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?
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:

\[ \text{CS} \subseteq \text{AR} \quad \text{AR} \subseteq \text{EM} \quad \text{EM} \subseteq \text{MP} \]

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 though 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.
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
\[ p = 0.002 \]
\[ \eta^2 = 0.22 \]
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

![Bar chart showing the comparison of depression, anxiety, stress, and suffering between lack of CS and no lack of CS. The chart indicates a significant difference in suffering with Lack CS compared to No lack CS.](image-url)
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

Rating (liking) of this image

Anti-black racism

$r = -0.47$

$p = 0.000$
Anti-black racism

Rating (liking) of this image

1 2 3 4 5 6

$r = .32$
$p = .03$
### Attitudes Toward Immigration

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<td>Support war in Iraq (2003)</td>
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$N = 79 \quad **p < .01 \quad *p < .05$
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

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<th>AR</th>
<th>EM</th>
<th>MP</th>
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\[
del = .62 \quad p = .00005
\]
## Korean Error Substitutions

Relationship with Appropriate/Intended Recipient

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</table>

\[ del = .80 \quad p = .00005 \]
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.
rmt.ucla.edu