

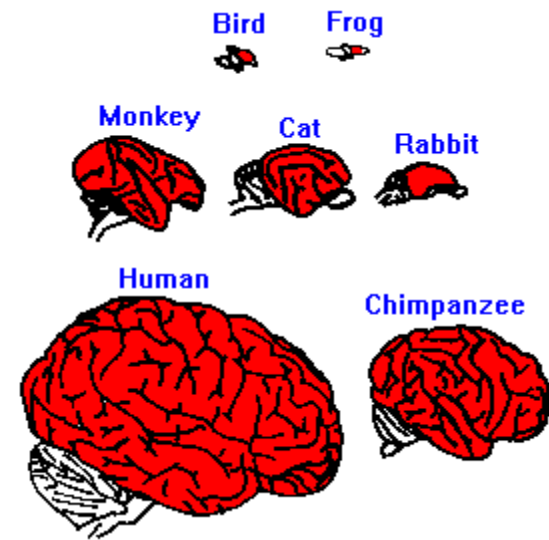
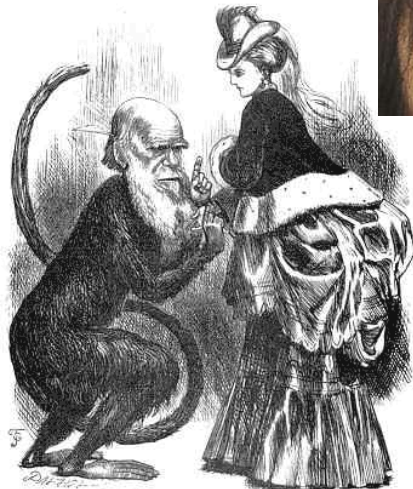
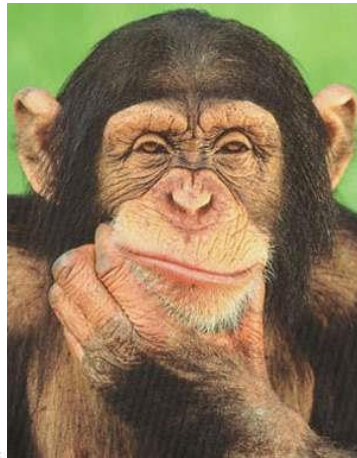


The Evolution of the Social Mind

Robin Dunbar

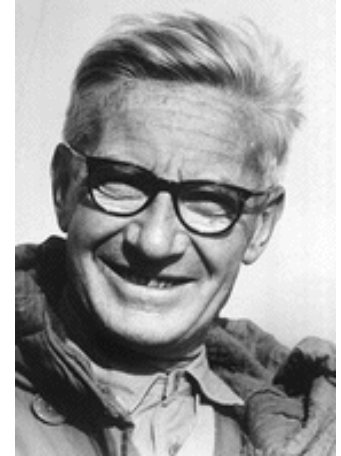
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Darwin's Legacy



- Darwin's main foci were speciation [*Origin*] and behaviour [*Descent of Man and Emotions*]
- Behaviour was a central part of that engine [because it allows individuals to solve ecological problems more successfully]
- The point of having a big brain is to allow more nuanced responses to ecological challenges

A Core Philosophical Principle



Niko Tinbergen
[1907-1988]

Nobel Prize for
Medicine 1973

Tinbergen's "Four *Whys*":

- **Mechanism** [What?] = cognition, physiology, contextual cues
- **Function** [Why?] = fitness consequences [**always** genetic fitness]
- **Ontogeny** [How?] = development [genes vs learning]
- **Phylogeny** [When?] = history [evolution meaning change]

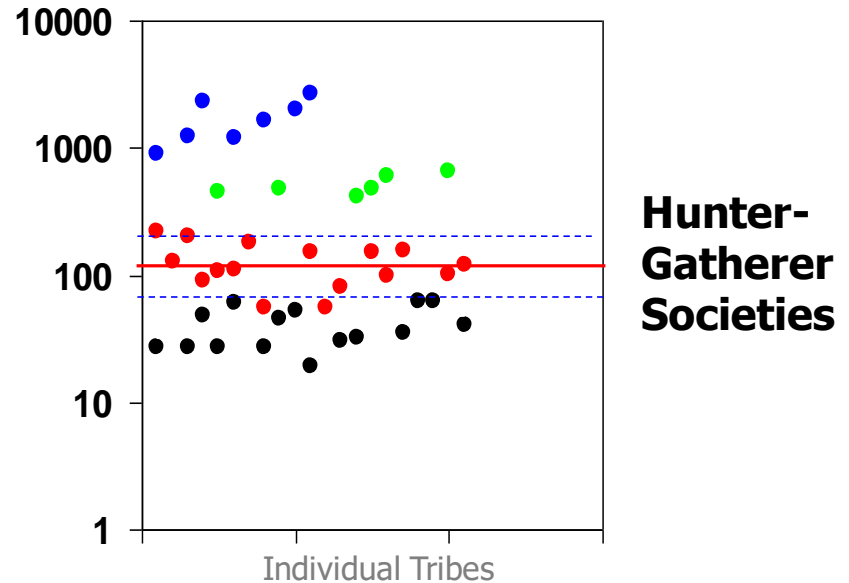
- Darwinian theory ["why"] provides the theoretical framework guiding and inspiring questions at the other levels AND the explanation for what we see
 - Understanding the mechanism ["what"] that brings about the function ["why"] may be as important as understanding the function itself

Human Social Groups

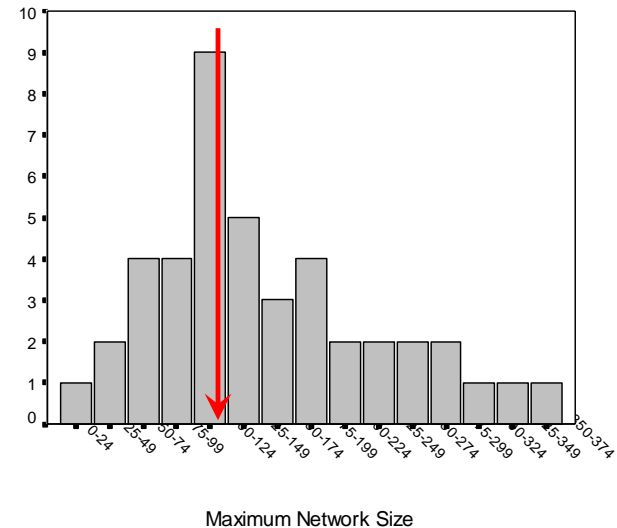
These all have mean sizes of 100-200

Neolithic villages 6500 BC	150-200
Modern armies (company)	180
Hutterite communities	107
'Nebraska' Amish parishes	113
business organisation	<200
ideal church congregations	<200
Domesday Book villages [1087 AD]	150
C18th English villages	160
GoreTex Inc's structure	150
Research sub-disciplines	100-200

Small world experiments	134
Hunter-Gatherer communities	148
Xmas card networks	154

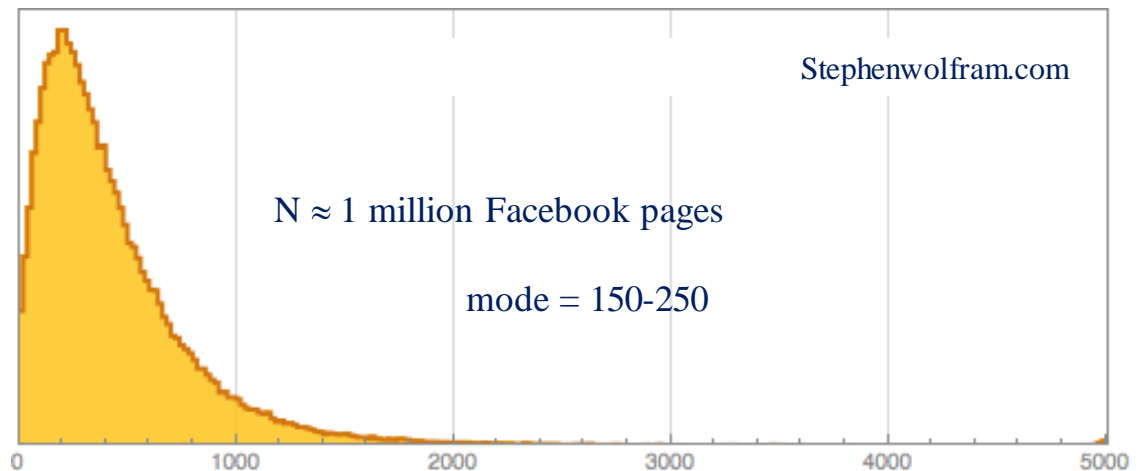
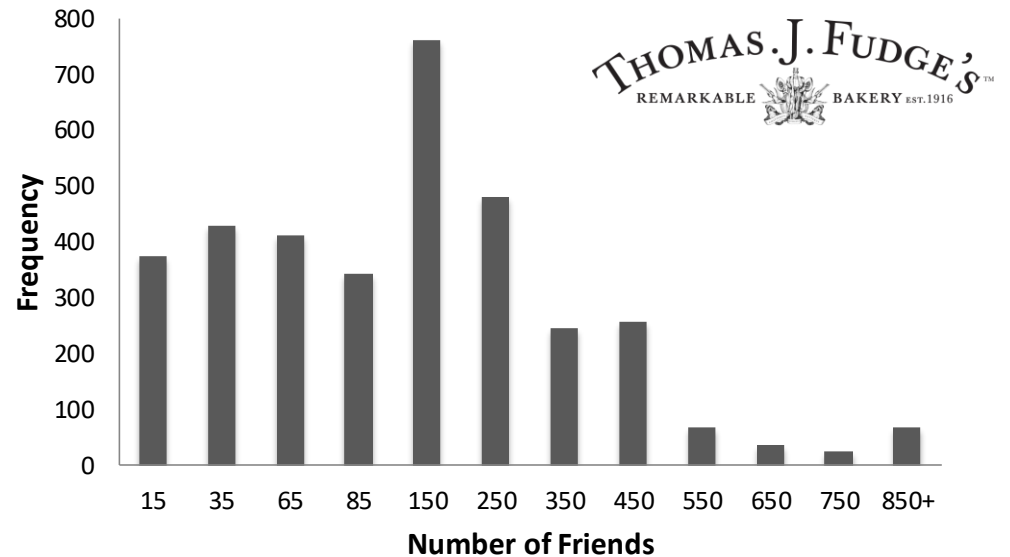


