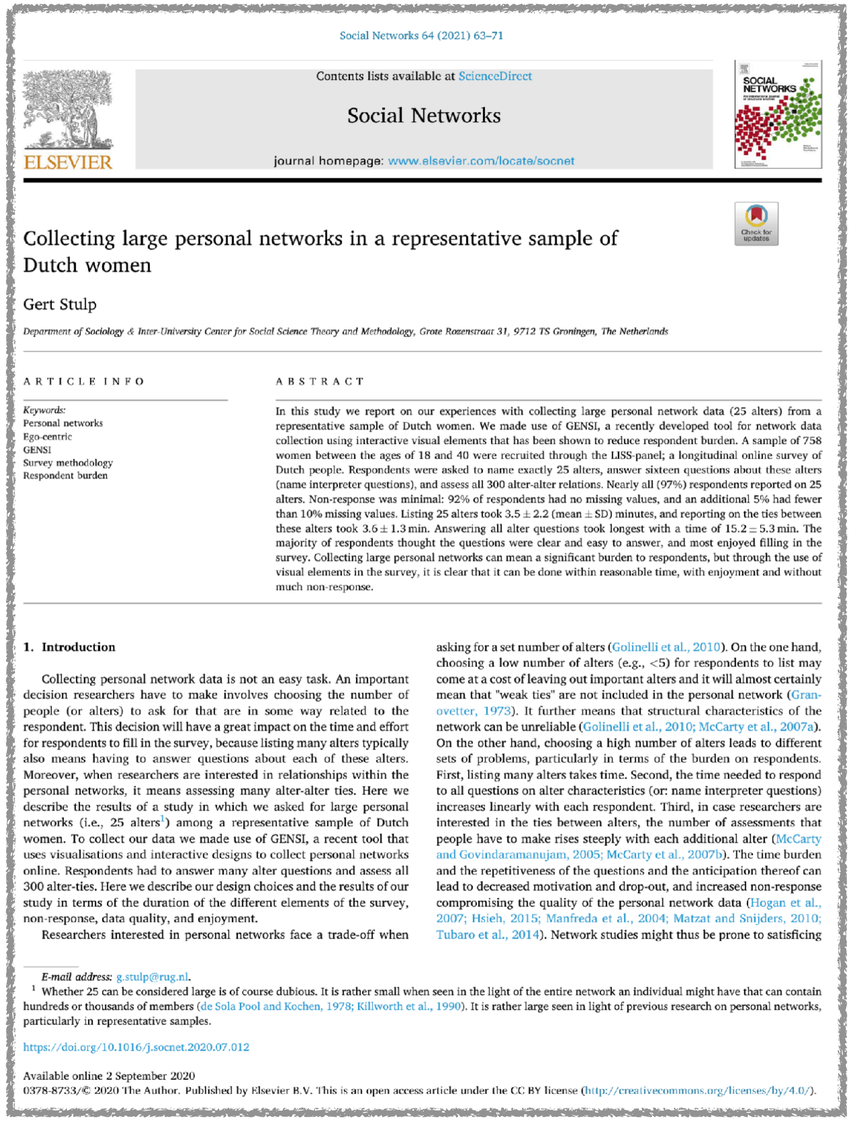
Collecting large personal networks feasible

- Not too time-consuming
- Little missing data
- Data quality?

GENSI useful for large(r) networks

- Improved user experience?

Valuable data



Social Networks 64 (2021) 63–71

Contents lists available at ScienceDirect

Social Networks

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

Collecting large personal networks in a representative sample of Dutch women

Gert Stulp

Department of Sociology & Inter-University Center for Social Science Theory and Methodology, Grote Rozenstraat 31, 9712 TS Groningen, The Netherlands

ARTICLE INFO

Keywords:
Personal networks
Ego-centric
GENSI
Survey methodology
Respondent burden

ABSTRACT

In this study we report on our experiences with collecting large personal network data (25 alters) from a representative sample of Dutch women. We made use of GENSI, a recently developed tool for network data collection using interactive visual elements that has been shown to reduce respondent burden. A sample of 758 women between the ages of 18 and 40 were recruited through the LISS-panel; a longitudinal online survey of Dutch people. Respondents were asked to name exactly 25 alters, answer sixteen questions about these alters (name interpreter questions), and assess all 300 alter-alter relations. Nearly all (97%) respondents reported on 25 alters. Non-response was minimal: 92% of respondents had no missing values, and an additional 5% had fewer than 10% missing values. Listing 25 alters took 3.5 ± 2.2 (mean ± SD) minutes, and reporting on the ties between these alters took 3.6 ± 1.3 min. Answering all alter questions took longest with a time of 15.2 = 5.3 min. The majority of respondents thought the questions were clear and easy to answer, and most enjoyed filling in the survey. Collecting large personal networks can mean a significant burden to respondents, but through the use of visual elements in the survey, it is clear that it can be done within reasonable time, with enjoyment and without much non-response.

1. Introduction

Collecting personal network data is not an easy task. An important decision researchers have to make involves choosing the number of people (or alters) to ask for that are in some way related to the respondent. This decision will have a great impact on the time and effort for respondents to fill in the survey, because listing many alters typically also means having to answer questions about each of these alters. Moreover, when researchers are interested in relationships within the personal networks, it means assessing many alter-alter ties. Here we describe the results of a study in which we asked for large personal networks (i.e., 25 alters[1]) among a representative sample of Dutch women. To collect our data we made use of GENSI, a recent tool that uses visualisations and interactive designs to collect personal networks online. Respondents had to answer many alter questions and assess all 300 alter-ties. Here we describe our design choices and the results of our study in terms of the duration of the different elements of the survey, non-response, data quality, and enjoyment.

Researchers interested in personal networks face a trade-off when asking for a set number of alters (Golinelli et al., 2010). On the one hand, choosing a low number of alters (e.g., <5) for respondents to list may come at a cost of leaving out important alters and it will almost certainly mean that "weak ties" are not included in the personal network (Granovetter, 1973). It further means that structural characteristics of the network can be unreliable (Golinelli et al., 2010; McCarty et al., 2007a). On the other hand, choosing a high number of alters leads to different sets of problems, particularly in terms of the burden on respondents. First, listing many alters takes time. Second, the time needed to respond to all questions on alter characteristics (or: name interpreter questions) increases linearly with each respondent. Third, in case researchers are interested in the ties between alters, the number of assessments that people have to make rises steeply with each additional alter (McCarty and Govindaramanujam, 2005; McCarty et al., 2007b). The time burden and the repetitiveness of the questions and the anticipation thereof can lead to decreased motivation and drop-out, and increased non-response compromising the quality of the personal network data (Hogan et al., 2007; Hsieh, 2015; Manfreda et al., 2004; Matzat and Snijders, 2010; Tubaro et al., 2014). Network studies might thus be prone to satisficing

E-mail address: g.stulp@rug.nl.

[1] Whether 25 can be considered large is of course dubious. It is rather small when seen in the light of the entire network an individual might have that can contain hundreds or thousands of members (de Sola Pool and Kochen, 1978; Killworth et al., 1990). It is rather large seen in light of previous research on personal networks, particularly in representative samples.

https://doi.org/10.1016/j.socnet.2020.07.012

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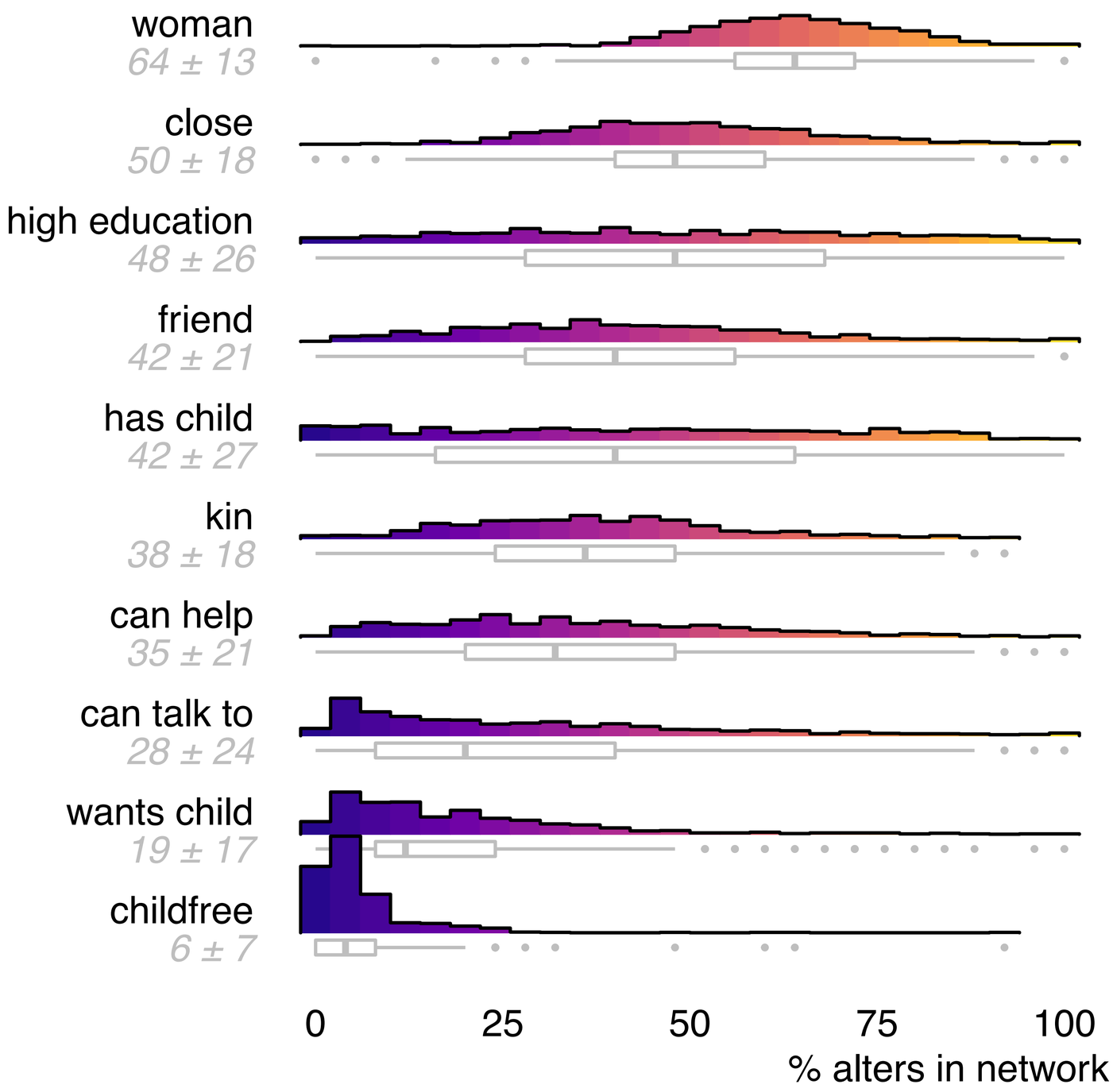
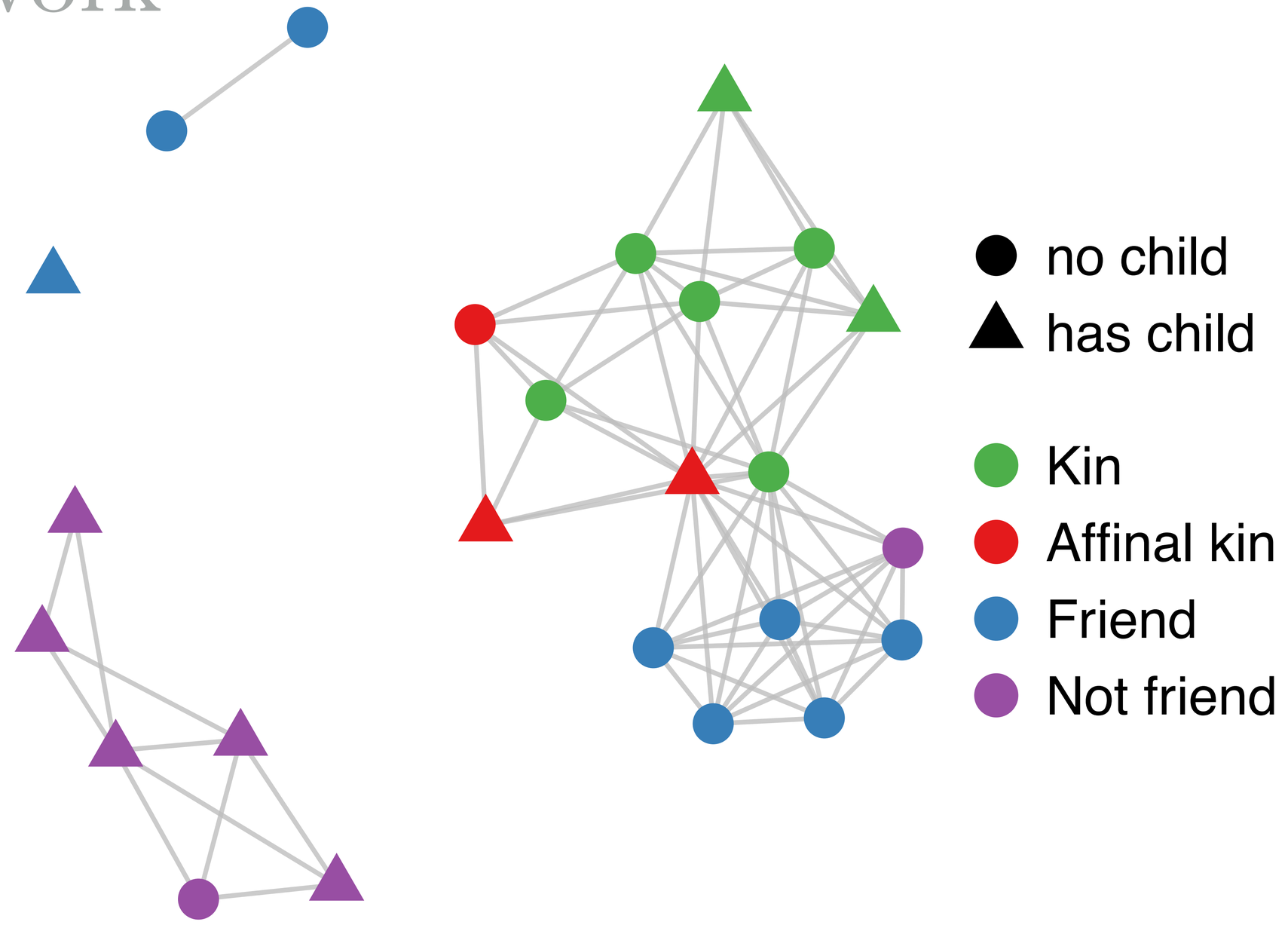
Descriptives



