

# The Four Elementary Forms of Social Relations

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There are many contributors to the development of the theory and the empirical studies I'll mention today, especially:

Nick Haslam (University of Melbourne)

Lotte Thomsen (Harvard University)

Marco Iacoboni & Mirella Dapretto (UCLA)

# Relational models

Generate own social action;

Understand others' action;

Remember and think about interaction;

Coordinate interaction;

Evaluate own, others', and third parties' actions;

Structure sanctions and redress;

Intrinsically meaningful and motivated.

# A Relational Model Is 'Elementary' If It Is

Universal across cultures, history, and domains.

Fundamental:

Organizes (nearly) all types of social interactions.

Irreducible to simpler component types of relationships.

Innate (cognitions, motives, emotions) and/or

Naturally emergent in social coordination.

Are there  
elementary relational models?

How many?

4





# Communal Sharing

People feel they have something essential in common,

that differentiates them from others.

Lovers, family, clan, team, platoon, community, university, profession, ethnic group, nation, human kind.

Equivalence relation;

Nominal scale.

Bonding, trust, and affection  
are mediated by two closely related peptides:  
oxytocin,  
vasopressin.

Oxytocin is released by stimulation of the cervix  
during sex  
and childbirth

And by nursing  
and is in breast milk.

Vasopressin is a key mediator of male bonding.

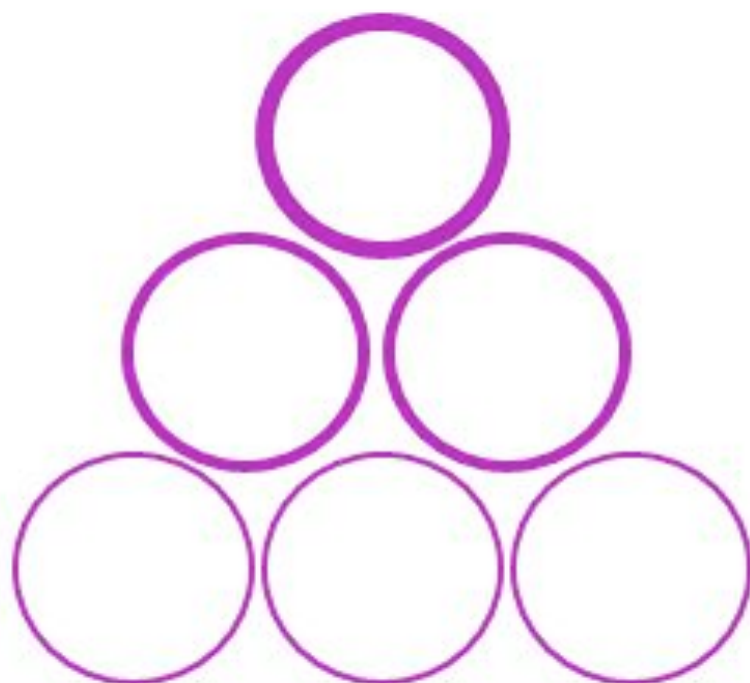
Genetically controlled distribution of AVP receptors  
in the brain determines male social pair bonding.

Other neurochemicals are also involved:

prolactin,  
dopamine,  
serotonin,  
cortisol.

CS is artificially but very strongly activated by MDMA (“ecstasy”).

Also may sometimes be mediated by unmyelinated, slow-conducting nerves that respond only to caressing.



# Authority Ranking

People are asymmetrically differentiated,  
some above others;

Those above are perceived as *legitimately*,  
naturally, necessarily entitled  
to deference and respect,

but usually are responsible to stand up for,  
speak for, and protect their subordinates.

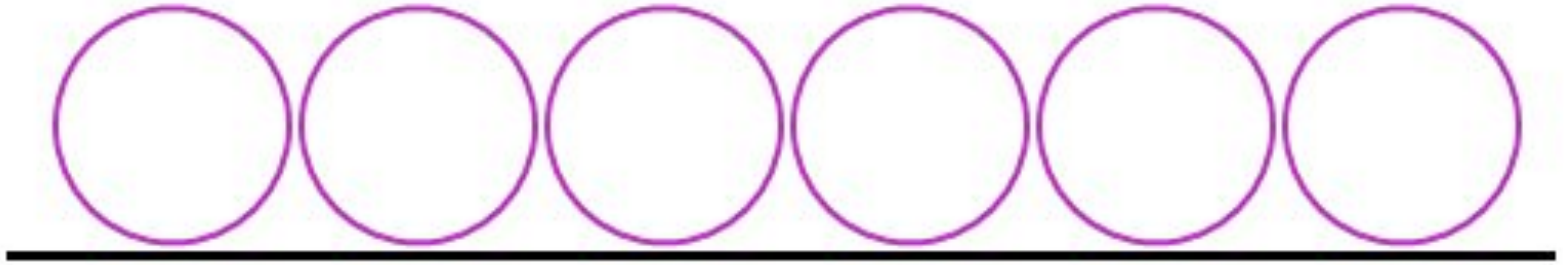
*Not mere coercive power.*

Military or organizational hierarchy, seniority,  
feudal system, filial piety, worshiping ancestors  
& gods.

Linear ordering, ordinal scale.

Mediated in part by testosterone.

Likely to have evolved by generalization of dominance hierarchy system.



# Equality Matching

People attend to additive differences with reference to even balance.