Xmas Card Networks

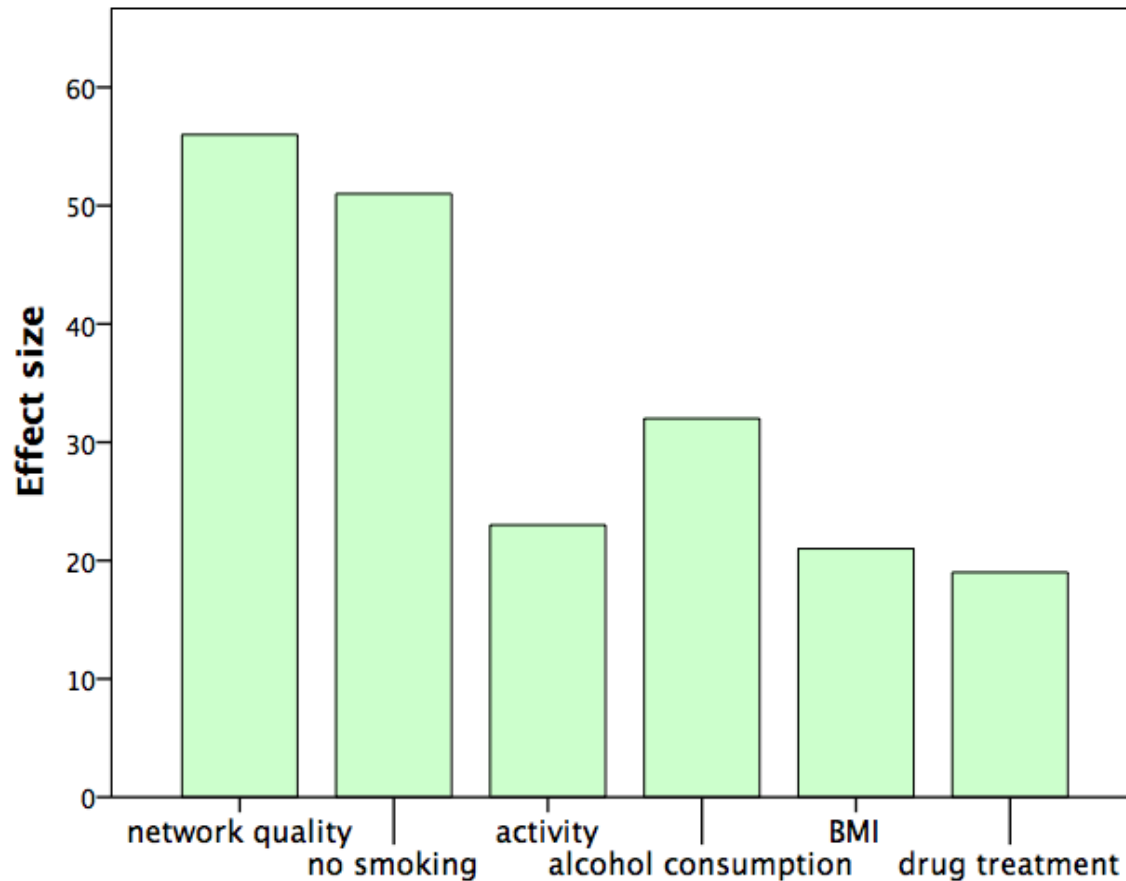


How Many Facebook Friends?

- Two UK stratified randomised samples
- Adult regular internet users
- N=3300 in total
- Mean age = 39 [18-65]
- Mean = 169.5



Why Your Network Matters



What best predicts your survival for the next 12 months after a heart attack?

Meta-analysis of 148 studies of heart attack patients

BUT...our friends are NOT all the same!



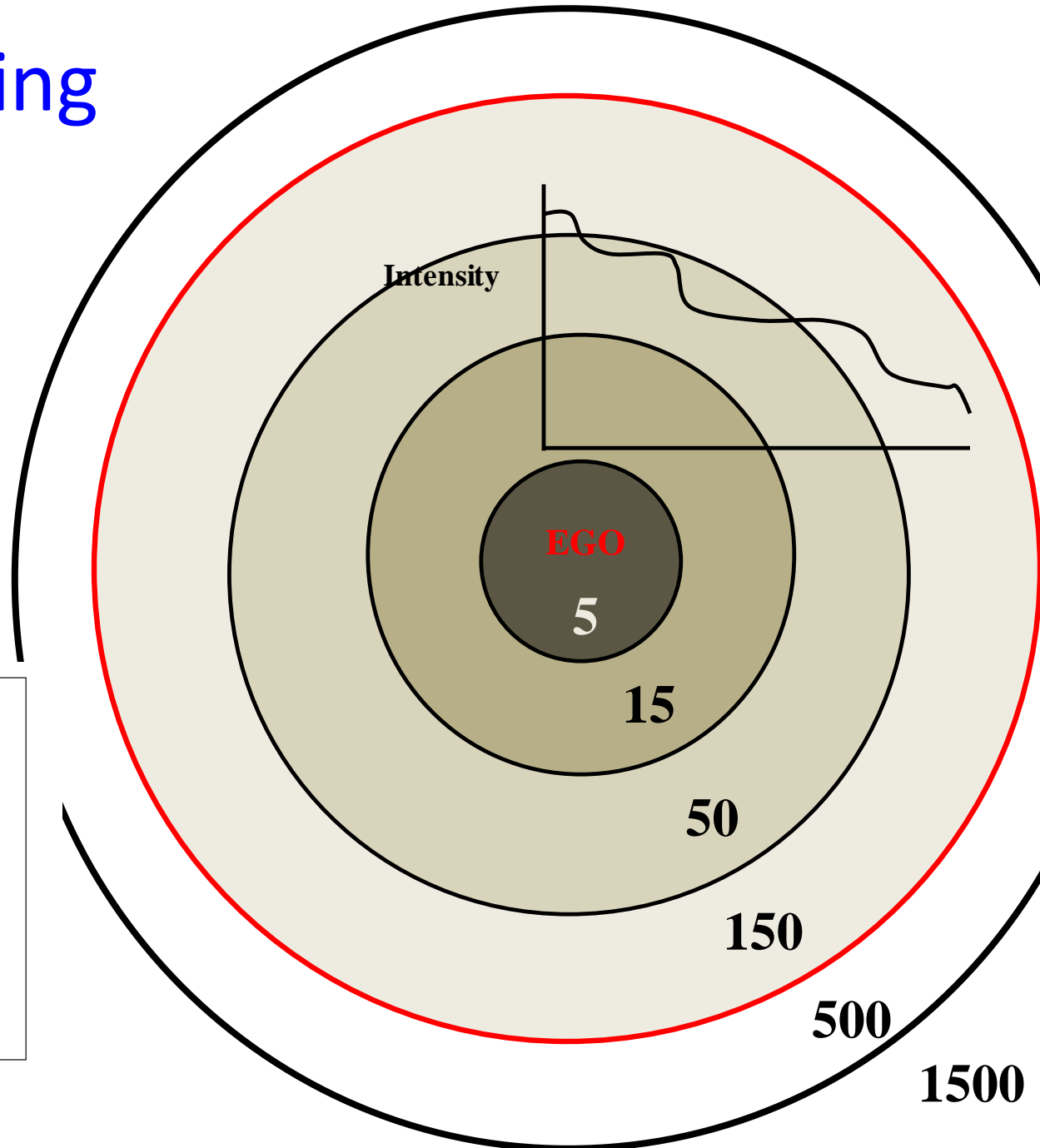
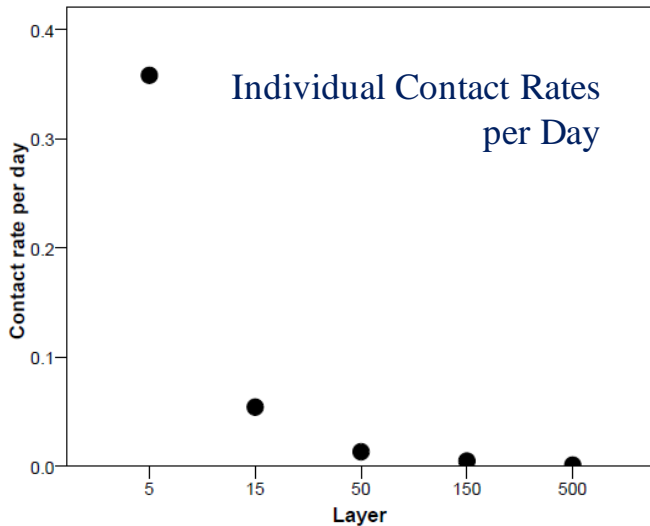
← Our social world is less like this