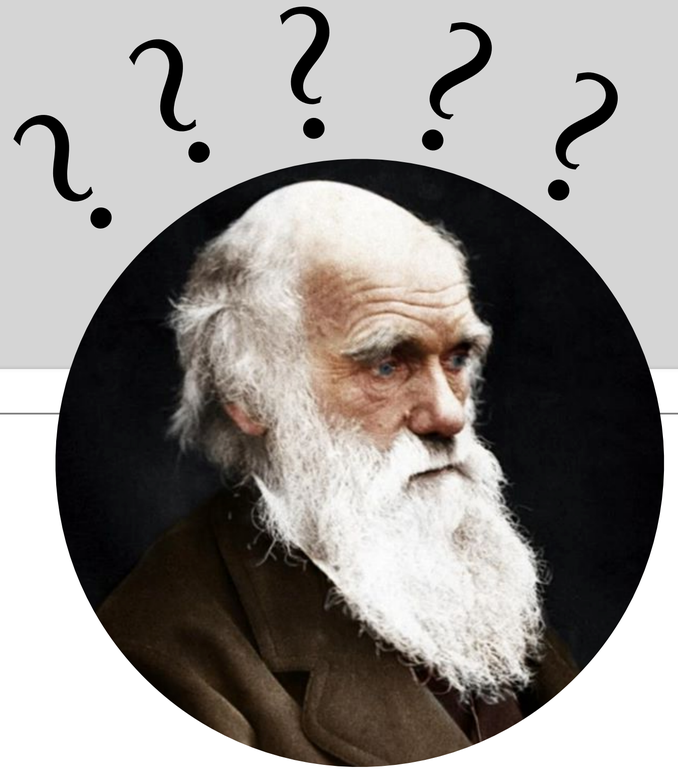
A typical network

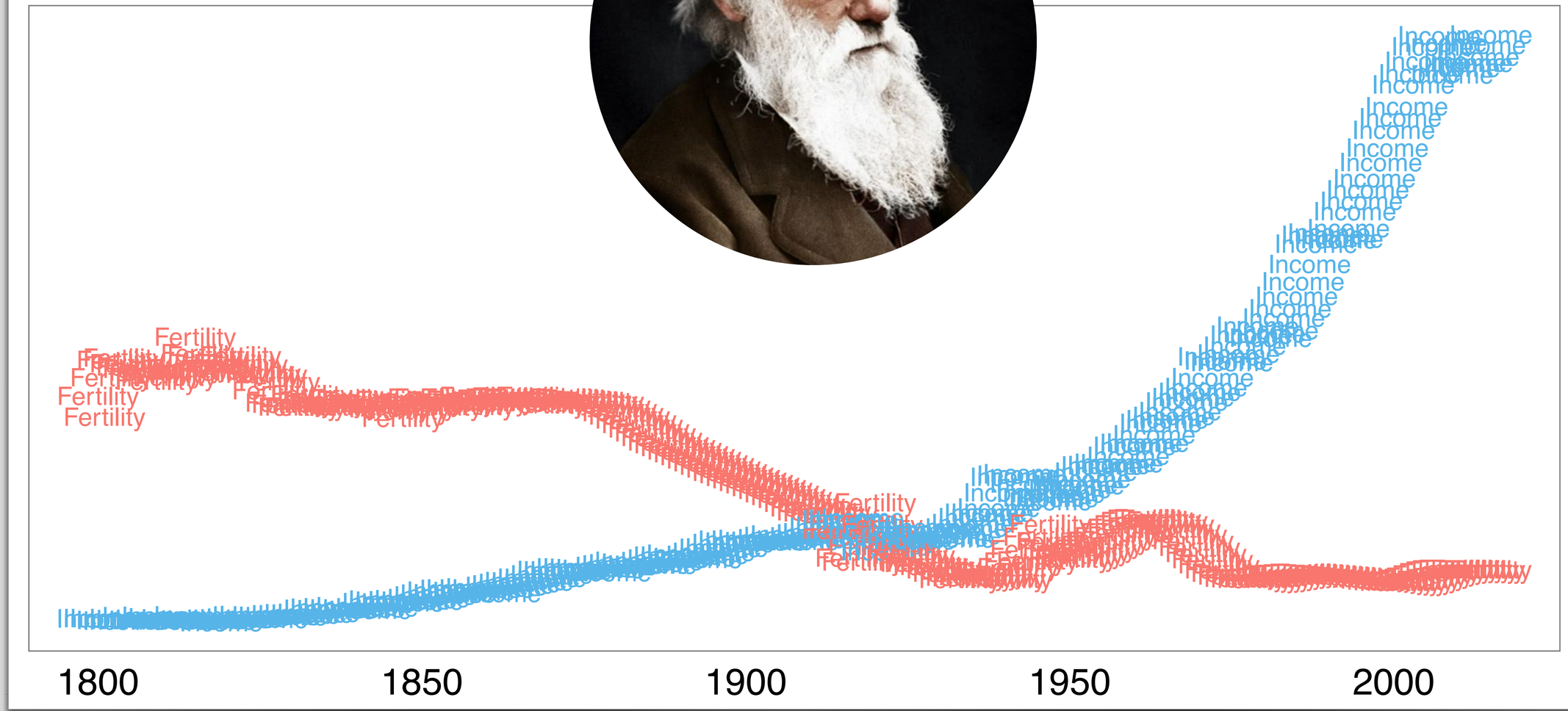


PART I

PART II

Louise Barrett




Fertility
Income
1800
1850
1900
1950
2000

Plenty of Evolutionary Ideas

Pro-natal Kin

kin might give …

support

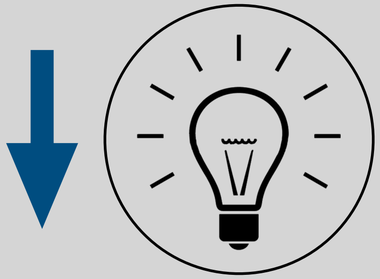
advice

pressure

The Idea

increasing modernisation,
means fewer kin around,
less support available,
fewer pro-natal sentiments,
anti-natal norms more likely