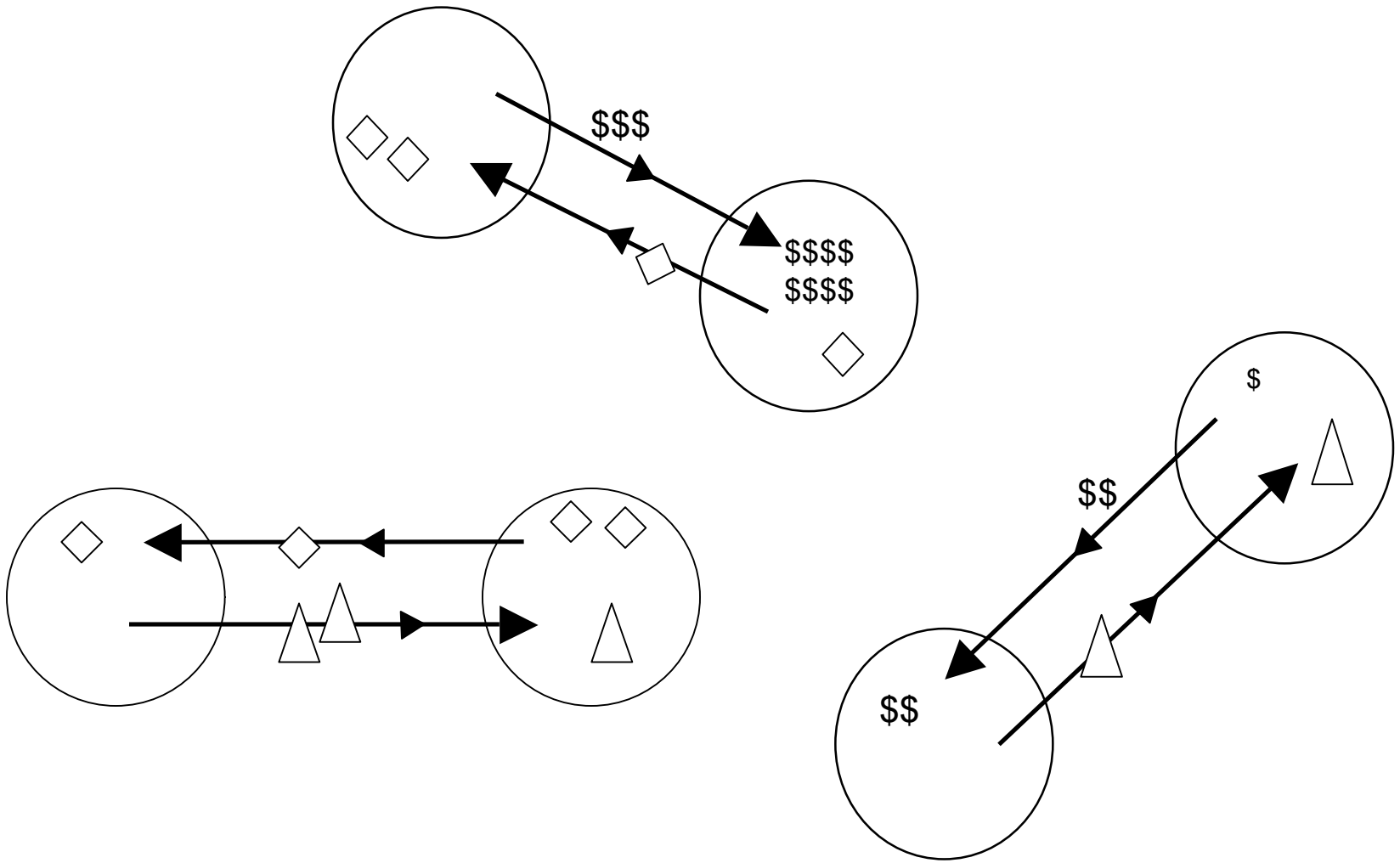
Turn-taking, tit-for-tat in-kind reciprocity, eye-for-an-eye vengeance, even distribution, equal contributions, one-person one-vote, draft lottery, rotating credit associations, most rules of most games & sports.

Ordered Abelian group

addition, additive inverse, associative & commutative;

Interval scale.





# Market Pricing

Interaction organized with reference to ratios, rates, or proportions.

Prices, wages, rents, interest, tithes, taxes;  
cost/benefit analysis, efficiency;  
expected value and utility calculus, including  
utilitarian morality;  
proportional justice (e.g., sentencing).

Not necessarily selfish, maximizing, individualistic,  
materialistic, or contractual.

Archimedean ordered field

multiplication, distributive law, every entity has a finite  
value;

Ratio scale.

CS: equivalence groups.

AR: linear hierarchy.

EM: additive differences from even balance.

MP: calculus using ratios, distributive law.

RMs approximately correspond to the four basic social science paradigms

**Functionalism:**

Focus on the bases of social solidarity.

**Political science & hegemony:**

Focus on the nature of (legitimate?) power.

**Exchange theory:**

Focus on (egalitarian) reciprocal exchange.

**Economics:**

Focus on *rational* mediation by prices.

# RMs approximately correspond to types of institution

Markets

Hierarchical firms

Clans

Partnerships??    Treaty relations??

# Guttman scale of complexity

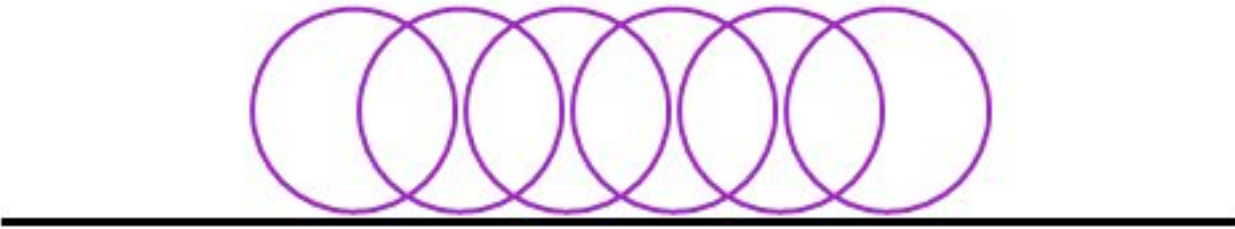
With regard to the relations and operations that are defined, that are socially meaningful:

$CS \subseteq AR$        $AR \subseteq EM$        $EM \subseteq MP$

Thus the RMs are intrinsically ordered in terms of their 'complexity.'

However, the social meanings of the relations and the social uses of the operations change, depending on the system (the RM) they are in.







The RMs are innate but mostly empty of content; they are indeterminate.

To implement them, to coordinate social interaction, a RM requires cultural complements that specify

**when,**

**with whom,**

**with regard to what, and**

**how**

the RM operates to coordinate any given aspect of any given domain of sociality.