.....and more like this



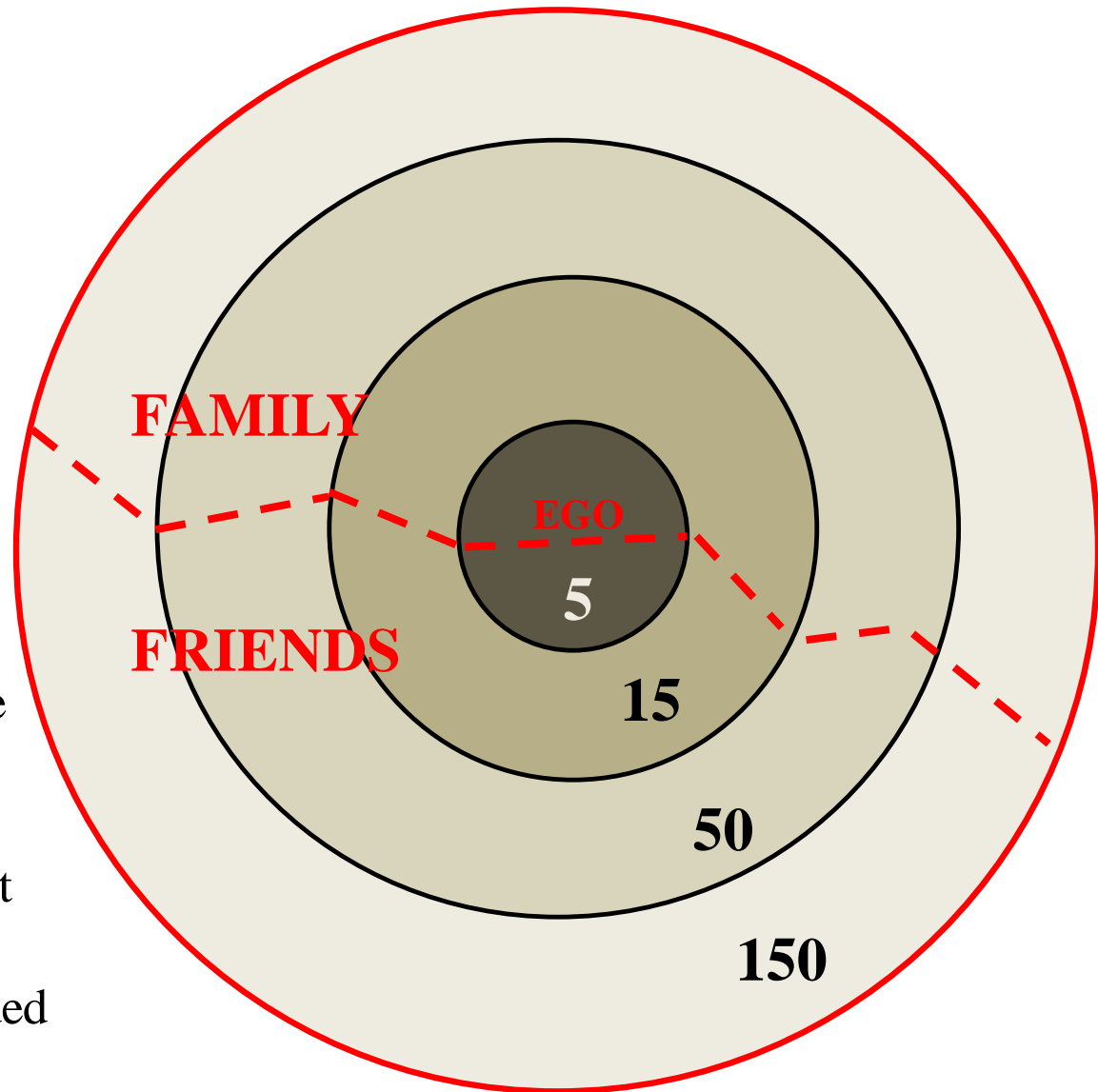
The Expanding Circles

Our relationships form a hierarchically inclusive series of circles of increasing size but decreasing intensity [ie quality of relationship]



The Divided Network

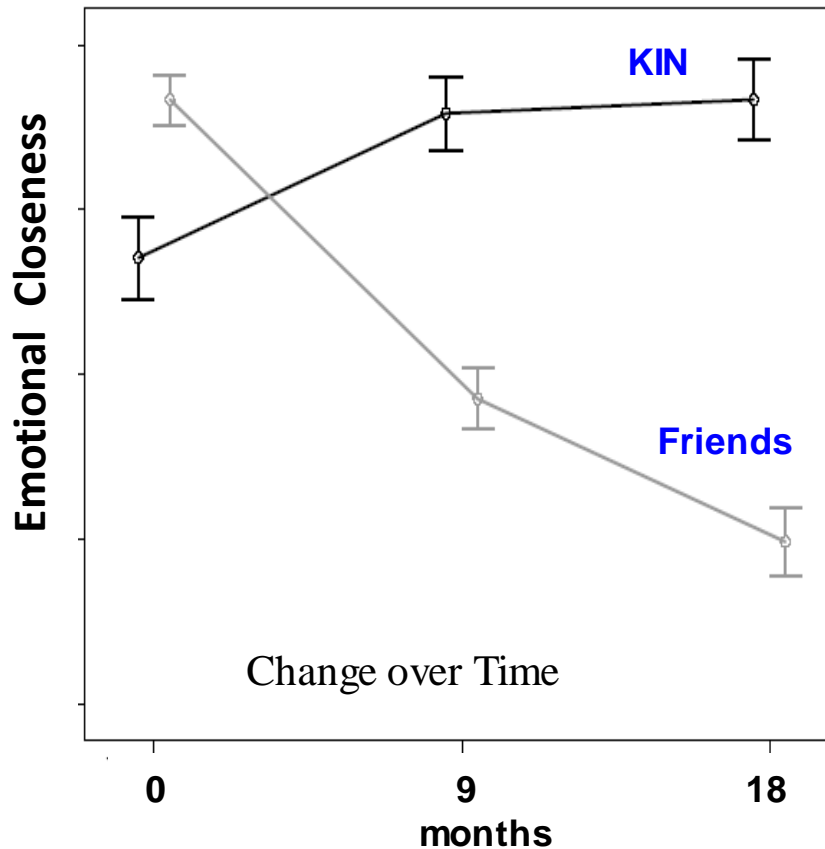
- The layers probably serve very different social functions for us
- In addition, our personal networks of ~150 actually consist of two quite separate [BUT inter-digitated] networks
 - typically a 50:50 split
- People who have big extended families have fewer friends



Stable Family, Fragile Friends

We have to work at friendships but 'kinships' come for free

Family will always support you come what may



Women who score high on neuroticism scale list fewer female kin

How Primates Make Relationships

Primate social bonds seem to involve two distinct components:

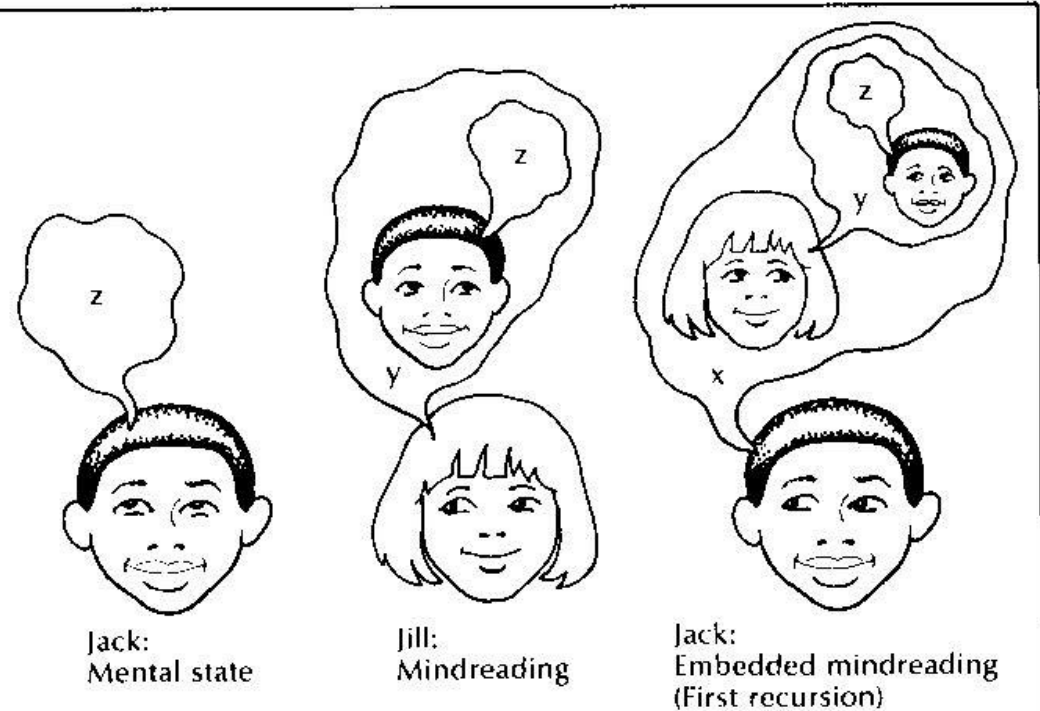
- An emotionally intense component
[=grooming]
- A cognitive component
[=brain size + cognition
= relationships of trust,
obligation and reciprocity]



The Limits to Intentionality...

A natural limit at 5th order
intentionality:

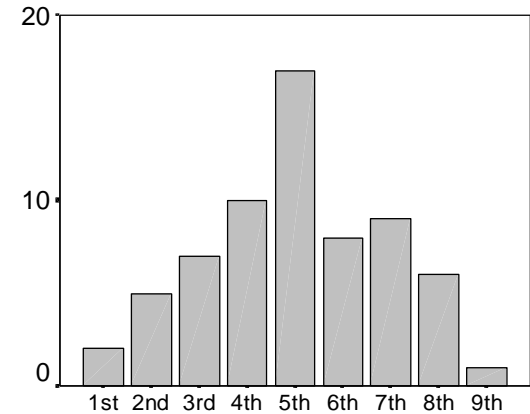
“I intend that you believe that
Fred understands that we
want him to be willing to
[do something]...” [level 5]



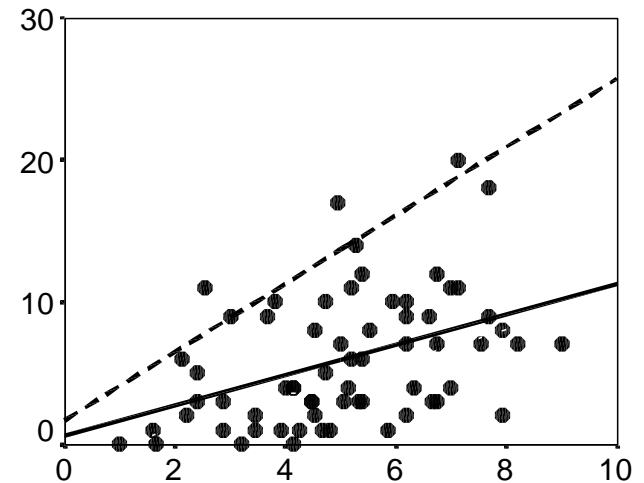
Cognitive Limits to Sociality?