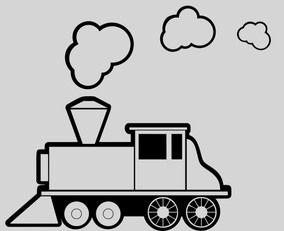
support



advice

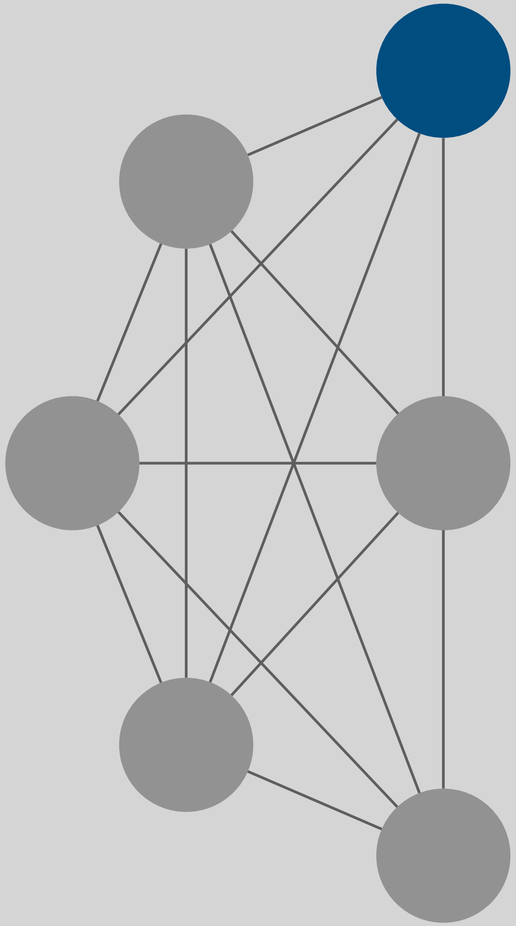
pressure

fertility
kin in network

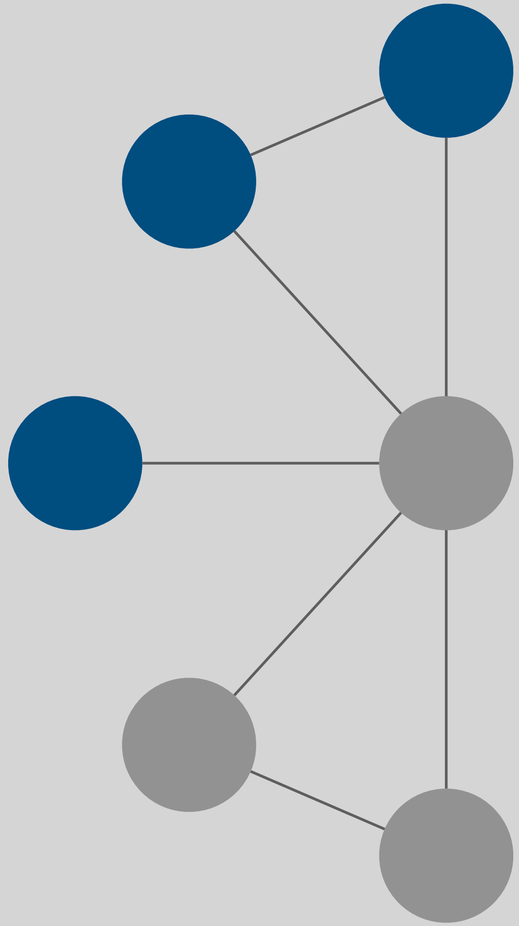


Modernisation & Kin-networks

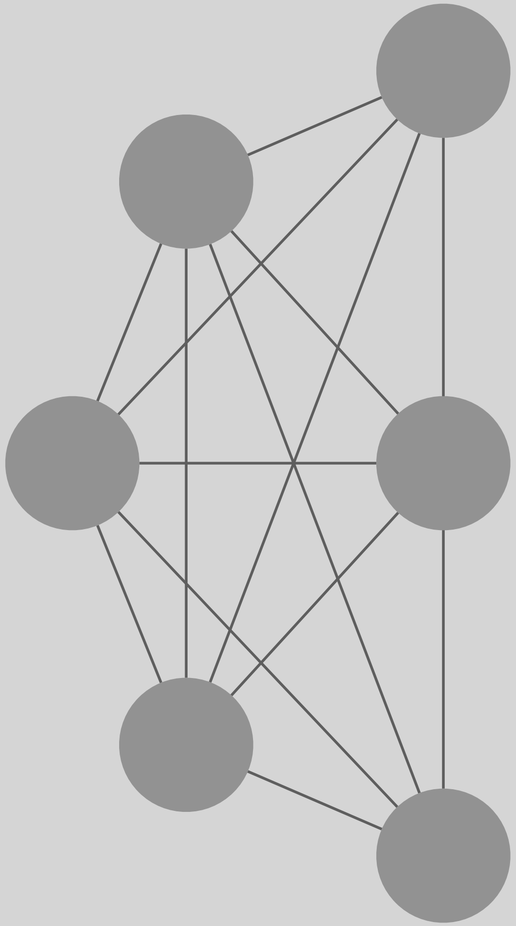
kin-rich, dense networks



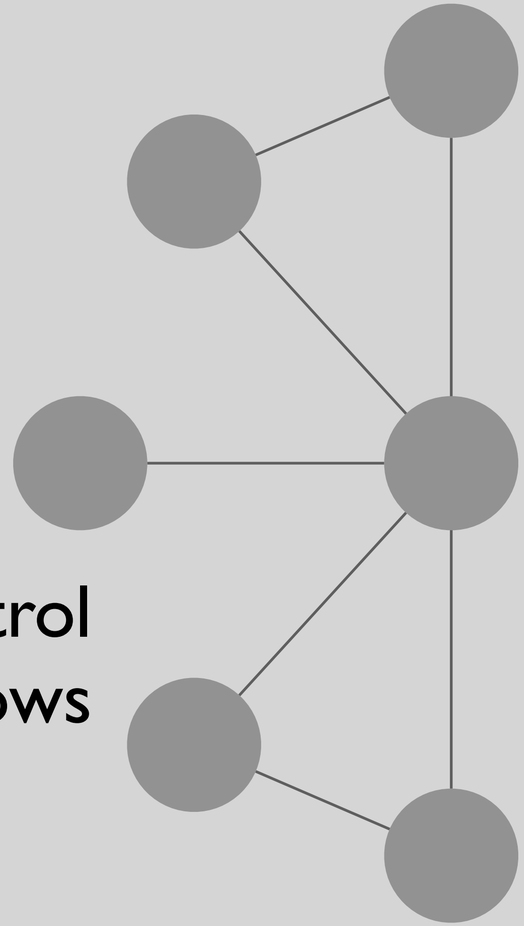
sparse networks, low on kin



Why Would Density Matter?



close monitoring
exert control
resist outside influence



less control
novel information flows

Aims

do kin-rich, dense networks provide more …

support

advice

pressure

Methods

Representative sample
706 Dutch women
ages 18 - 41
25 alters
kin/non-kin

Which of these 25 individuals could you ask for help with care for a child?

With whom of these 25 individuals do you discuss having children?

[My parents/caretakers] [Most of my friends] think I should have (more) children

Study Design: Summary

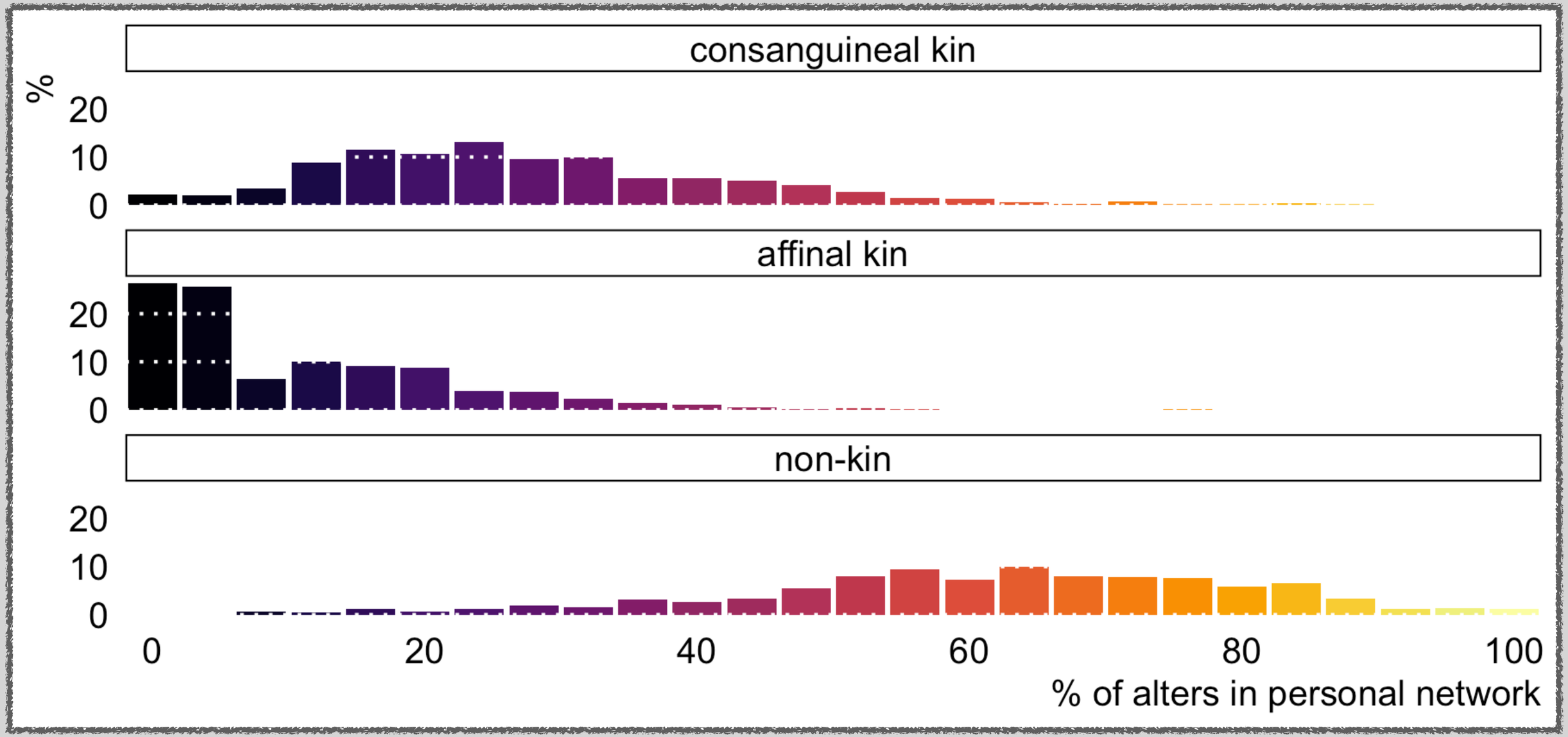
respondents
706 Dutch women

17,650 alters
consanguineal kin
affinal kin
friend
not a friend

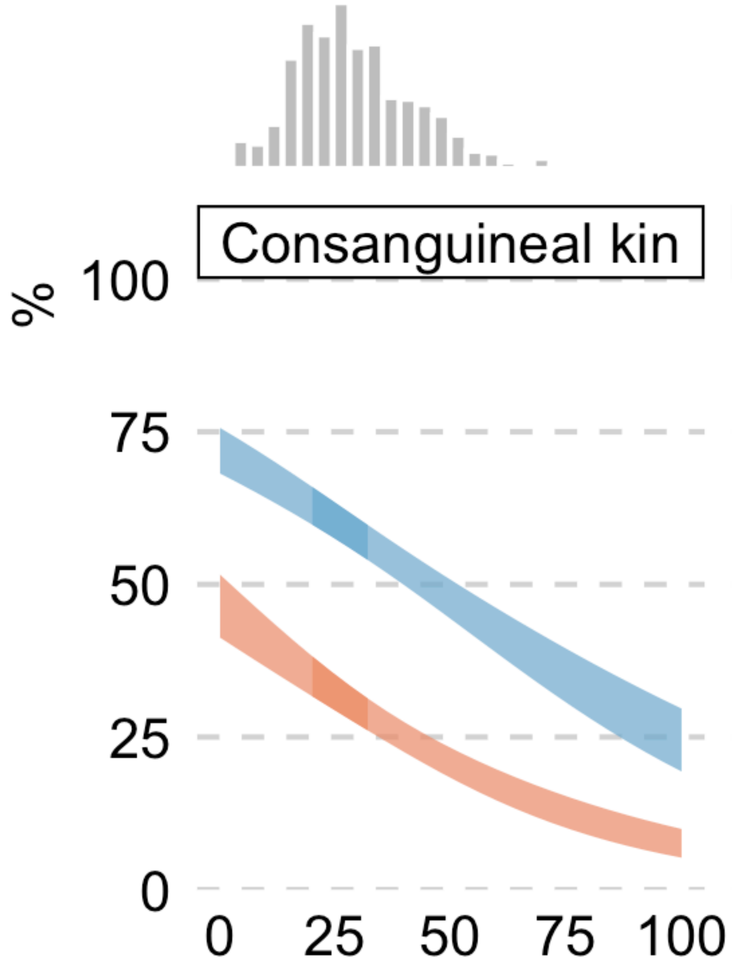
network
composition
density

outcomes
help with childcare
talk about having children
pressure parents
pressure friends

Women had on average 30% consanguineal kin, 10% affinal kin, and 60% non-kin in their personal networks