For example, in AR, people can be ranked according to their age, gender, ethnicity, or any other personal attribute;  
education, profession, or social class;  
ritual office;  
prowess in war or sports;  
or any other kind of achievement.

Use of a playground swing can be coordinated by any RM:  
to know which model operates, children need cultural prototypes, precedents, or principles.

Suppose they know that use of the swing is governed by EM;

They still need to know  
what counts as a turn,  
who is eligible to take turns,  
who gets the first turn, etc.

So meaningful social coordination requires  
innate understanding of the logical structure  
of 4 relational models  
in conjunction with, completed by  
cultural complements that specify  
who, what, where, when, and how  
each RM operates  
in each aspect  
of each domain of sociality.

# Generativity

The indeterminacy of the RMs and their completion by cultural complements makes it possible to use them to coordinate any aspect of any kind of social interaction.

They are generative, culturally variable, and used in diverse ways to organize innumerable aspects of every domain of sociality within each culture.

Hence a small number of RMs – just 4 –  
are sufficient for nearly all human sociality.

Including the flexibility to invent  
unlimited new forms of social relations  
to adapt to changing environments  
and exploit newly created adaptive niches.

Economizes on brain volume  
and cognitive capacity,

Making it possible to be born through a human  
pelvis,

And keeps the nutritional demands of metabolically  
hungry brain tissue limited to sustainable levels.

These four elementary relational models organize most aspects of social relations in virtually all domains of sociality in all cultures.

Decision making.

Transactions

distribution,  
contributions,  
exchange.

Work.

Moral judgments & emotions.

Sanctions and redress.

Political ideologies.

Meanings of

time,

objects,

places.

Social influence.

Bases for constituting groups.

Social identities.

Forms of sexual relations and marriage.

Social aggression & violence.



# Why Four?

Why not 7 RMs, or 77?

Why *these* four?

Are these four RMs the 'best' ways of organizing social interactions, in some functional, adaptive sense that would result in natural selection of the genome or cultural practices?

Are they forms of coordination that tend to emerge to organize interaction in any domain?

If so, why?

# What Makes for a Good Coordination Structure?

The easiest to use and the most flexible, widely useful RMs would have two properties:

## **Stability or consistency:**

Relations and operations would remain unchanged under common transformations.

## **Simplicity:**

All elements would have the same properties.

# Uniqueness

A ratio scale is unique up to multiplication by a positive constant.

An interval scale is unique up to a linear transformation (adding any constant and multiplying by any positive number).

An ordinal scale is unique up to any monotonic transformation.

A categorical scale is unique up to any one-to-one categorical mapping.

# Homogeneity

All four relational structures are  
**homogeneous:**

All elements have the same properties.

Interval scales and discrete interval scales.

Krantz, Suppes, Luce, and other measurement mathematicians have shown that

These are the *only* relational structures that are homogeneous and unique under these transformations.



# Co-presence of two or more persons does *not* imply

A shared model that they use to generate their own action and that they expect others will—or should--use to interpret their action and respond;  
that participants use to evaluate own, others', and third parties' actions;  
that structure sanctions and redress;  
that are intrinsically meaningful and motivated.

# Supporting evidence

Ethnographic fieldwork

African village,

American and European corporations,

Australian household tasks.

Historical analyses of

Ancient Greece,

Ancient Mesopotamia.

Ethnological research.



Conceptual analyses of  
risk management,  
trust in inter-firm relationships,  
'face,'  
public policy trade-offs,  
moral reasoning, perceptions of justice,  
theory of mind,  
cognitive modularity,  
socio-cultural variation,  
social evolution of societies.

# New Explanations of Old Phenomena

For example,

Studies by McGraw and Tetlock showing that most of the “endowment effect” results from the meaning of object as tokens of social relationships:

That mug may be a memento of a relationship

Objects people received in an MP interaction are readily sold (e.g., retailer happily sells a ring purchased from a jewelry maker),

But people are very resistant to selling objects they received in a CS relationship (e.g., wedding ring).

Conversely, people will **pay** a high premium to buy objects that signify a CS relationship (e.g., finding your mother’s long lost locket in a flea market, you’ll pay a lot for it).

Those circles I showed you  
are easily understood by adults in  
Sweden and Russia.

And by adults and children in  
US,

Denmark,

hunter-farmers in remote

Ecuadorian villages, and

hunters in the most remote

settlement in East Greenland.