- Achievable intentionality level indexed from stories
- 5th order seems to be the limit

- Intentionality correlates with size of support clique
[clique size = no. of core intimate relationships]

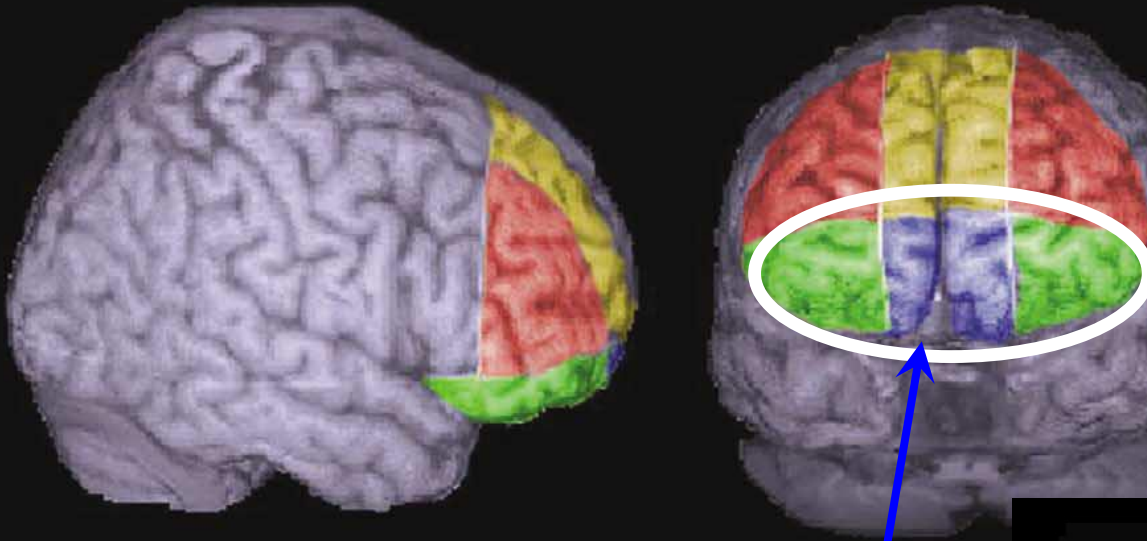


Level of intentionality



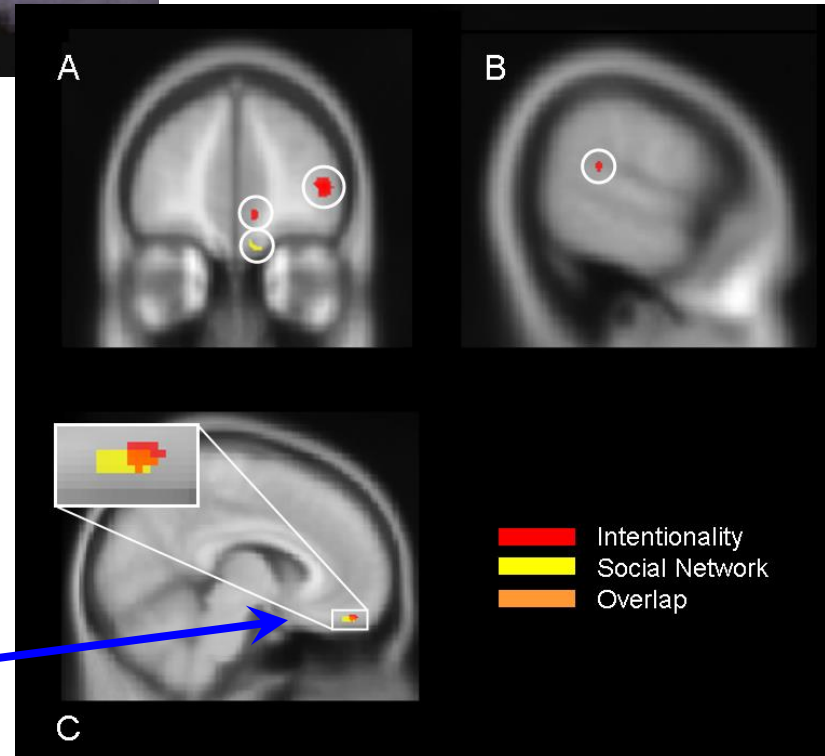
Level of intentionality

Insights from Neuroimaging



Powell et al. (2010, 2012, 2014); Kanai et al. (2011); PLUS Sallet et al. (2013) in macaques

- Neuroimaging reveals correlation between social network size and orbitofrontal PFC volume [and rest of ToM circuit] in humans AND macaques
- In a fine-grained VBM (voxel) analysis: overlap of network size and intentional competence in the ventromedial PFC

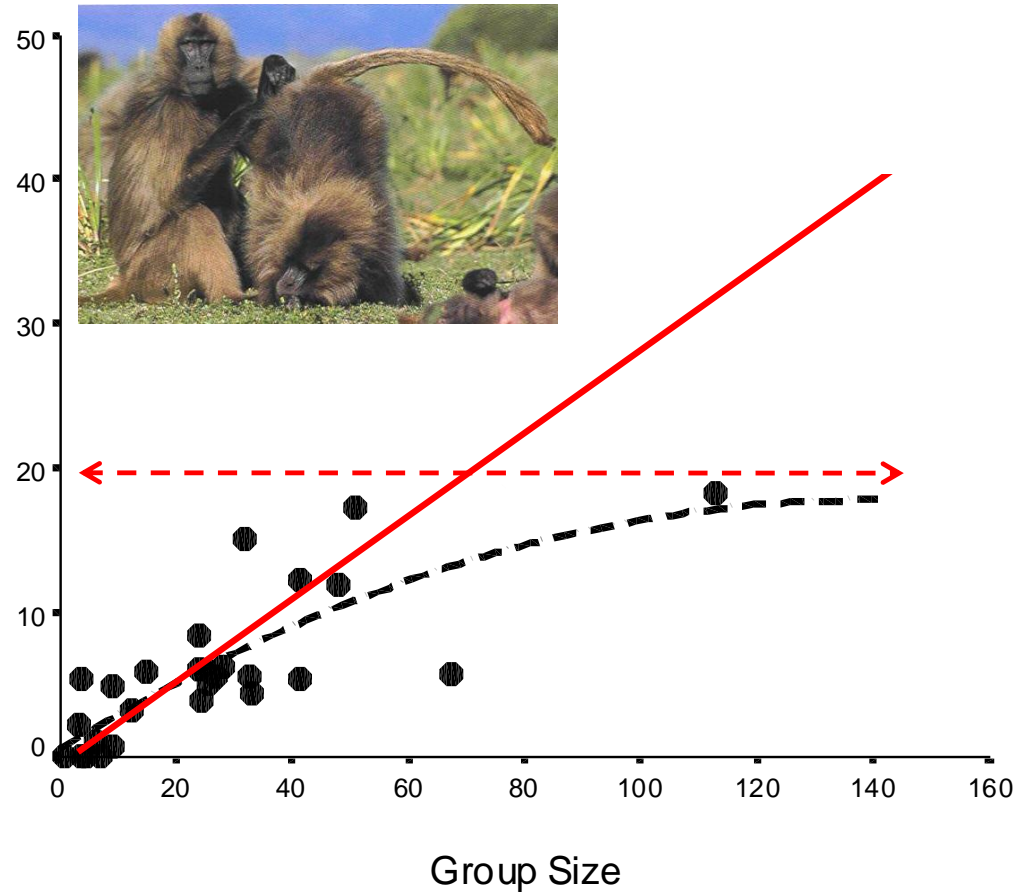


Why Time is Important

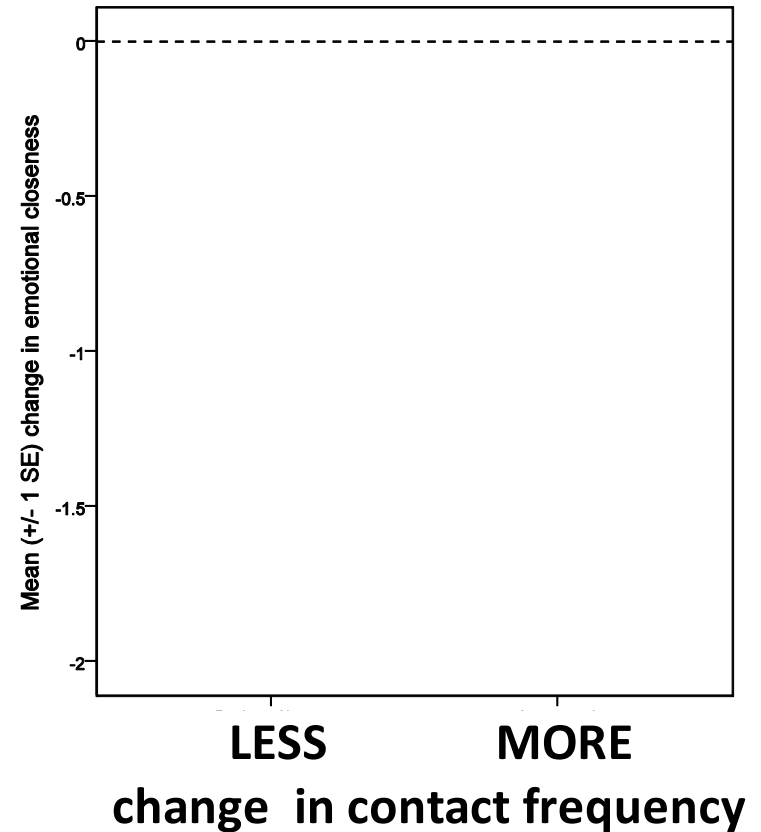
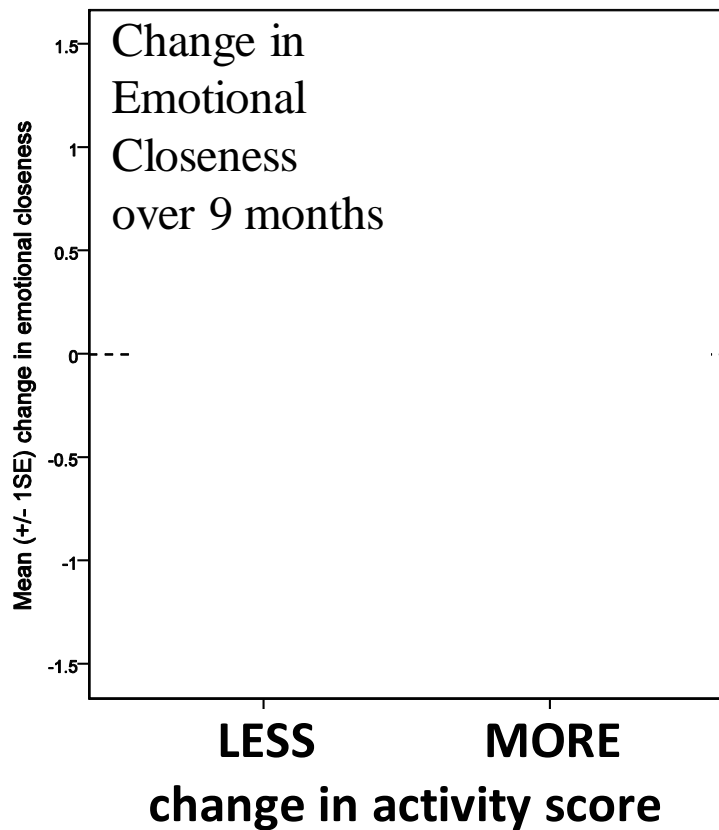