Reporting more kin decreases “pro-natal” perceptions

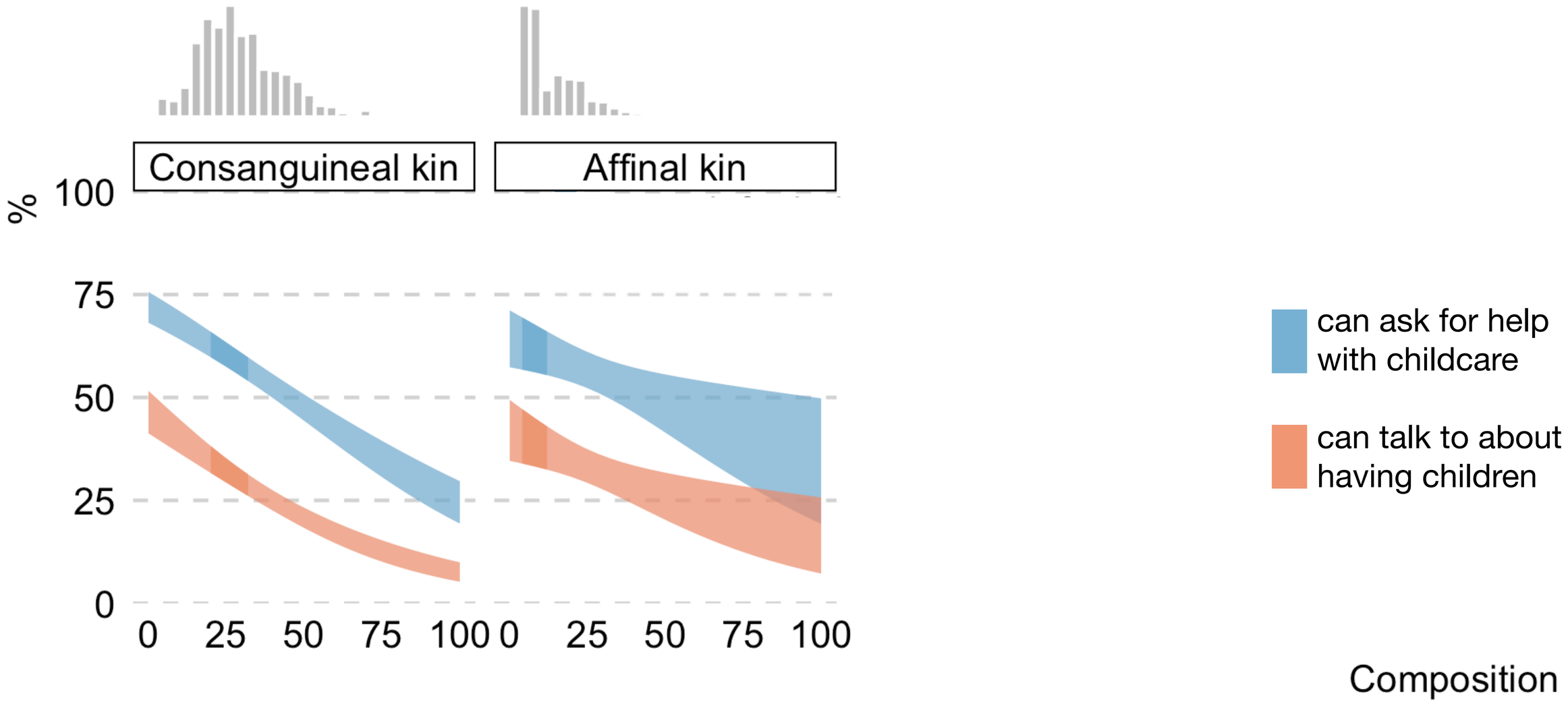


can ask for help with childcare

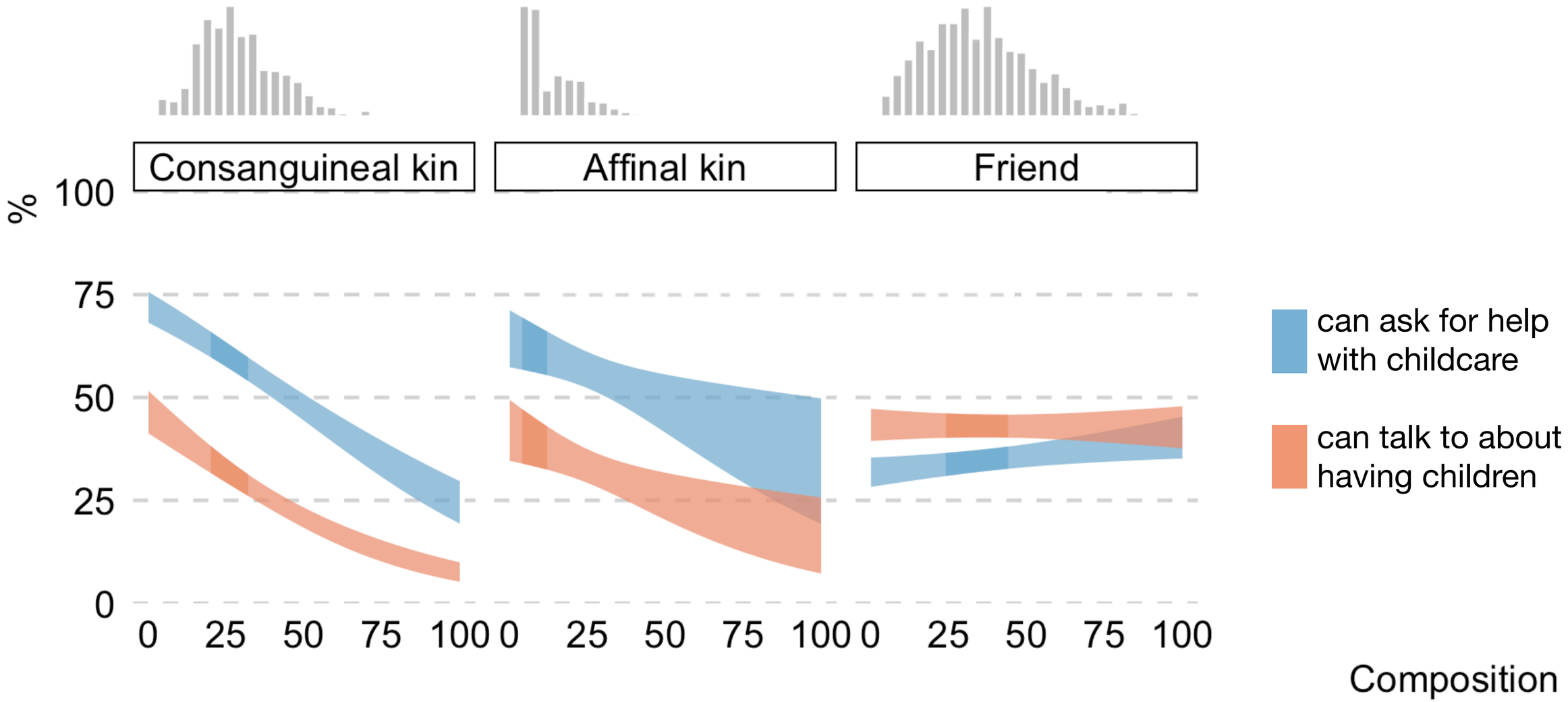
can talk to about having children

Composition

Reporting more kin decreases “pro-natal” perceptions



Reporting more kin decreases "pro-natal" perceptions, more friends raises perceptions of help slightly



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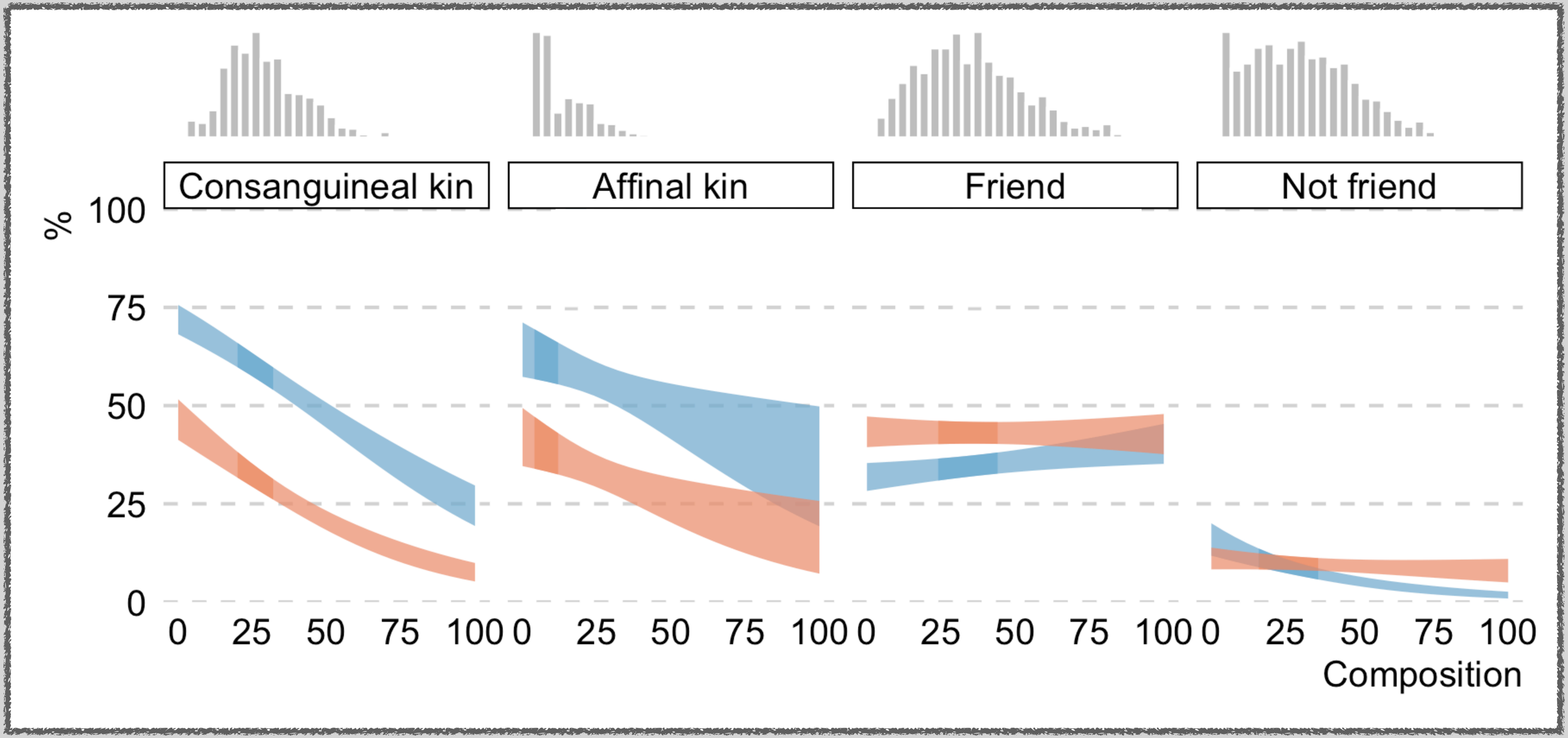
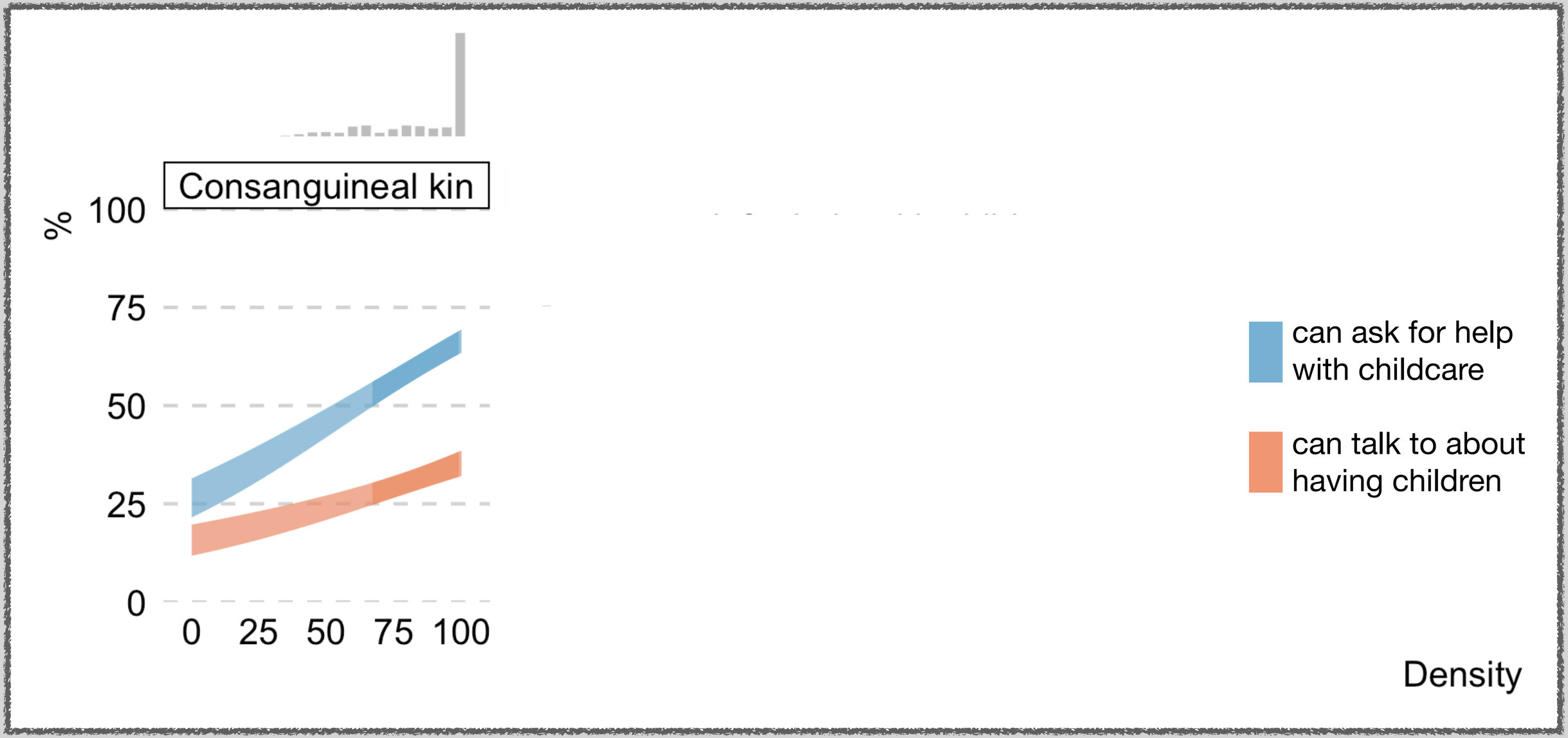