**But aberrant or deficient understandings of relational models are related to:**

**Specific personality disorders.**

**Vulnerability to depression, bipolar disorder, and schizophrenia.**

**Social functioning of schizophrenics in treatment.**

# Effect of 'Incorrect' CIRCA Interpretation on Psychological Distress

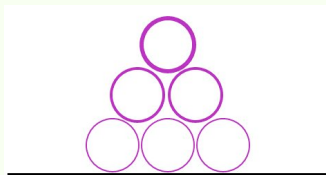
UCLA sample,  $N = 65$

DASS42

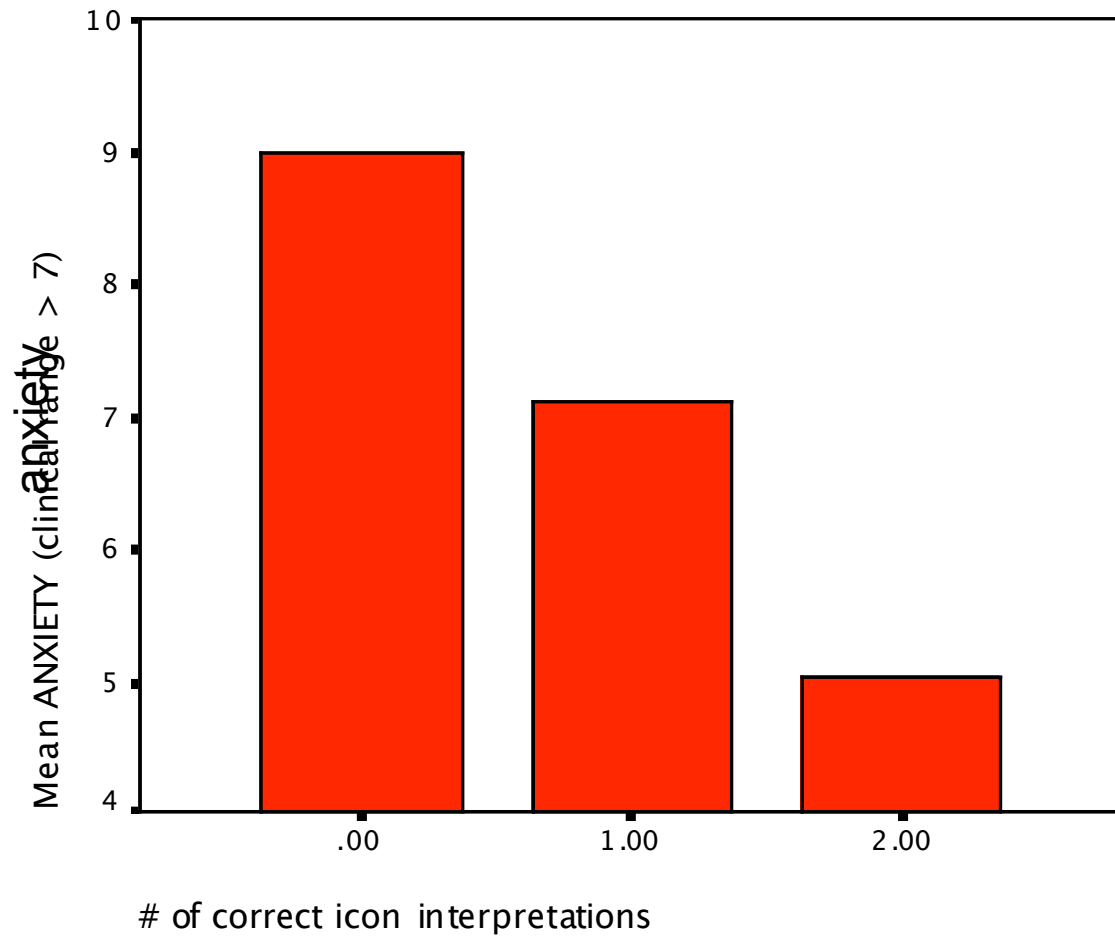
depression

anxiety (physical fear)

stress (mental)