Why Time is Important

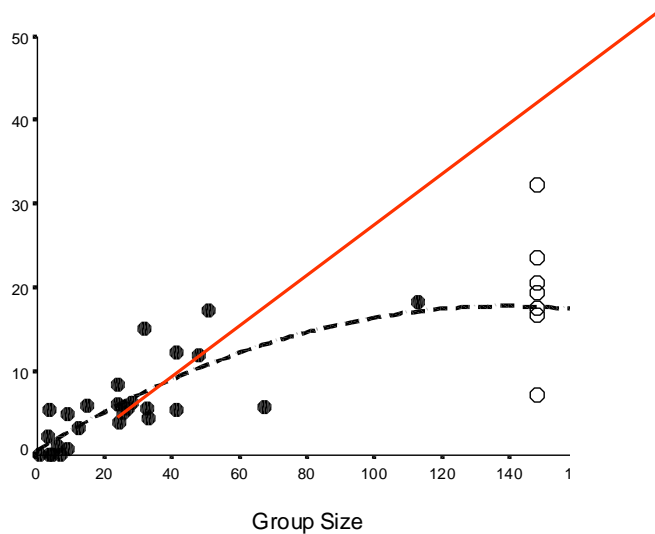
- Grooming as the bonding agent in primates
- Grooming time is determined by group size
- ...with an upper limit at about 20% of total daytime



How to Prevent Friendships Dying

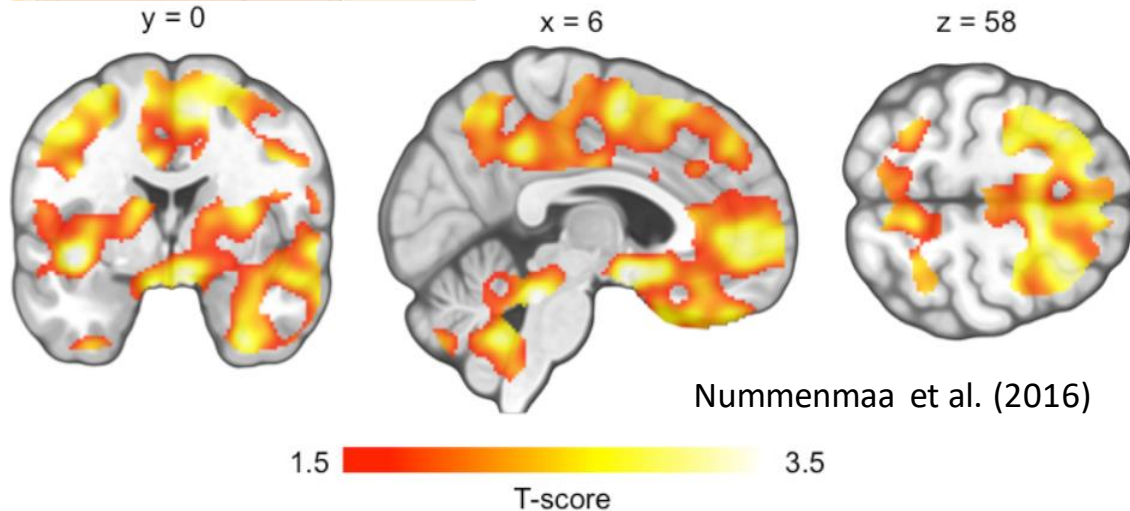


How Grooming Works

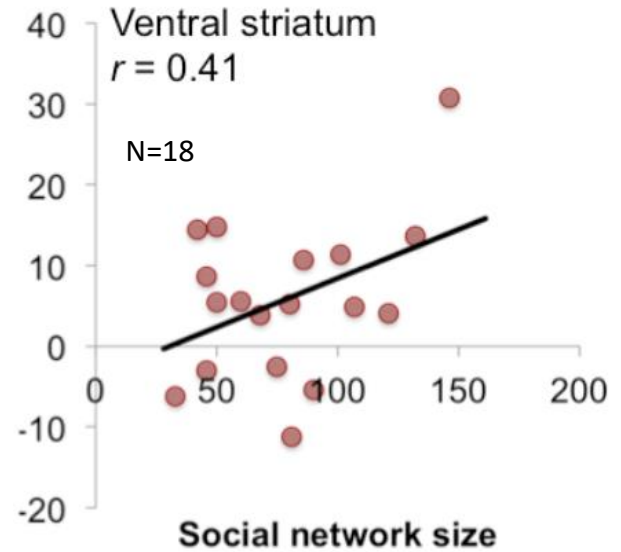


- Light stroking triggers endorphins in the brain in primates
- Endorphins are relaxing
- They create a psycho-pharmacological environment for building trust

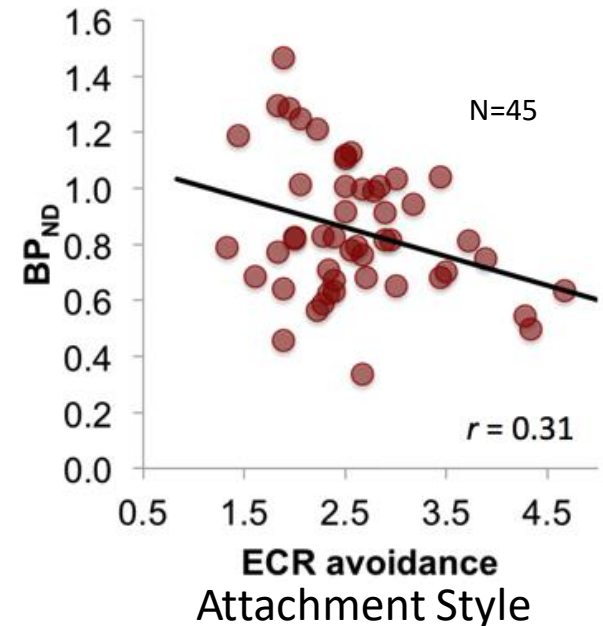
Grooming in Humans



- PET study using carfentanil as opiate antagonist [particular affinity to μ -receptors for β -endorphins] using light stroking
- Significant response in some key regions that suggest endorphin activation even to light touch

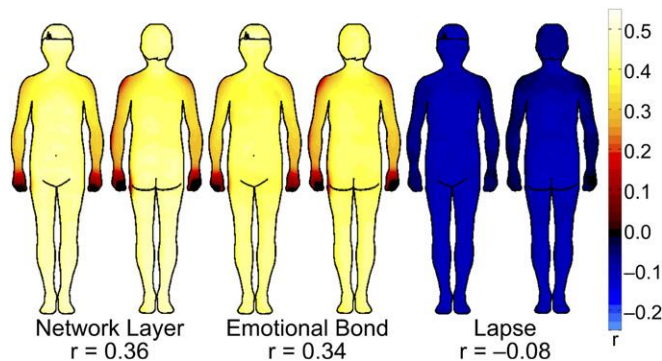
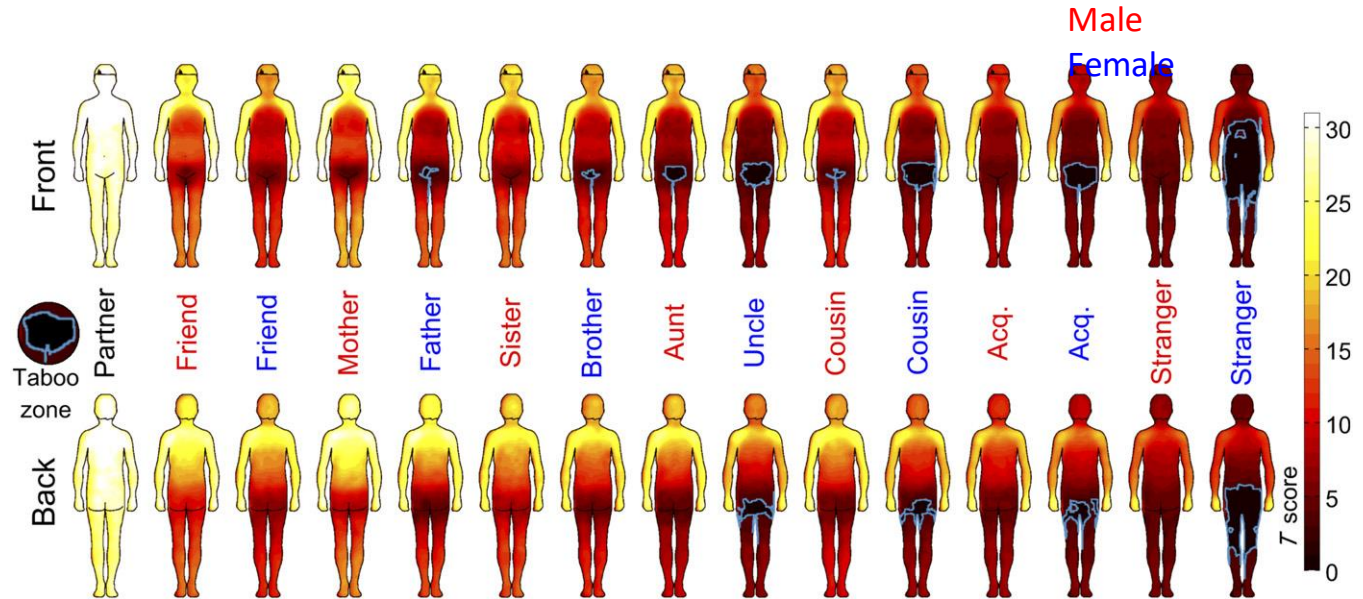