Density among kin increases “pro-natal” perceptions



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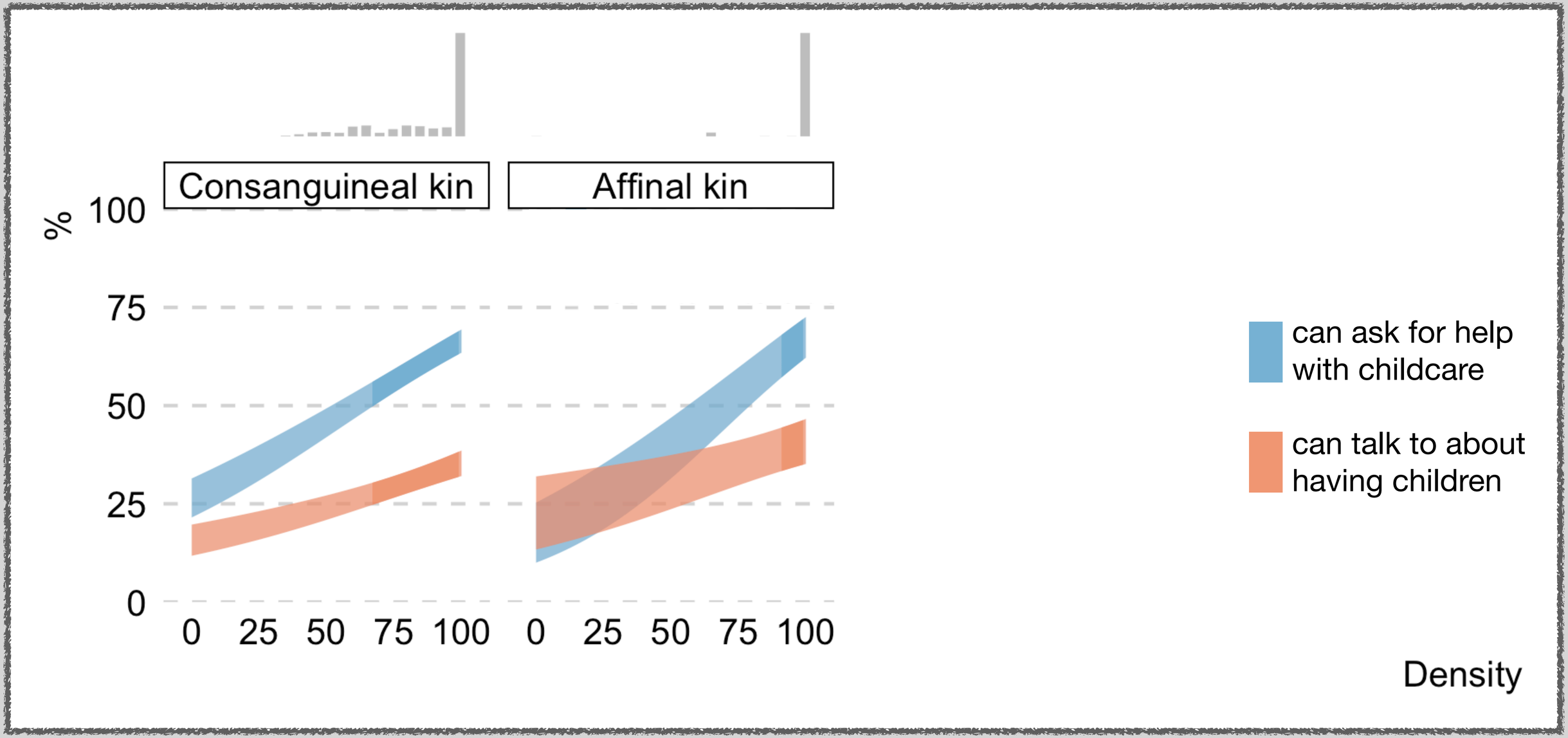
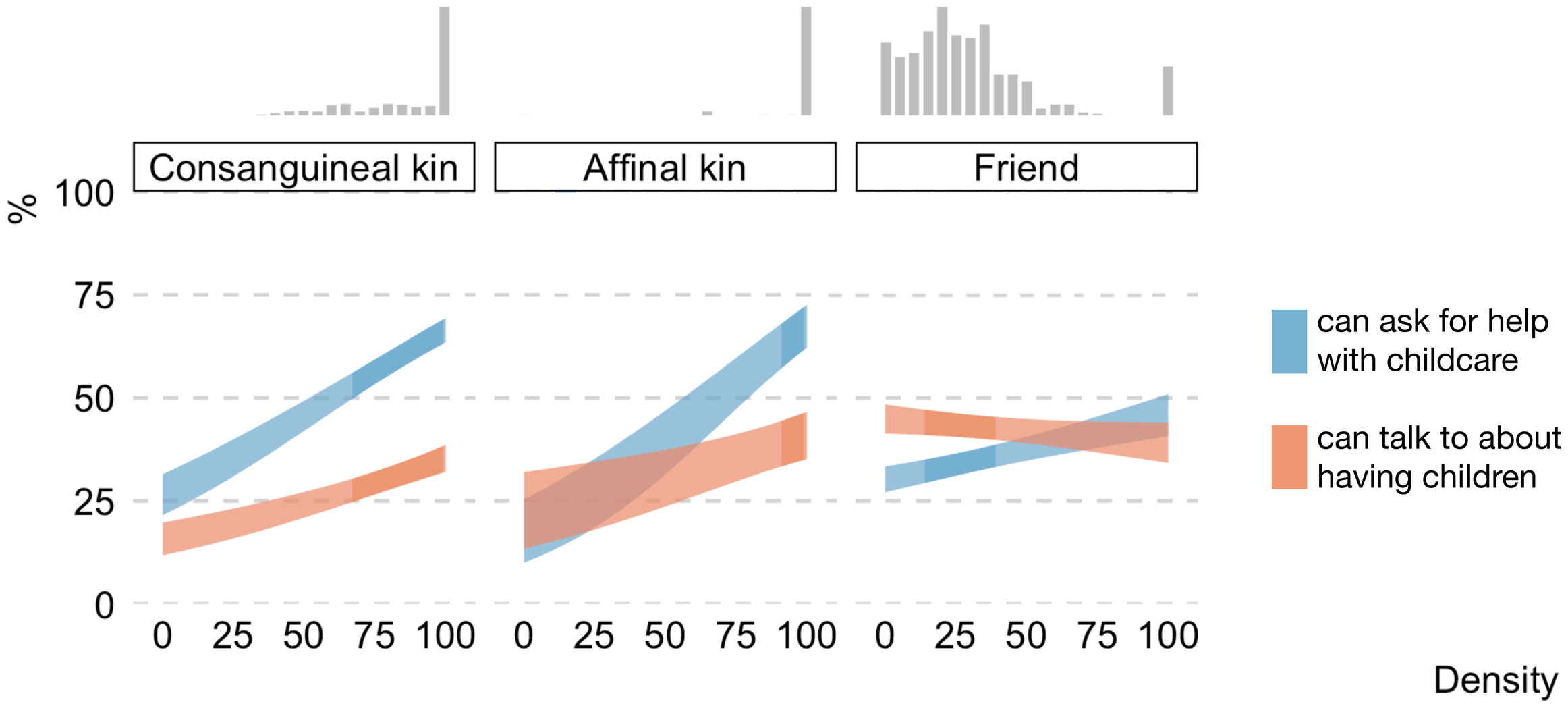


Density among kin increases “pro-natal” perceptions, density among friends decrease chances of talking about children



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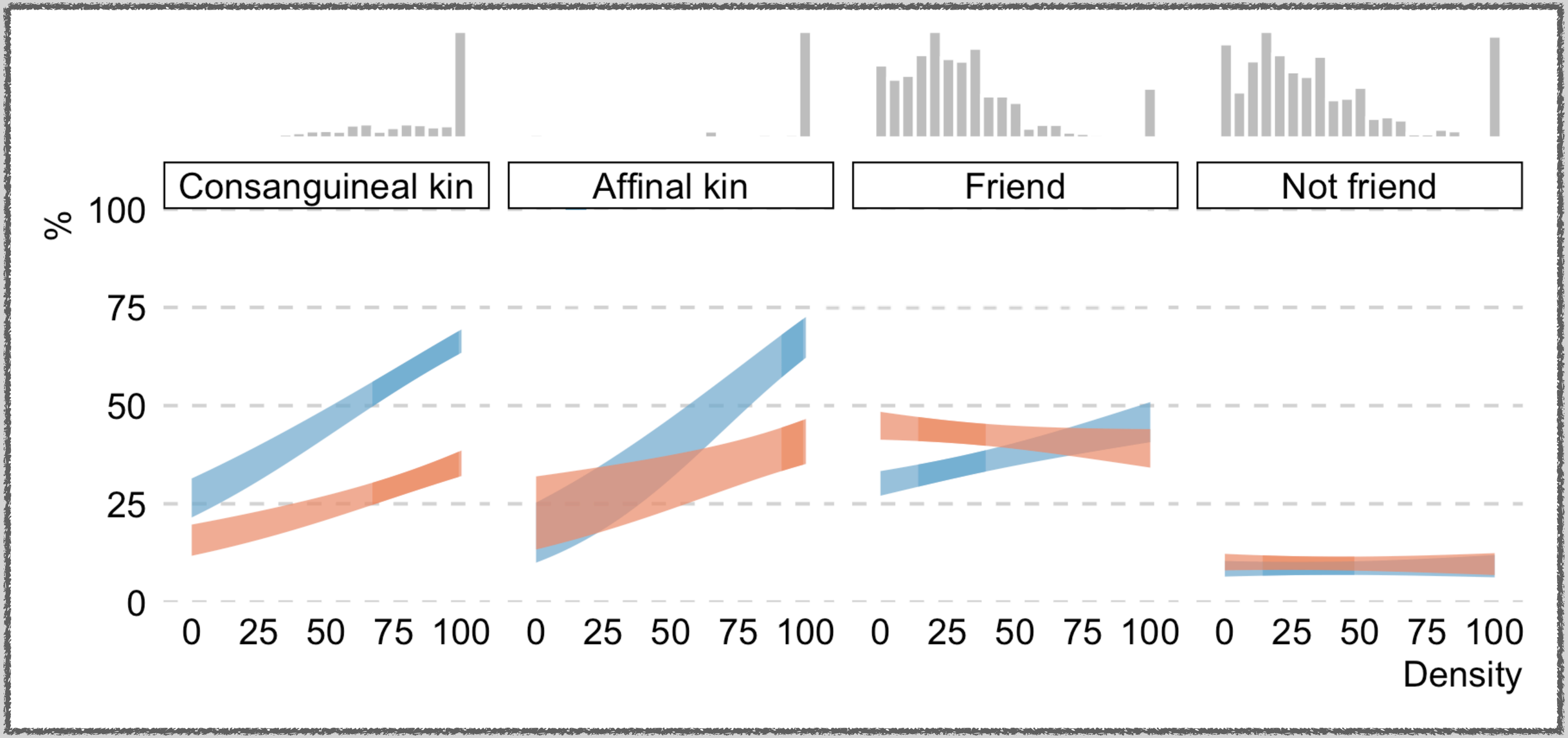