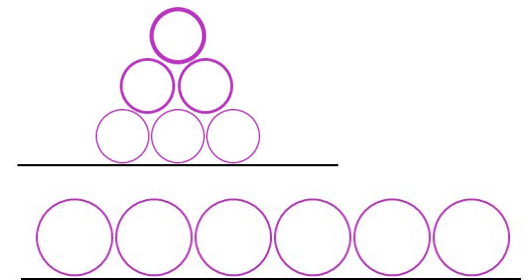
# Aberrant Interpretations = Anxiety



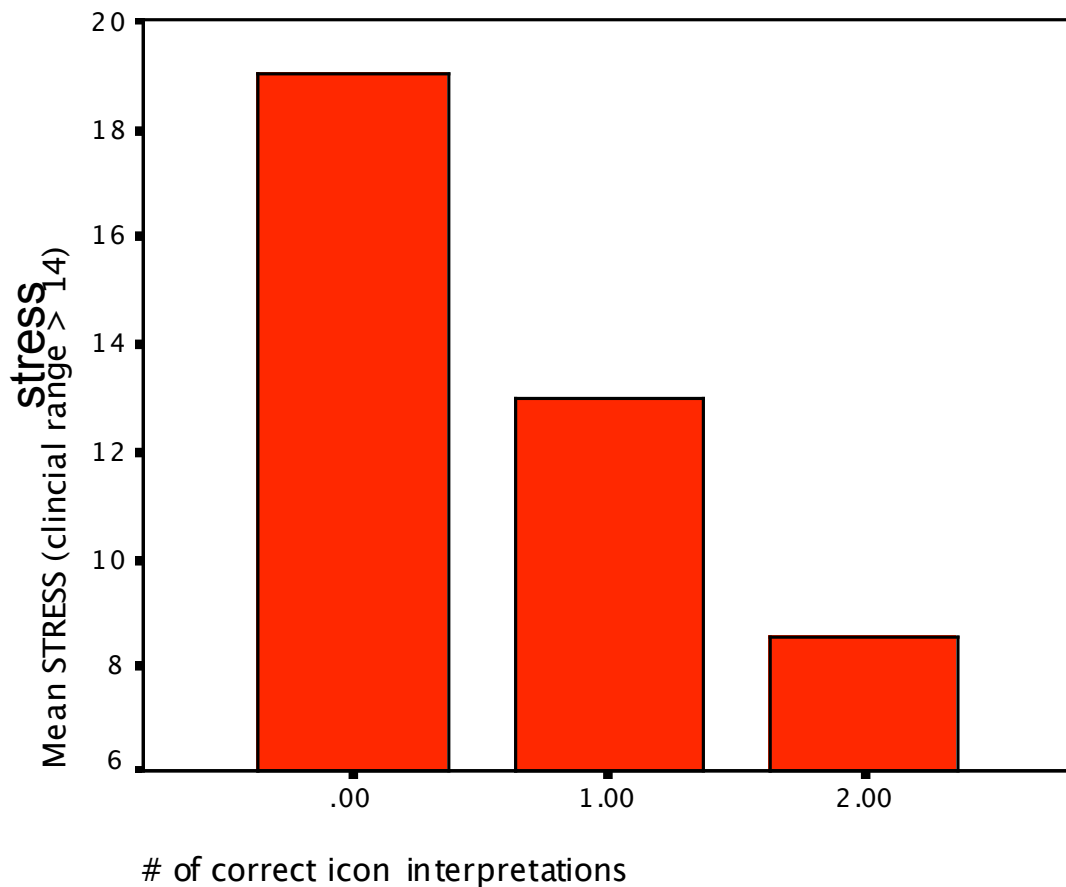
linear contrast

$$p = .06$$

$$\eta^2 = .09$$



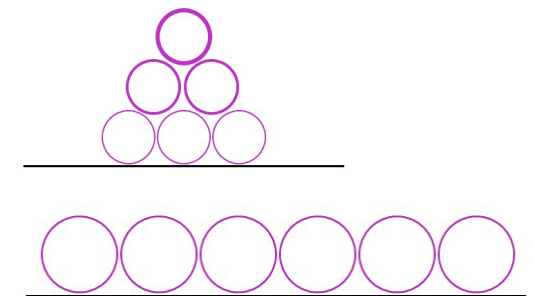
# Aberrant Interpretations = Stress



linear contrast

$$p = .002$$

$$\eta^2 = .22$$



# Effects of Divergent Implicit Assumptions About Which RM Is Being or Should be Used, or How to Use a RM:

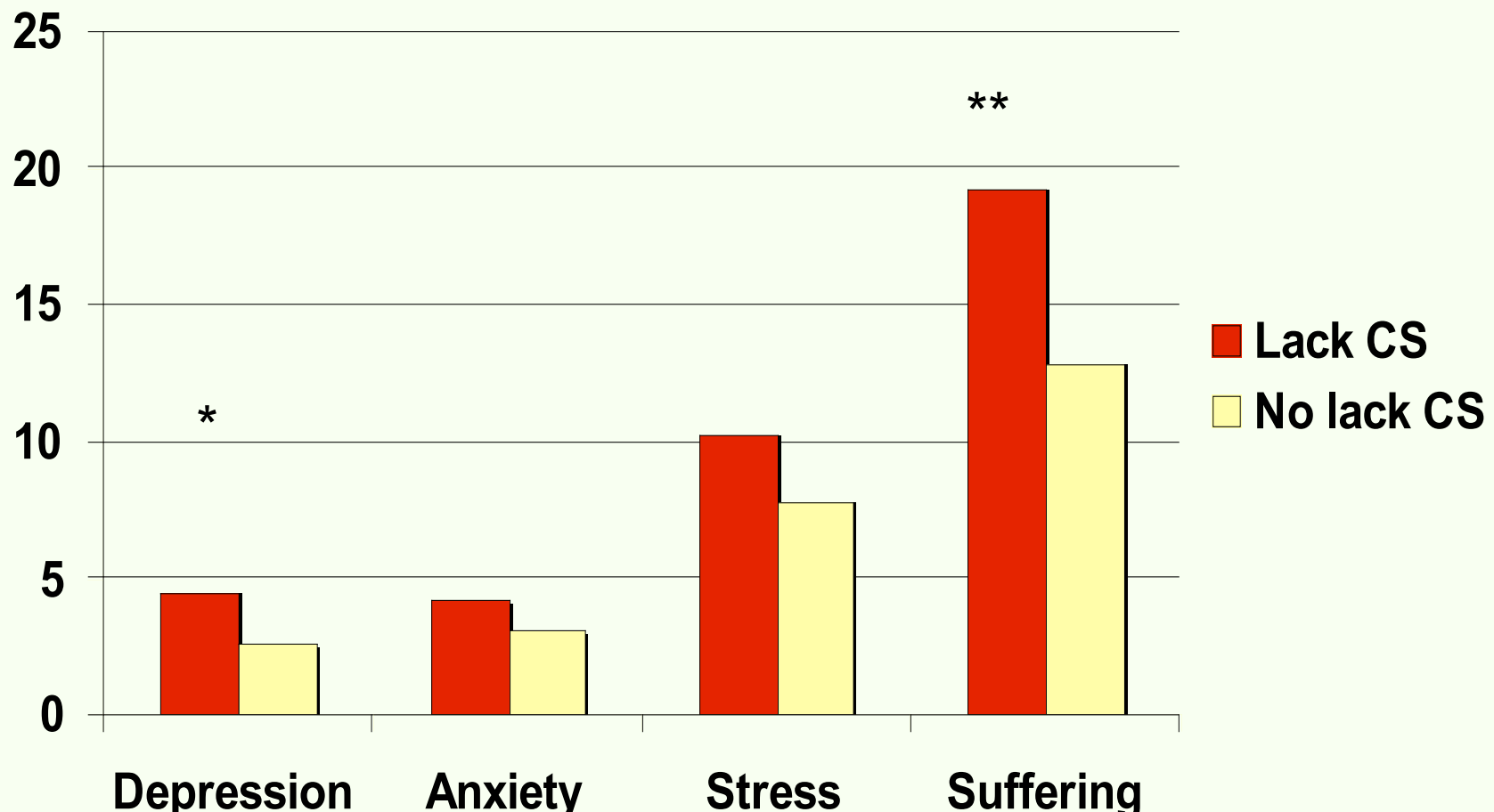
Lower satisfaction and loyalty  
and greater plans to leave  
chemistry work groups in universities.

Danes' and immigrants' negative perceptions and  
judgments of each other.

More reported symptoms  
of several psychological disorders  
and lower ratings of health.