A) Orbitofrontal cortex



Social Importance of Touch

Where touch is allowed depends on relationship quality



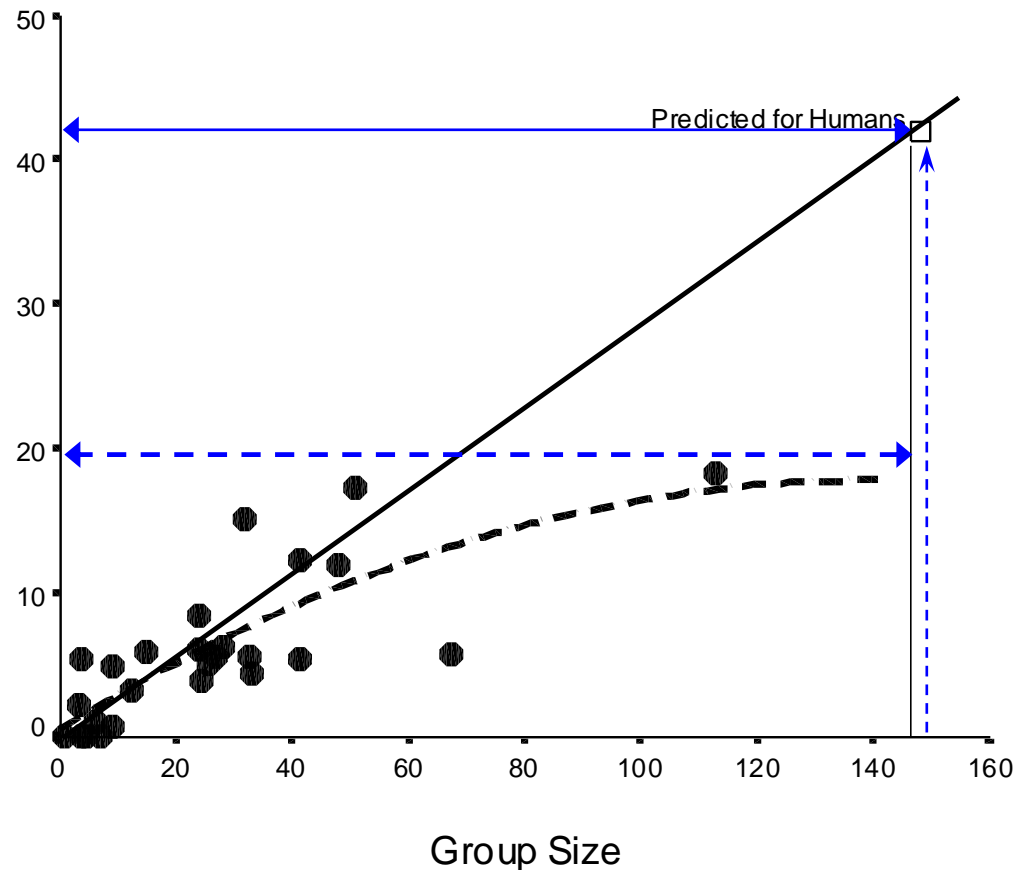
Correlation between allowable touch and status

Suvilehto et al. (2015)

Grooming Time in Humans?

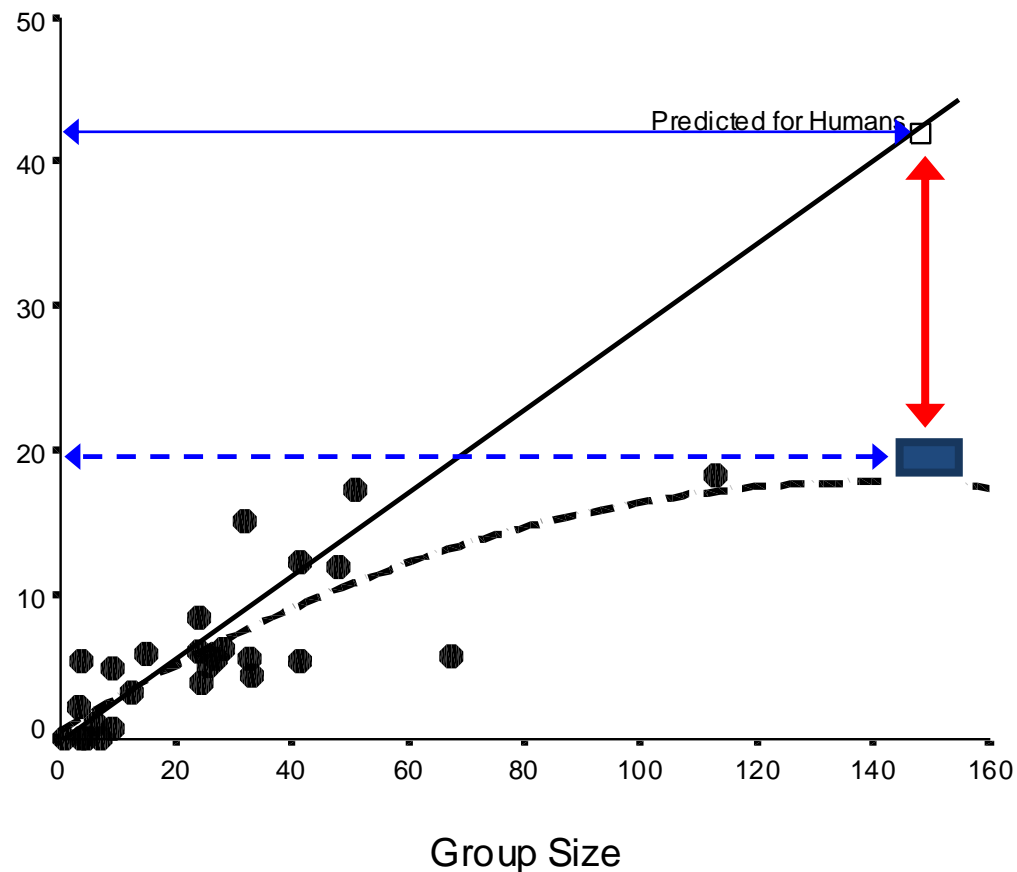
- If we bonded our groups using the standard primate mechanism

....we would have to spend ~43% of the day grooming

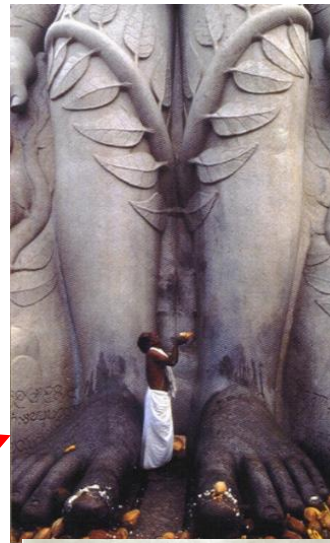
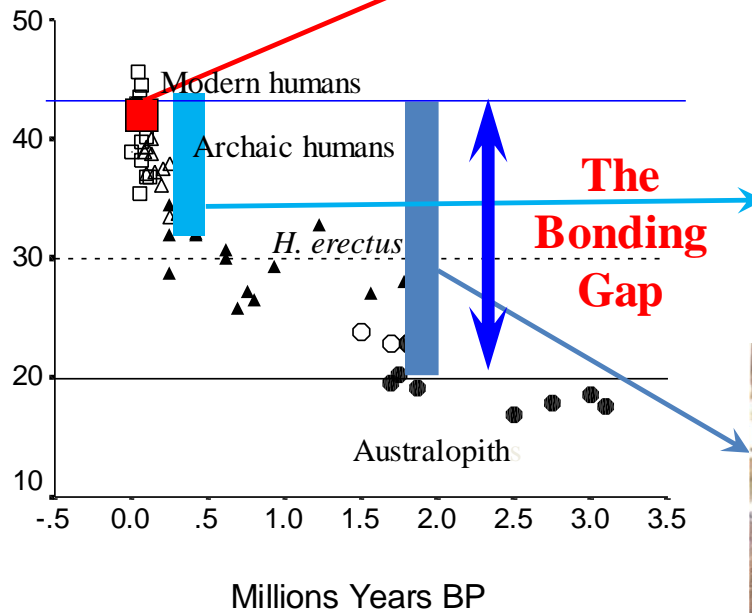


Grooming Time in Humans?

- In fact, we spend only 20% of our time in social interaction
.....from a sample of 7 societies from Dundee to New Guinea
- How do we bond our super-large communities?



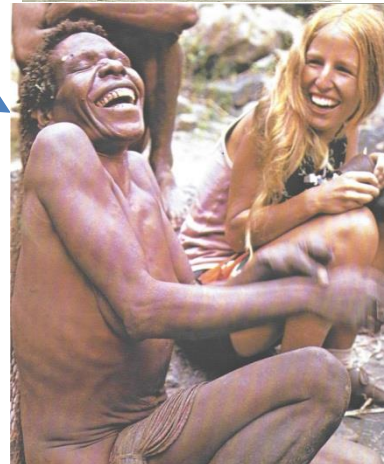
The Three Ways We Bridged the Gap



Language and the rituals of religion

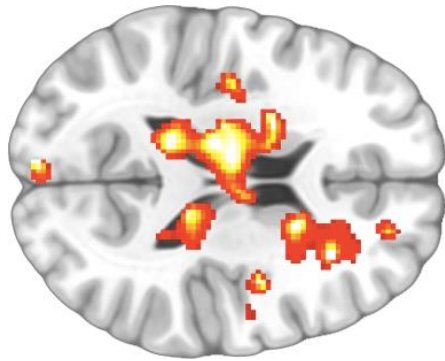
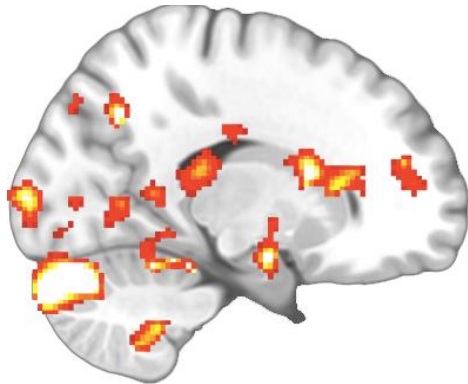