The Evidence

✓✓ kin most, friends often

✗ more kin, less support per-capita

✓ denser networks, more support

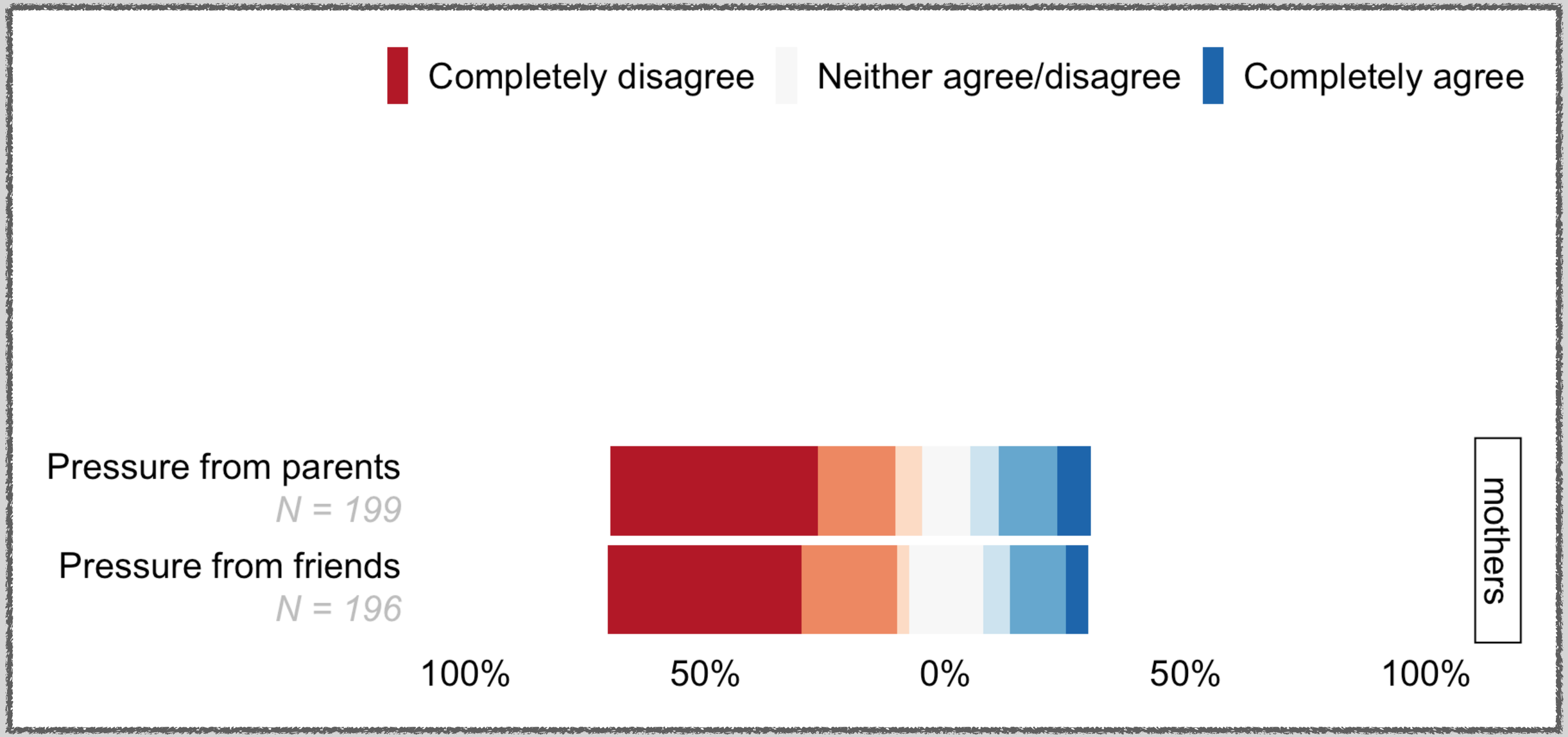
support

✗✗ friends more likely than kin

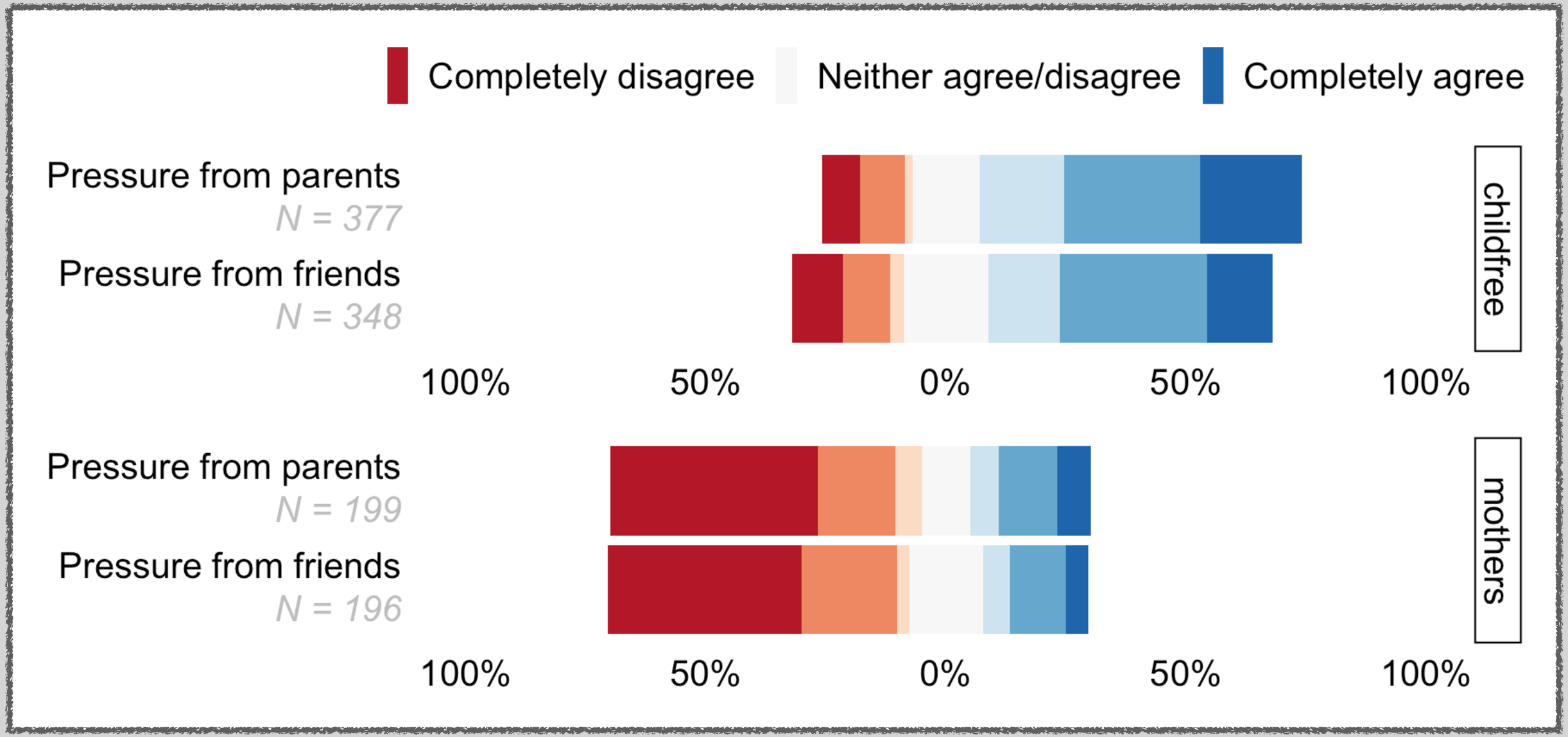
✗ more kin, less advice per-capita

✓ denser networks, more advice

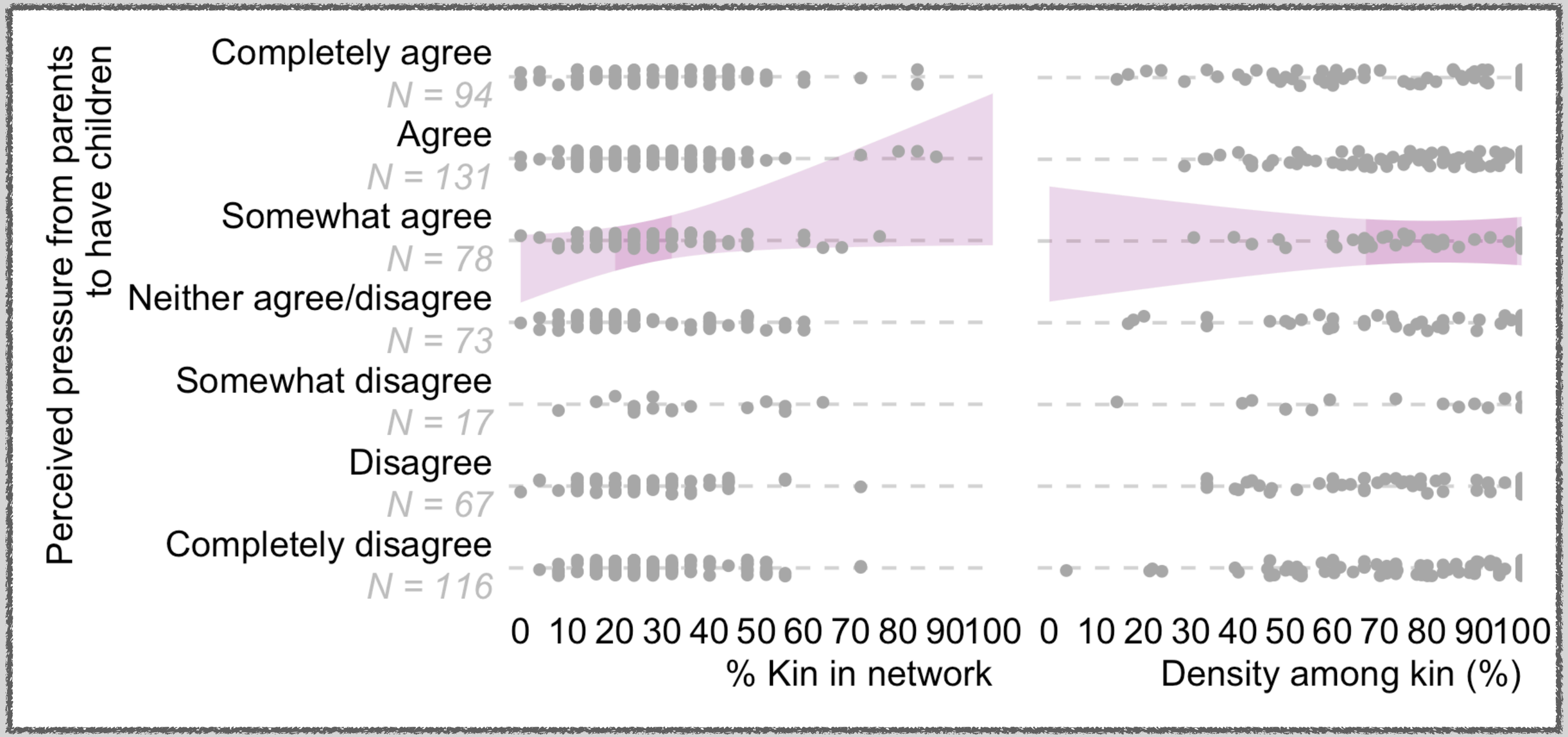
advice


Completely disagree
Neither agree/disagree
Completely agree
Pressure from parents
N = 199
Pressure from friends
N = 196
mothers
100%
50%
0%
50%
100%

Childfree women perceived more pressure than mothers, pressure from parents similar yet slightly higher than from friends



More kin in the network increased pressure but the effect was negligible, density was even more weakly related

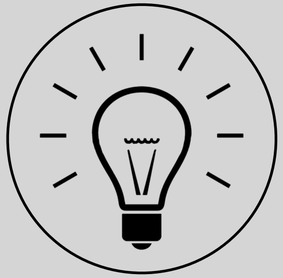


the Evidence

✓✓ kin most, friends often
✗ more kin, less support per-capita
✓ denser networks, more support

support

✗✗ friends more likely than kin
✗ more kin, less support per-capita
✓ denser networks, more advice



advice

✓ slightly more pressure from kin
✗ more kin, hardly more pressure
✗ denser networks, no extra pressure

pressure

Conclusion

networks made up of substantial fractions of kin

kin does not seem to be *overwhelmingly* pro-natal

network characteristics important for fertility outcomes

Conclusion

networks made up of substantial fractions of kin

kin does not seem to be *overwhelmingly* pro-natal

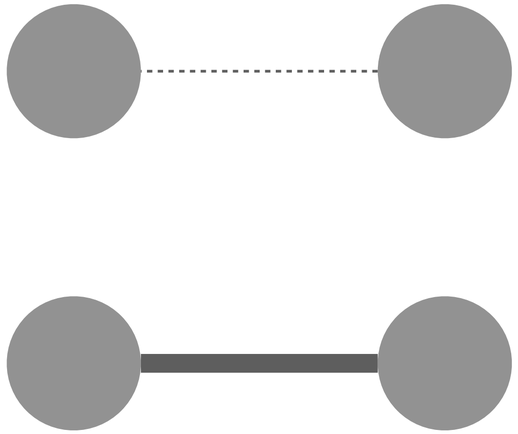
network characteristics important for fertility outcomes

PART I

PART II

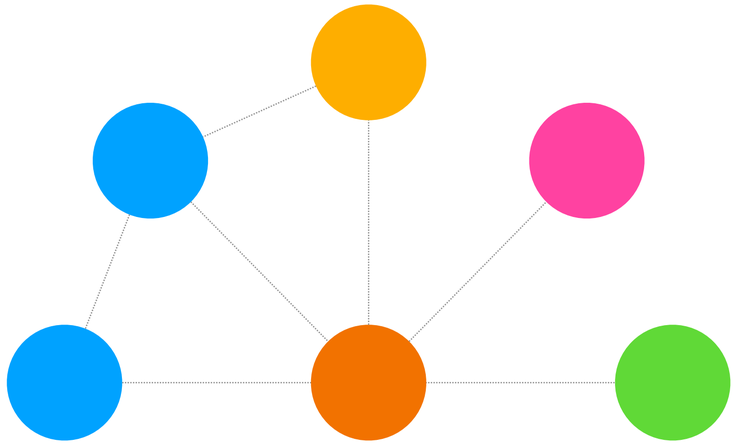
Personal Networks

tie (strength)