# Perceived lack of CS predicts depressive symptoms within the “normal” range



# Ideologies and Social Attitudes

## Preference ratings of CIRCA icons

1

2

3

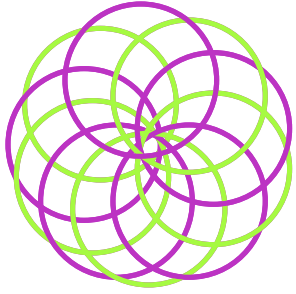
4

5

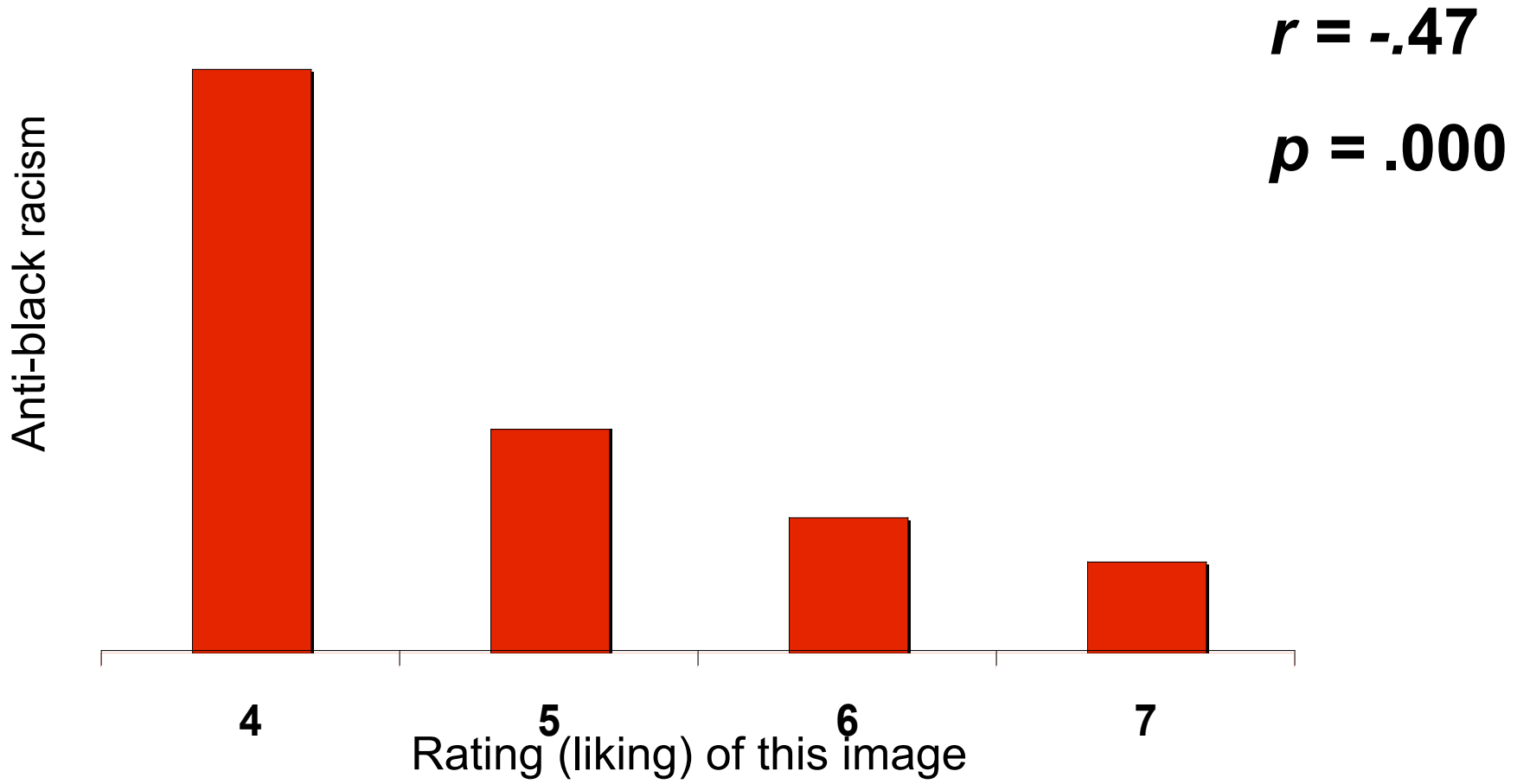
6

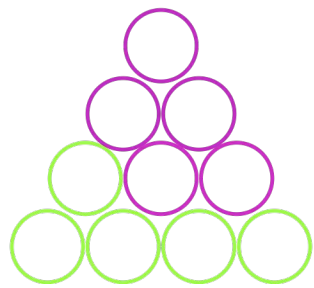
I dislike a group like this very much

I like a group like this very much



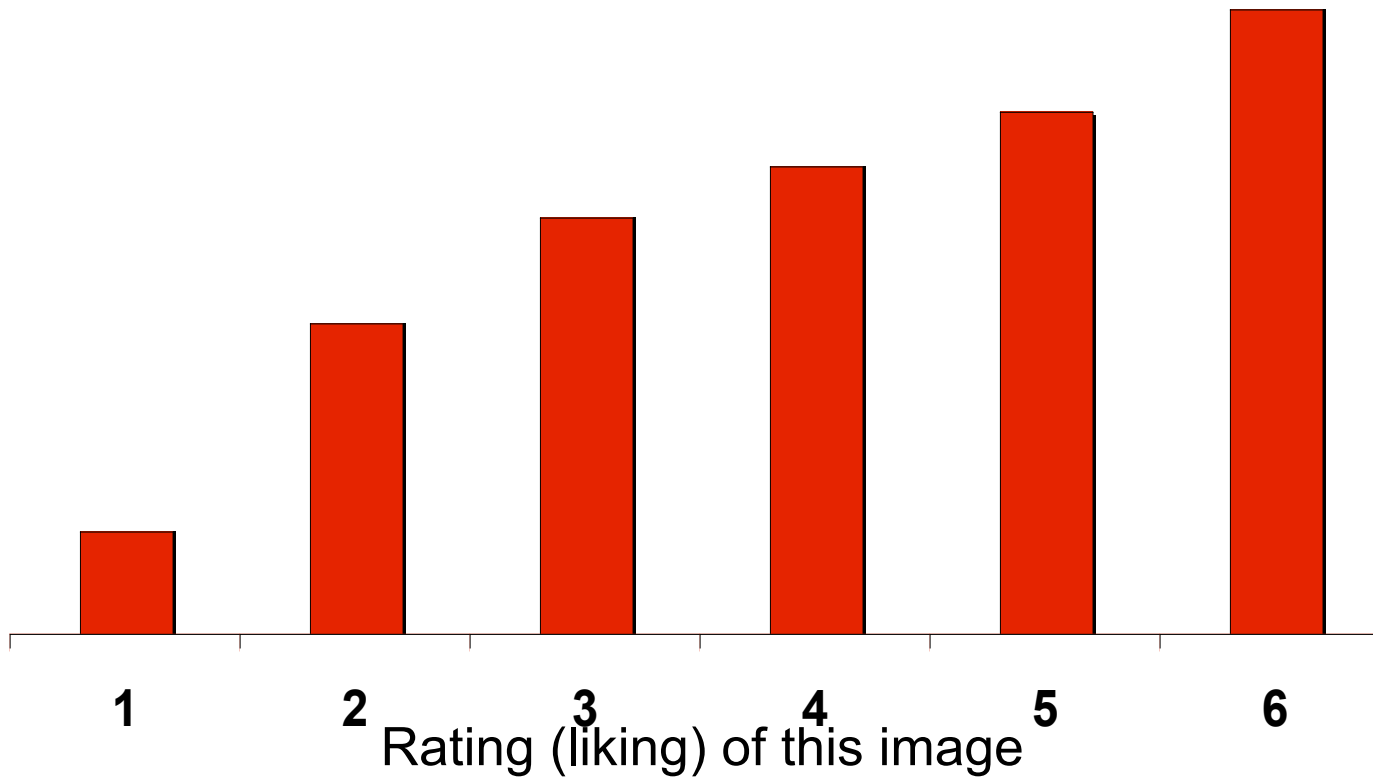
# Anti-Black Racism





Anti-Black Racism


Anti-black racism



$r = .32$

$p = .03$

# Attitudes Toward Immigration

	Prefer		Prefer 	
	<b>US</b>	<b>Swiss</b>	<b>US</b>	<b>Swiss</b>
opposition	.43***	.25*	-.43***	-.29**
change/dilution	.40***	.27*	-.35**	-.32**
tolerance	-.36**	-.21*	.28**	.32**
rule breach	.32**	.23*	-.32**	-.23*