Music/singing and dance

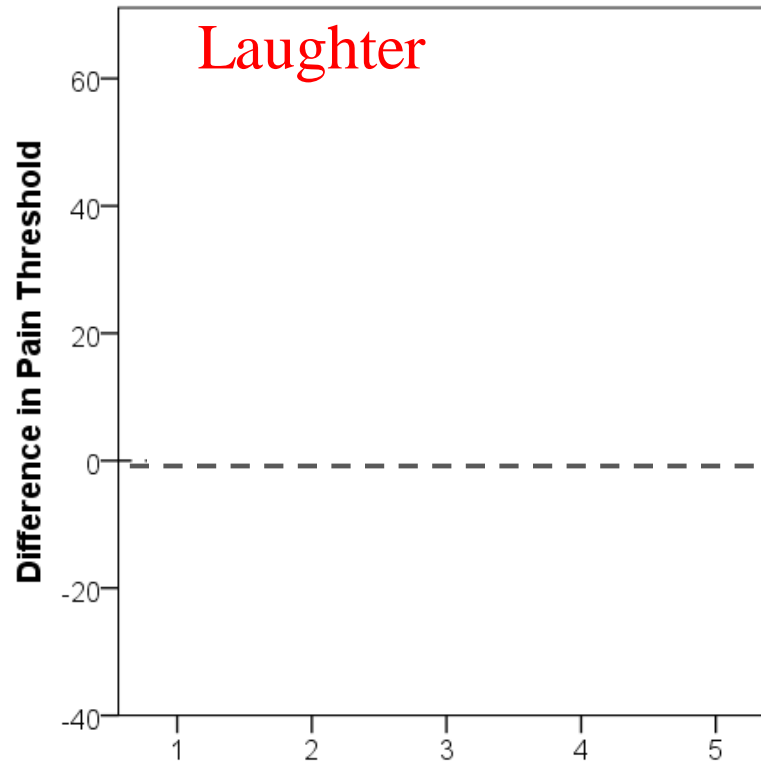


Laughter
a cross-cultural trait
shared with chimpanzees

Laughter Triggers an Endorphin Response



Endorphin receptors in brain firing up during laughter



Procedure:

- pain test
 - video/activity
 - pain re-test

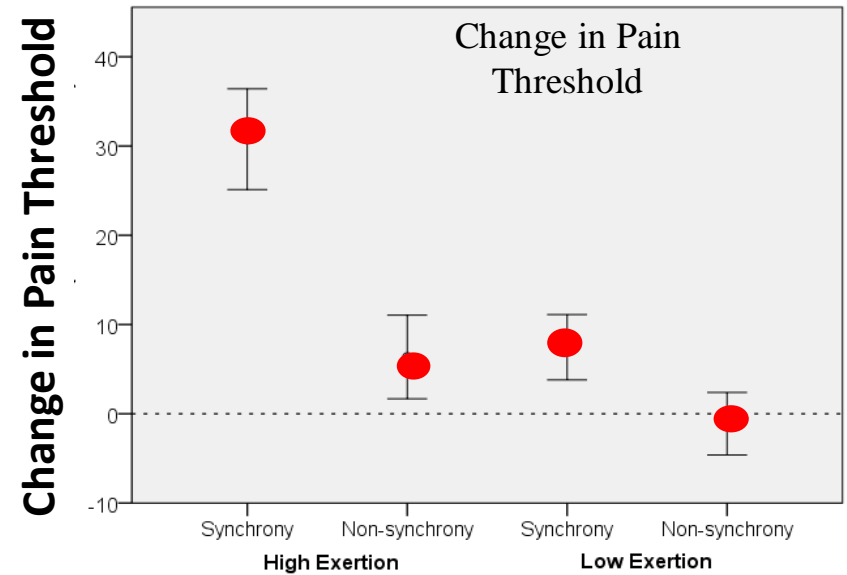


Experiment

Dunbar et al. (2012)
Manninen et al. (subm)

Something in the Way She Moves....?

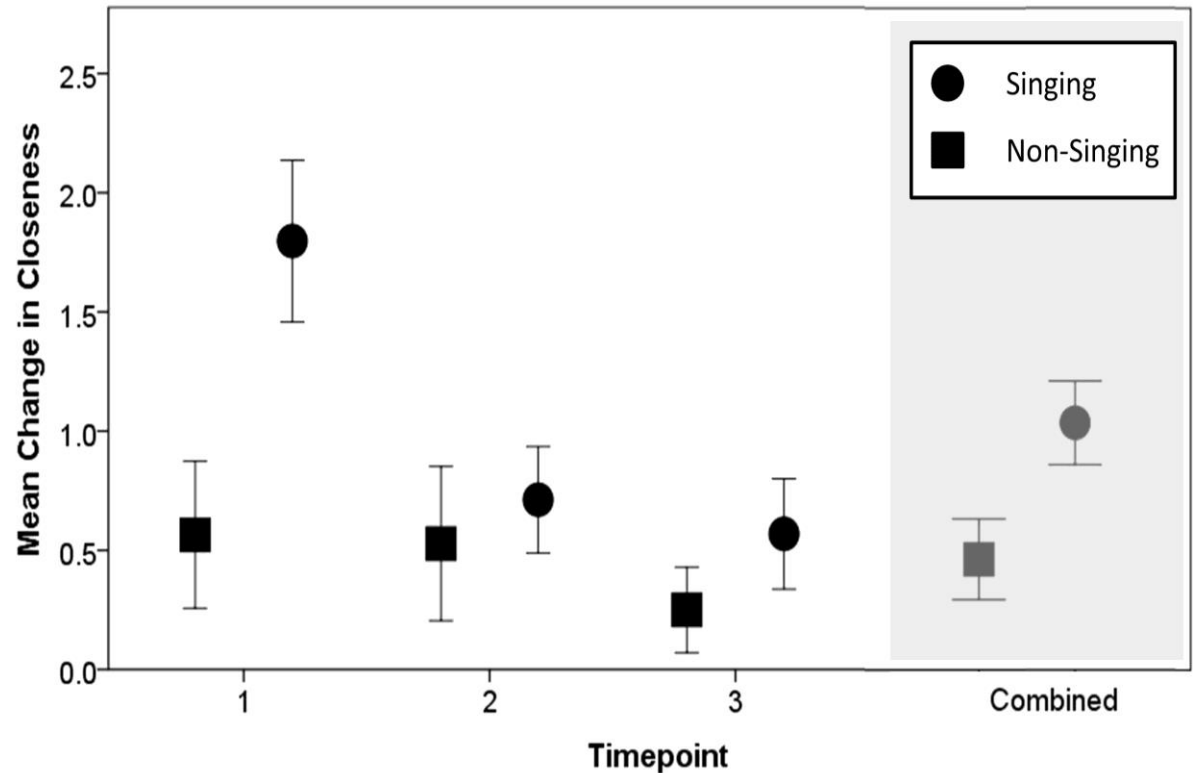
A study carried out in Brazil
with very simple dance
moves



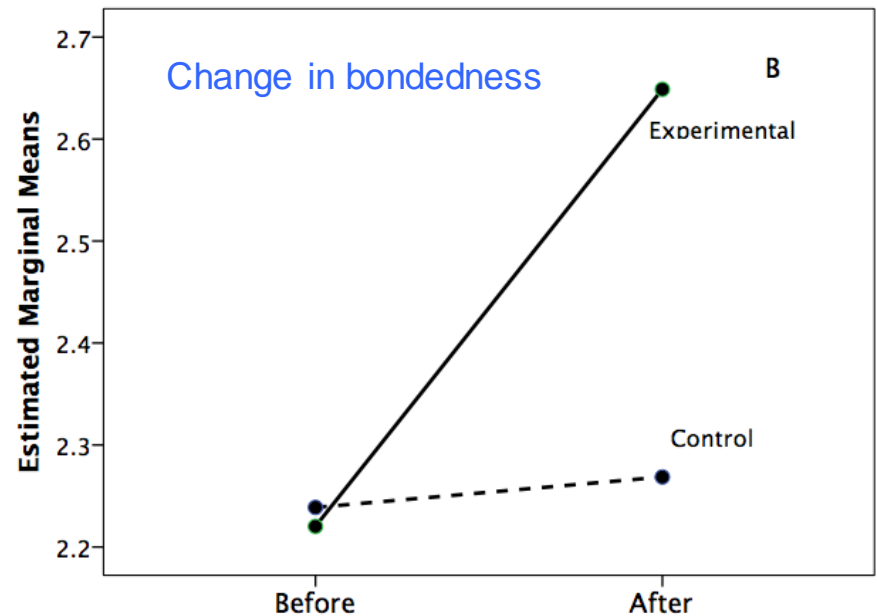
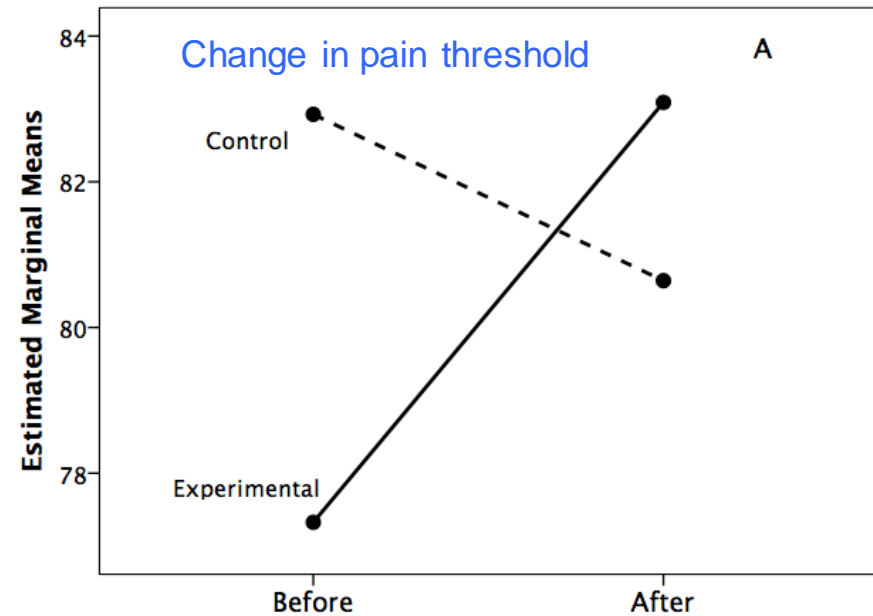
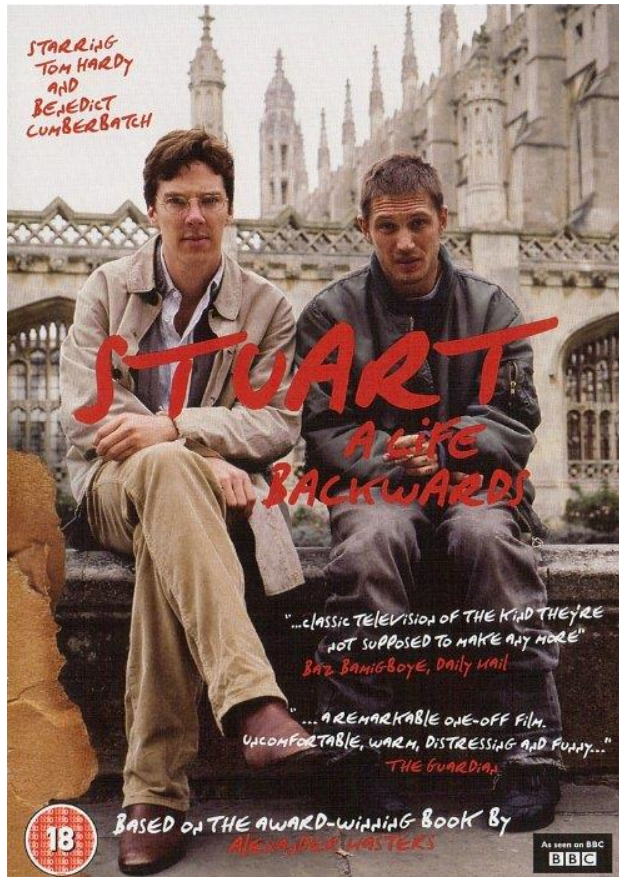
The Icebreaker Effect



- 4 singing classes vs 3 hobby classes run by WEA
- Singing produces an immediate effect of bondedness
- ...which continues



Audience Response to an Intensely Emotional Film



Two more important mechanisms for social bonding....