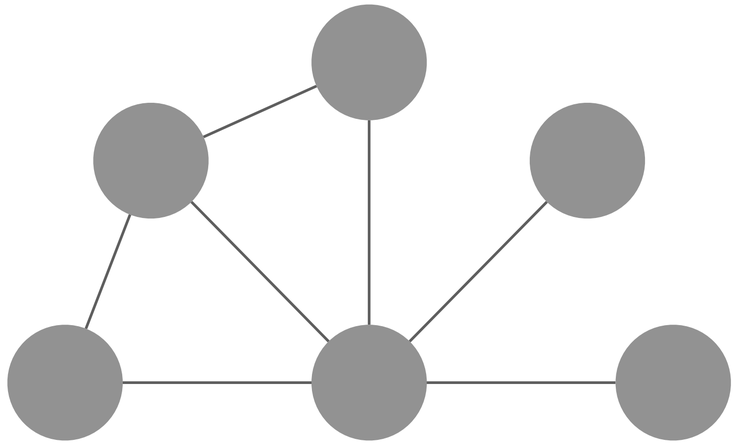
strong tie, more support/pressure
e.g., quality of relation with parent

composition



support network, diversity in ideas
e.g., # kin, # friends, # can help

structure



reinforcing norms, flow information
e.g., density, # cliques

Personal Networks

tie (strength)

average closeness
average f2f contact
average other contact

average closeness family
average closeness friends
average closeness childfree
…

composition

% family
% friends
% non-friends
% with children
% who want children
% childfree
% highly educated
% women
% can provide childcare
% can talk to about children

% highly-educated, childfree
…

structure

density
cliques
isolates
communities
maximum degree
degree centralisation
betweenness centralisation
…

density among family
density among friends
density among childfree
…

Animal Behaviour 168 (2020) 109–120

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Commentary

Is less more? A commentary on the practice of 'metric hacking' in animal social network analysis

Quinn M. R. Webber [a, *], David C. Schneider [a, b, c], Eric Vander Wal [a, c]

[a] Cognitive and Behavioural Ecology Interdisciplinary Program, Memorial University of Newfoundland, St John's, NL, Canada
[b] Department of Ocean Sciences, Ocean Sciences Centre, Memorial University of Newfoundland, St John's, NL, Canada
[c] Department of Biology, Memorial University of Newfoundland, St John's, NL, Canada

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[a] Cognitive and Behavioural Ecology Interdisciplinary Program, Memorial
[b] Department of Ocean Sciences, Ocean Sciences Centre, Memorial Univers
[c] Department of Biology, Memorial University of Newfoundland, St John's,

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Psychological Science
22(11) 1359–1366
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DOI: 10.1177/0956797611417632
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Joseph P. Simmons[1], Leif D. Nelson[2], and Uri Simonsohn[1]
[1]The Wharton School, University of Pennsylvania, and [2]Haas School of Business, University of California, Berkeley

Data-Driven Approach

ego
- age
- # children
- # partnership status
- educational level

tie strength
- average closeness
- average f2f contact
- average other contact
- average closeness family
- average closeness friends
- average closeness with children
- average closeness want children
- average closeness childfree
- average f2f family
- average f2f friends
- average f2f with children
- average f2f want children
- average f2f childfree
- average non-f2f family
- average non-f2f friends
- average non-f2f with children
- average non-f2f want children
- average non-f2f childfree

composition
- % family
- % friends
- % with children
- % want children
- % childfree
- % highly educated
- % women
- % can provide childcare
- % can talk to about children
- density

structure
- density family
- density friends
- density with children
- density want children
- density childfree
- # isolates
- # components
- # cliques
- betweenness centrality
- degree centrality
- eigenvalue centrality
- diameter

Data-Driven Approach

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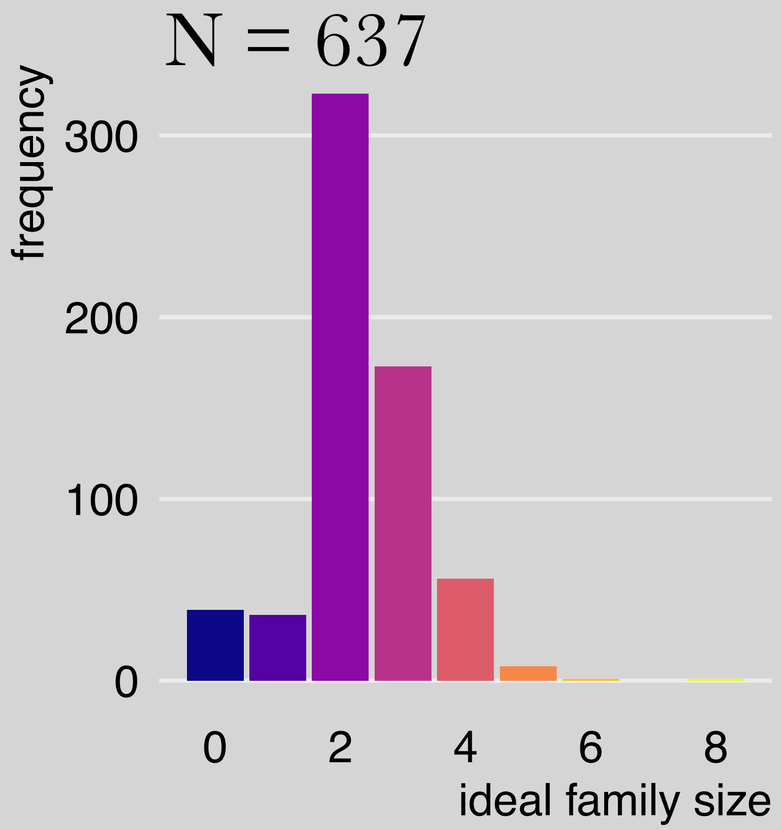

Data-Driven Approach

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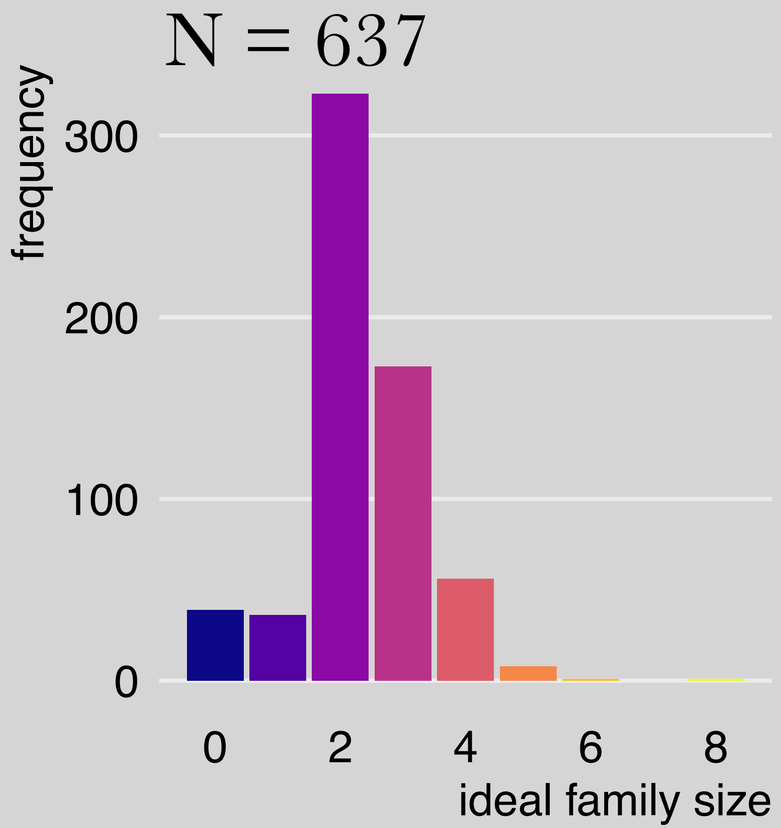


LASSO regression

$$\sum_{i=1}^{n}(y_i - \hat{y}_i)^2 + \lambda \sum_{j=1}^{p} | \beta_j |$$

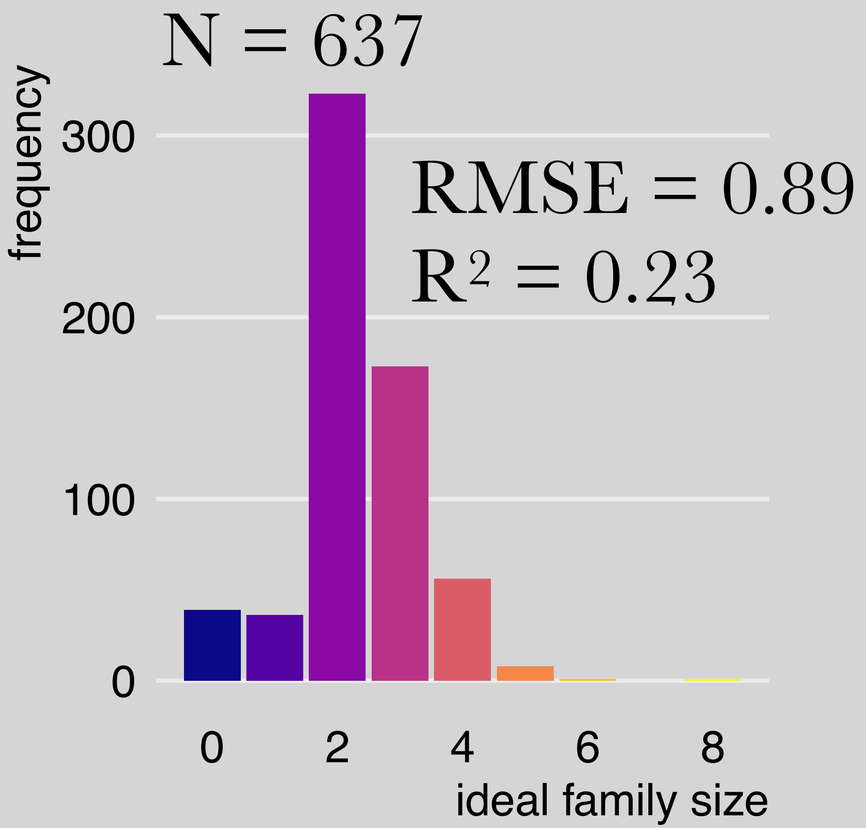
Data-Driven Approach

ego
- age
- # children

composition
- % family
- % want children
- % childfree
- % can talk to about children