# Political Attitudes



Welfare support	-.09	.39**
Support war in Iraq (2003)	.35*	.08

$N = 79$     \*\* $p < .01$     \* $p < .05$

## Other Studies Show that RM Preferences Are Related to:

Fear of crime,

Punitiveness,

Social dominance orientation,

Right-wing authoritarianism,

Preparedness to hunt down minorities,

Attitudes toward multi-culturalism.

# Neuro-cognitive specialization?

Is the neuro-cognitive system for social relationships the same as that used for

thinking about individual persons?

thinking about objects?

thinking about *anything* else?



# The Default System

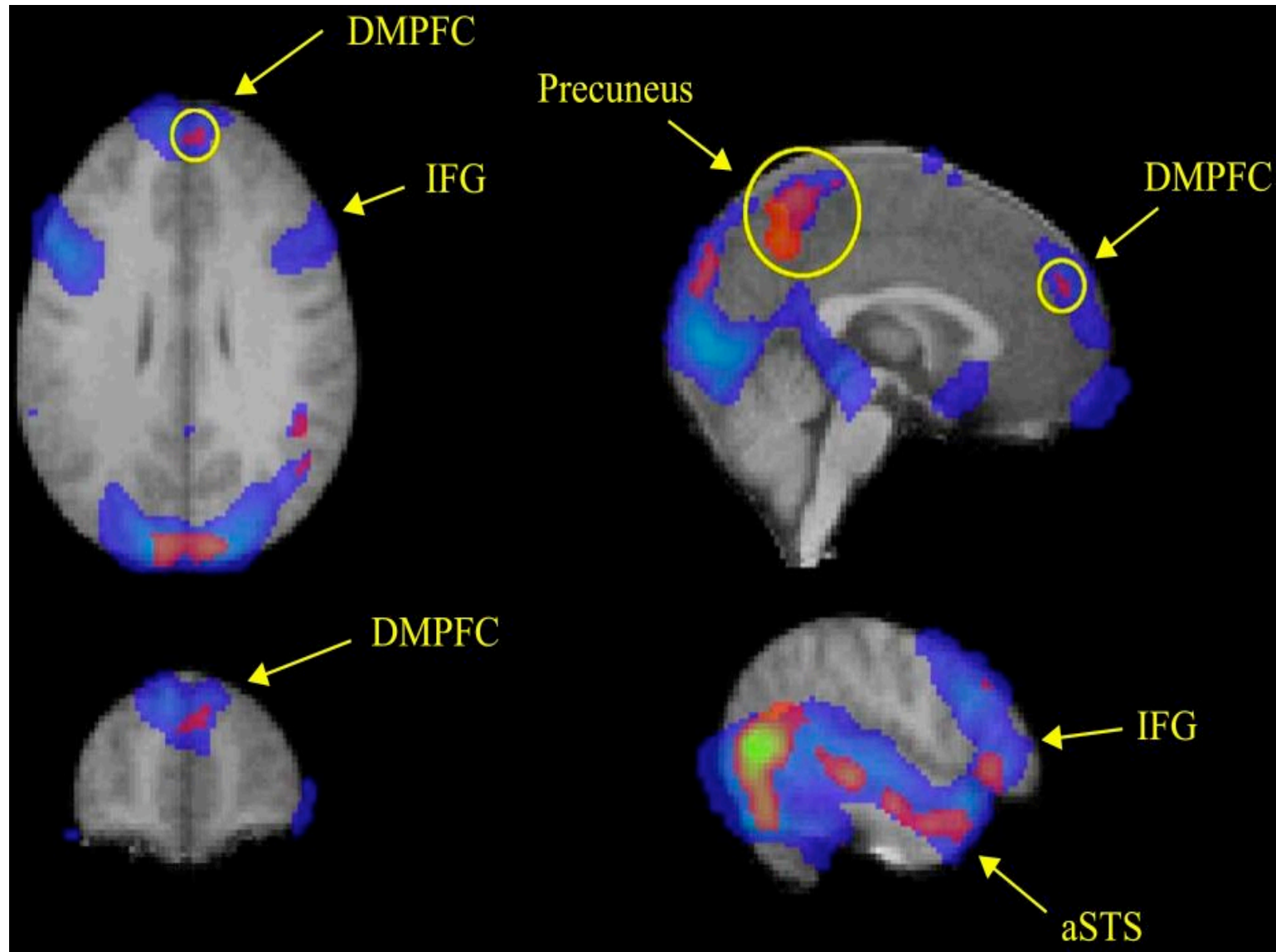
There is a set of regions in the brain that is *deactivated* by all of the thousands of cognitive tasks that have been used in neuroimaging.