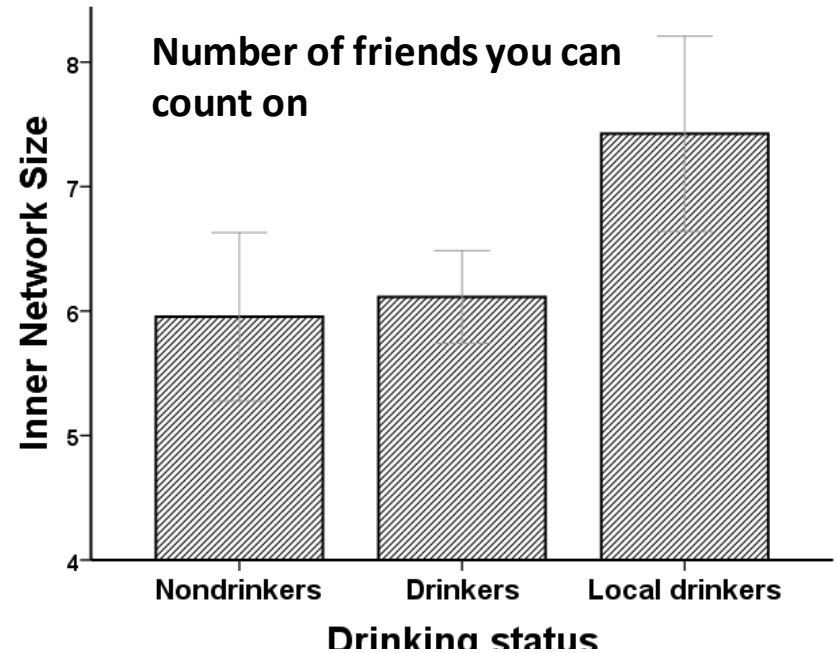
Eating and alcohol are both extremely effective triggers of endorphin activation



You cant do any of these online!

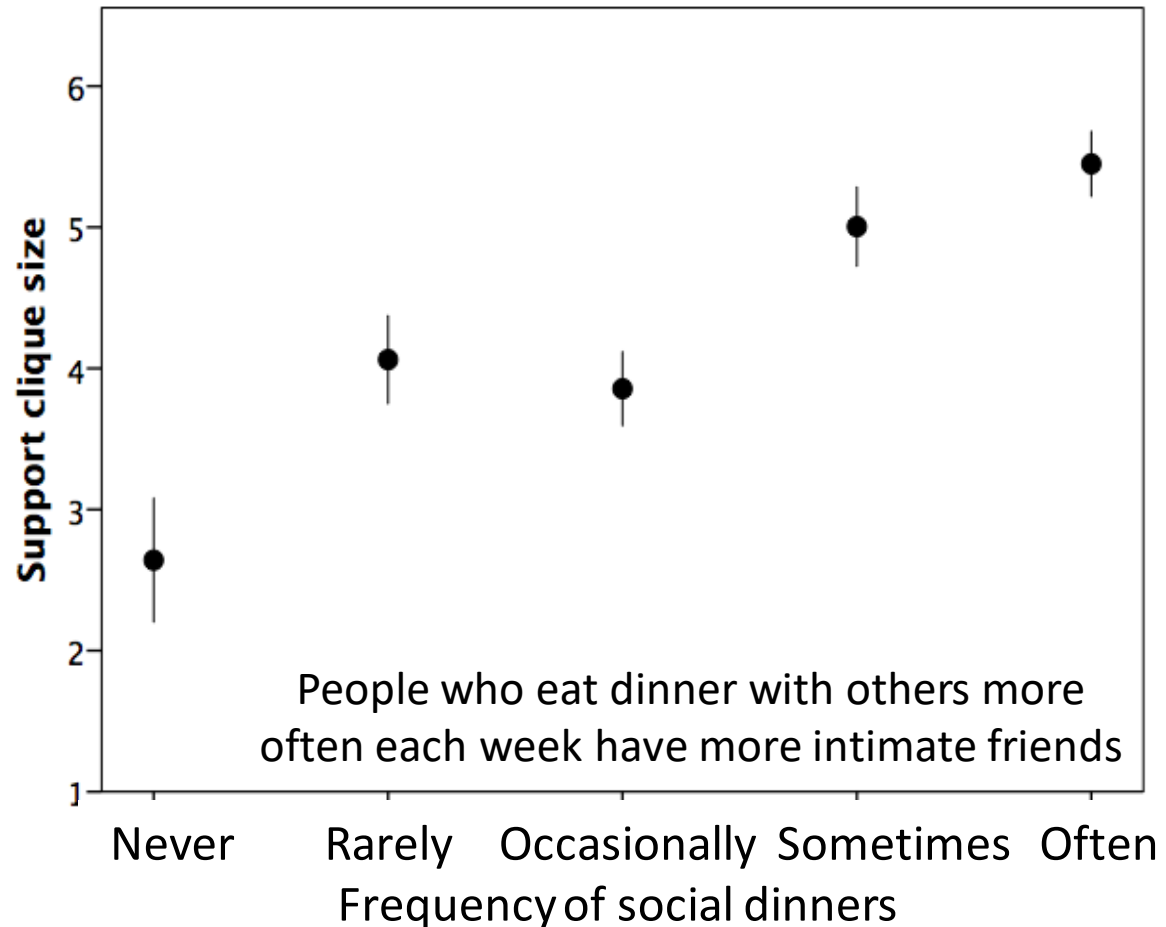
Friends on Tap?

- National survey carried out for CAMRA by YouGov
- People who have a regular 'local':
 - are happier
 - are more satisfied with life
 - feel more engaged with their local community
 - Are more trusting of those around them
 - have more close friends
 - have longer conversations
 - drink less



Why You Should Say “No” to the Sandwich on the Run?

- 2000 people sampled in UK for *The Big Lunch*
- People who eat dinners socially are:
 - Happier
 - More trusting of others
 - More engaged with local community
 - More contented with life
 - ...and more friends



The Trouble with
SCIENCE



ROBIN DUNBAR

Robin Dunbar

**The Science
of Love
and
Betrayal**



A PELICAN
INTRODUCTION

**Human
Evolution**
Robin Dunbar

a beginner's guide

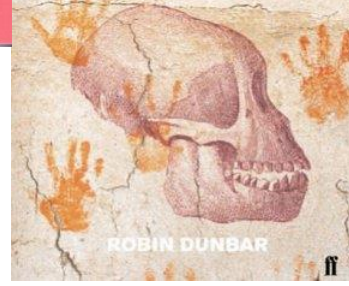


**evolutionary
psychology**

robin dunbar
louise barrett john lycett

**THE
HUMAN
STORY**

A new history of mankind's evolution



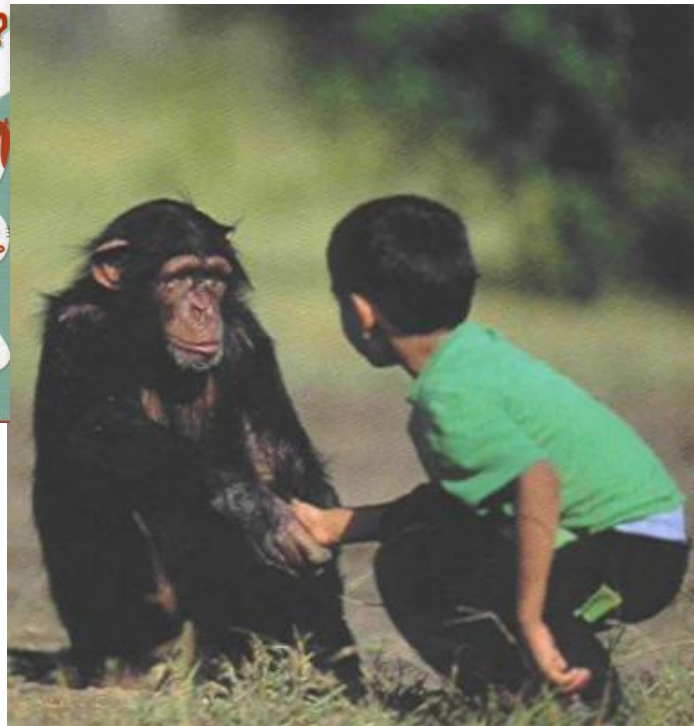
ROBIN DUNBAR

Thanks!

**HOW MANY
FRIENDS DOES
ONE PERSON NEED?**
Dunbar's Number and Other
Evolutionary Quirks

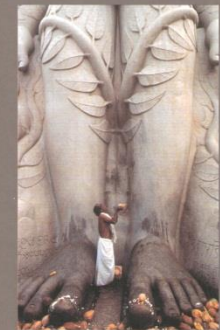


ROBIN DUNBAR



**human
evolutionary
psychology**

louise barrett, robin dunbar and john lycett



**GROOMING,
GOSSIP, AND THE**



**EVOLUTION OF
LANGUAGE**

ROBIN DUNBAR