tie strength
- average closeness childfree
- average f2f childfree

structure



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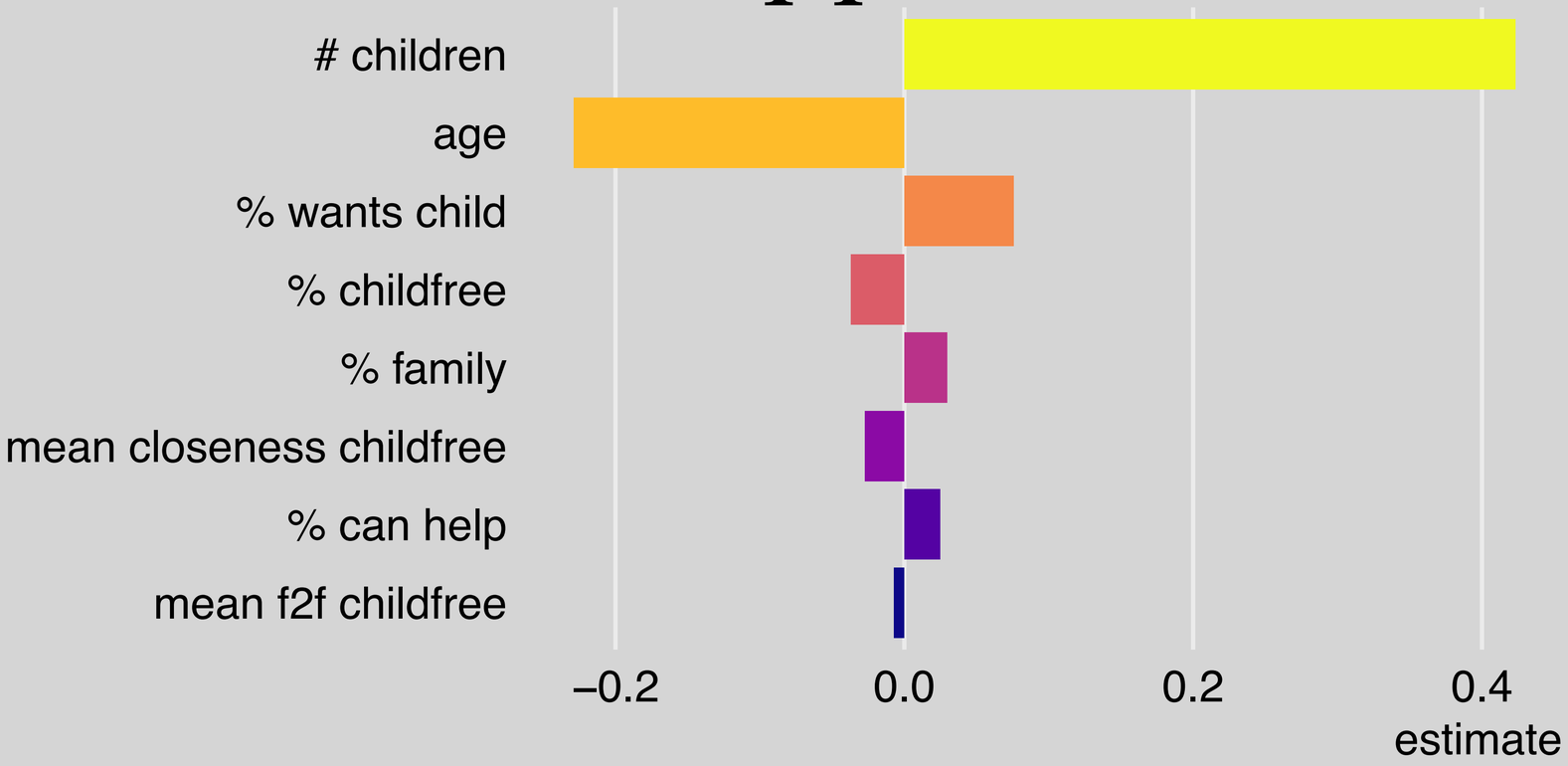
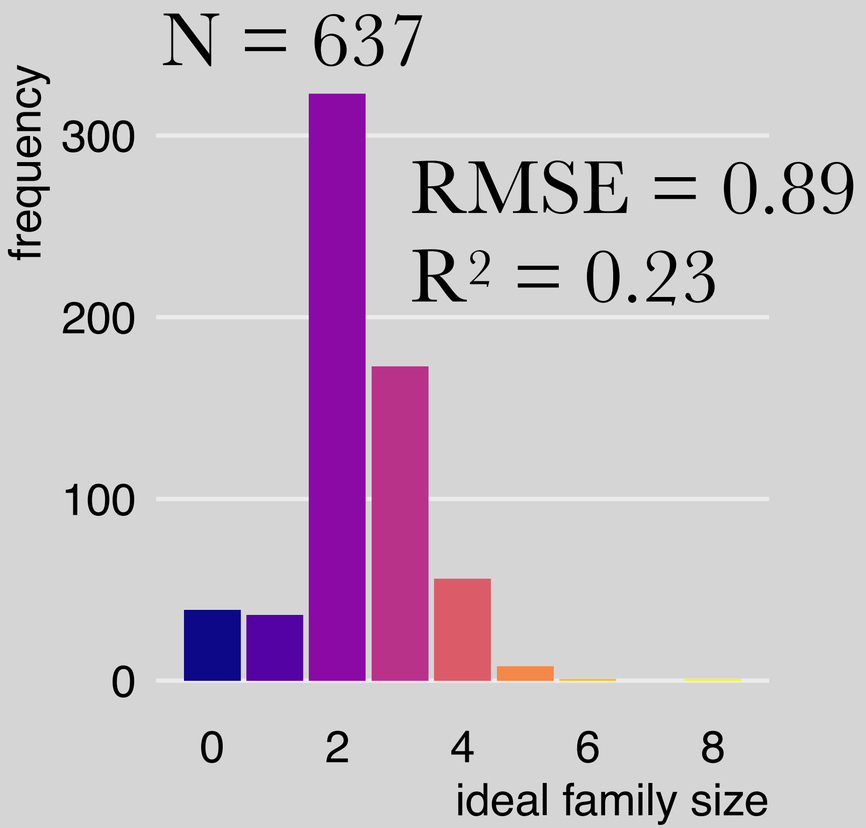
Data-Driven Approach



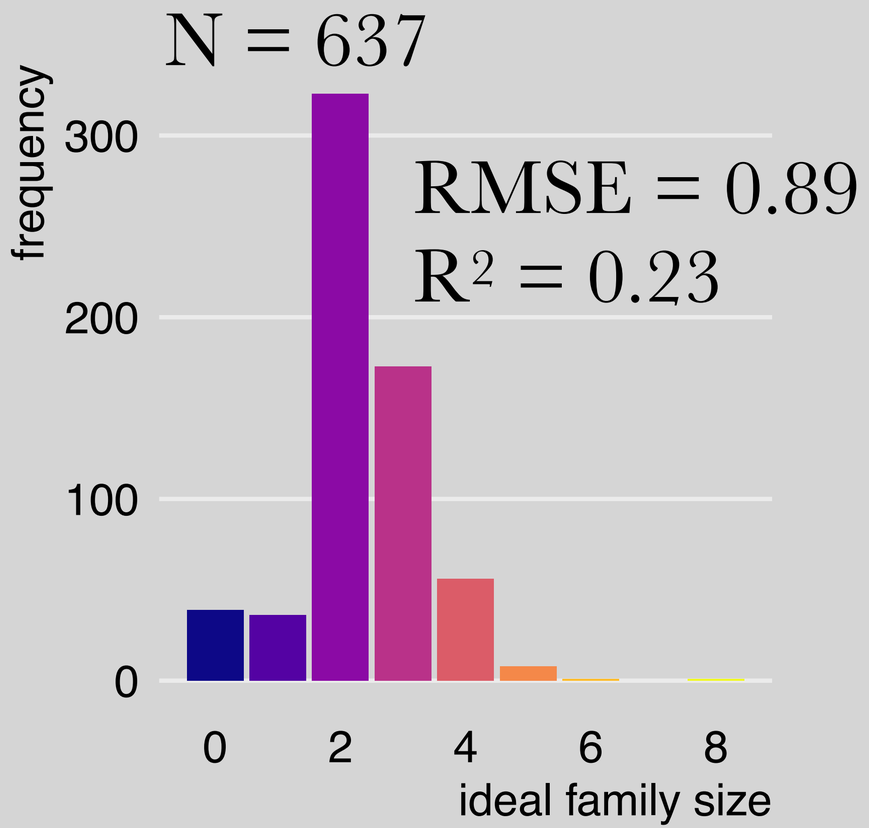


LASSO regression

$$\sum_{i=1}^{n}(y_i - \hat{y}_i)^2 + \lambda \sum_{j=1}^{p} | \beta_j |$$

Data-Driven Approach

Across alternative plausible samples:
$R^2 = 0.18$ [full model]
$R^2 = 0.15$ [ego characteristics]
$R^2 = 0.03$ [composition]
$R^2 = 0.00$ [structure]



linear regression:
4 'significant' vars
$R^2 = 0.35$

LASSO only ego:
RMSE = 0.90
$R^2 = 0.21$

LASSO childfree:
RMSE = 0.93
$R^2 = 0.13$

LASSO regression

$$\sum_{i=1}^{n}(y_i - \hat{y}_i)^2 + \lambda \sum_{j=1}^{p} | \beta_j |$$

the Future

exploring more (advanced) machine learning techniques

focus on “childfree”

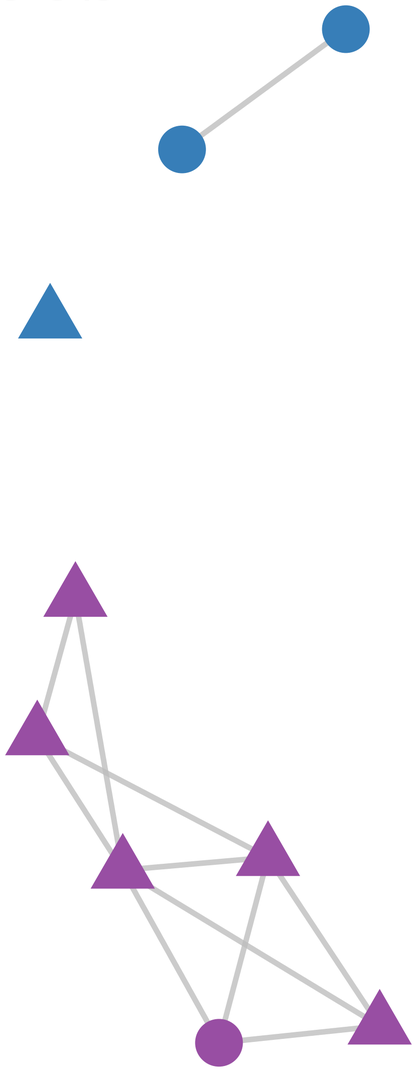
typology of networks through clustering methods

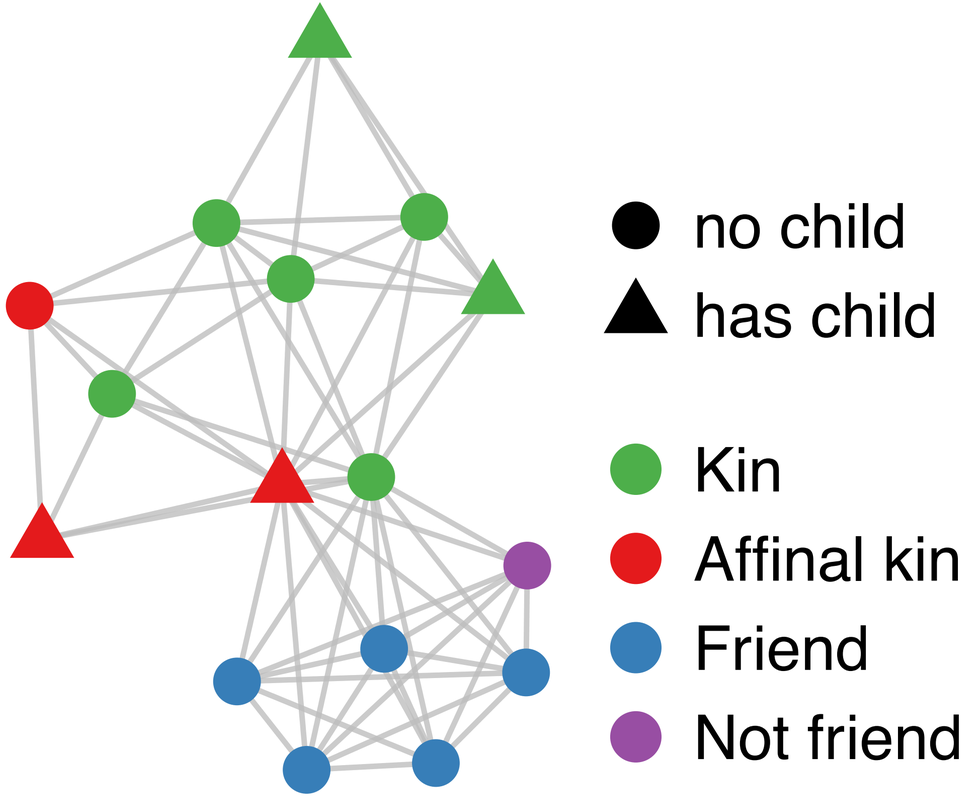
R-package FertNet for processing LISS data

making use of second wave of data collection

Collecting personal networks to study social influences on fertility behaviour

- Stulp, G. [Social Networks]
  Collecting large personal networks in a representative sample of Dutch women.
- Buijs, VL & Stulp, G. [Social Networks]
  Family, and Family Friends: Predicting Friendships of Dutch Women.
- Stadel, M & Stulp, G. [Social Networks]
  Balancing Bias and Burden in Personal Network Studies.
- Stulp, G & Barrett, L. [Social Sciences]
  Do data from large personal networks support cultural evolutionary ideas about kin and fertility?





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