This system includes

**precuneus (medial parietal cortex)**

**dorsomedial prefrontal cortex**

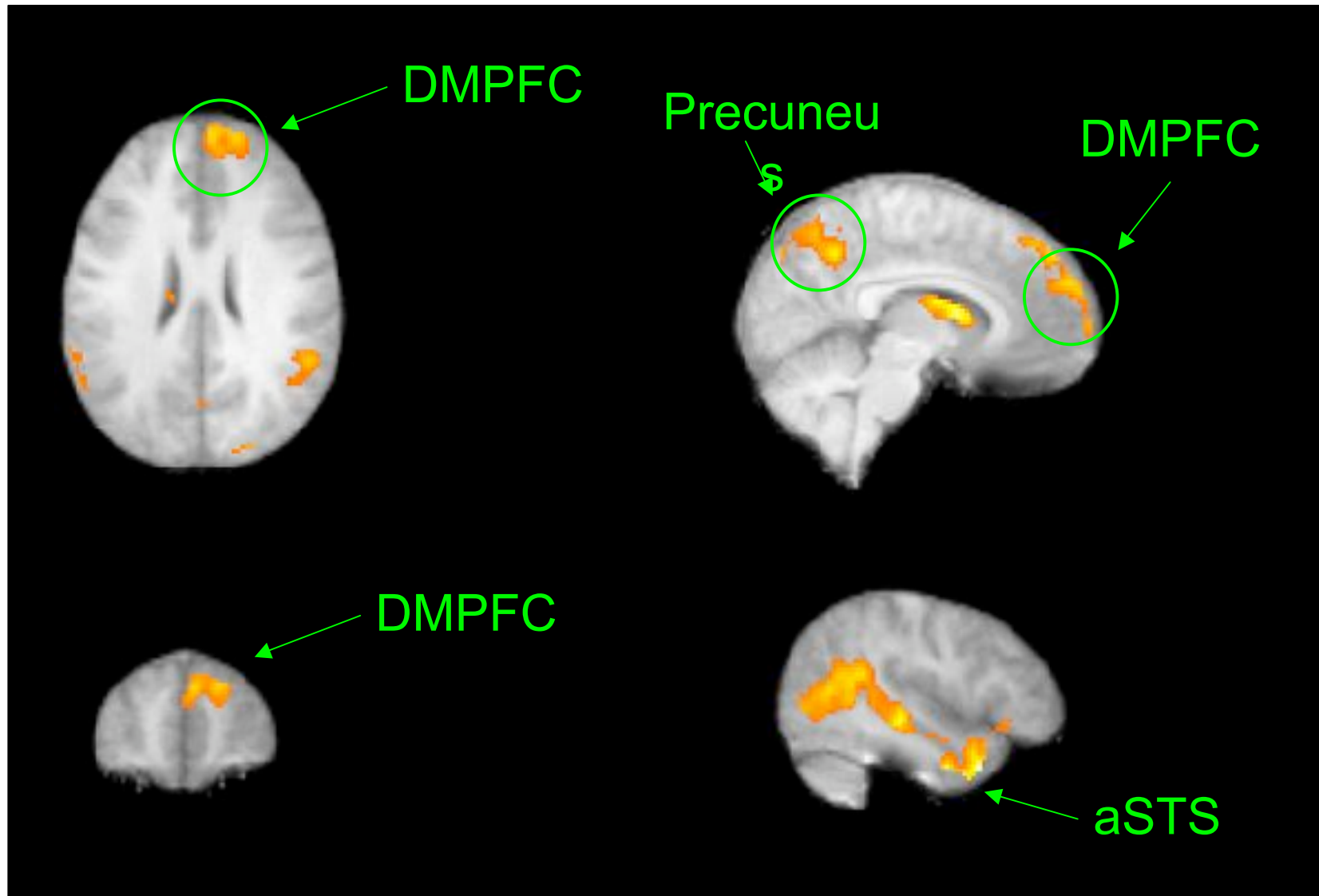
# Adults: Relational Minus Individual



Each pixel,  $p < 0.05$ , corrected for multiple spatial comparison across the whole brain.

**DMPFC** = Dorsomedial Prefrontal Cortex; **IFG** = Inferior Frontal Gyrus; **aSTS** = Anterior Superior Temporal Sulcus

# Children : Relational Minus Individual



DMPFC = Dorsomedial Prefrontal Cortex; IFG = Inferior Frontal Gyrus; aSTS = Anterior Superior Temporal Sulcus  
 $p > .005$  uncorrected for magnitude and  $.05$  corrected for spatial extent (multiple comparisons across the whole brain)

# A Brain System Dedicated to Understanding Social Relationships:

Precuneus (medial parietal cortex);

Dorsomedial prefrontal cortex;

Anterior temporal cortex:

temporal pole

superior temporal sulcus –

semantic meaning and moral emotions.

Cognition about relationships:

Recall clustering;

Prototypicality judgments;

Similarity ratings;

Naïve free sort categorizations;

Implicit cognitive categories;

Adults' and children's perception of abstract figures;

Children's understanding of movies & drawings.

Intentional substitutions of interaction partners.

Errors

# Bengali Error Substitutions

Relationship with Appropriate/Intended Recipient

	CS	AR	EM	MP	Total	
Relationship with Actual Person	CS	<b>8</b>	1	1	0	10
AR	0	<b>3</b>	2	0	5	
EM	1	2	<b>16</b>	1	20	
MP	0	1	2	<b>5</b>	8	
Total	9	7	21	6	43	

$del = .62$   $p = .00005$

# Korean Error Substitutions

Relationship with Appropriate/Intended Recipient

	CS	AR	EM	MP	Total	
Relationship with Actual Person	CS	<b>4</b>	0	0	0	4
AR	0	<b>17</b>	2	1	20	
EM	0	1	<b>8</b>	0	9	
MP	0	0	0	<b>1</b>	1	
Total	4	18	10	2	34	

$del = .80$   $p = .00005$

# Some Implications

Intrinsic, innate sociability.

Natural moralities, natural law.

Nature of rewarding, enduring relationships—

And some sources of relationship conflict.

Bases of cross-cultural misunderstanding—

And basis for potential for mutual comprehension  
across cultures.



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