



Center for Research on
Environmental Decisions

The effects of social context on environmental decisions

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IDDRI Seminar: 4 June 2010

Overview:

Four effects of social context

- A brief sketch of **CRED**
- Goals and plans: A framework for decision theory
- Social context
 - promotes *adoption* and *activation* of **social** and **environmental** goals
 - gives rise to *expectations* about others → **coordination**
 - sometimes enhances learning and use of scientific information
 - “energizes” behavior (for better or worse)
- Applications to sustainability
 - decision architecture for individual decision makers
 - architecture for group/political decisions
 - architecture of economic analysis

how CRED started on the problem of group decision making

- improved understanding of individual choice
 - the Tversky-Kahneman revolution
 - heuristics & biases
 - Prospect theory
 - emerging field of behavioral economics
- environmental social science
 - field work on utilization of climate forecasts (IRI for C&S)
 - economics and politics of restricting CO₂ emissions
- We recognized that environmental choices are made
 - by groups
 - or by individuals in group context (“dilemma of the commons”)
- CRED research team
 - people who enjoy working across disciplines
 - seeks interplay of laboratory and field research

origins, 2003-2009

people *disciplines* institutions

research collaborators

Abdelrahim Accordino Akkar Alexander Almeida Alves
Aoyagi-Usui Appelt Aracena Arora Baker Balstad Bert
Bhada Bolson Briones Broad Buturovic Cimino Colvin
Commiso Cox Dixon Durston Epstein Fang Fay Fonseca
Former Frost Fudenberg Garcia Gellers Gil Goffe Gondek-
Brown GonzalezG GonzalezX Gorka Gorokhovich
Graniello Grote Groves Guzman Hammer Handgraaf
Hangartner Hansen Hardisty Hart Heal Heatherington
Hidalgo Higgins Hudson Izraelit Johnson Johnston Jurt
Kabugo Kagan Kim Kishel Kong Krantz Krosch Kunreuther
Laciana Lall Leighton Leiserowitz Levine Linneweber
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SmithJ Sosler Sparks Spirito Sprague Steketee Stuermer
Suarez Suh Taddei Thompson Thomson Toranzo Velez
Waiswa Weber Wedin Weinberg Weinkle Weitlauf
Yoskowitz Zachary

anthropology
ecology
economics
engineering
environmental sci.
geography
geoscience
history
management
meteorology
psychology
public admin.

advice & support

Brewer Brown Cane Cohen Cullen
Easterling Goddard Hansen Johnson
Kushnir Lackner McCay Meyer
O'Connor Pfirman Sachs Schubert
Ting Yarmus Yates Zebiak

a **host** of supportive undergraduates,
graduate students, colleagues in other
departments, friends, and family

NSF (institution and individuals)

Columbia units

Earth Institute
ISERP
IRI
LDEO
Climate Center
Psychology Dept.
School of Business
Dept. Earth Environ. Sci.
Dept. Earth Environ. Eng.
Dept. E³ Biology
CIESIN

Others

Bard College
Decision Research Inc.
Duke U.
Pennsylvania State U.
U. Calif., Davis
U. Georgia
U. Miami
U. Pittsburgh
Wharton School
Yale U.

“CRED 2”: 2010 and forward

- renewal of NSF support assured
 - social context
 - decision architecture
 - scientific communication
- central role in Columbia’s Earth Institute
 - gratifying but unfortunate – much more social science involvement is needed
- seeking new leadership from within and outside
 - I am 71 years old and I plan a much reduced role by 2014 – transition is in progress
- seeking new partnerships
- seeking much stronger relationships with field partners; movement toward participatory research design

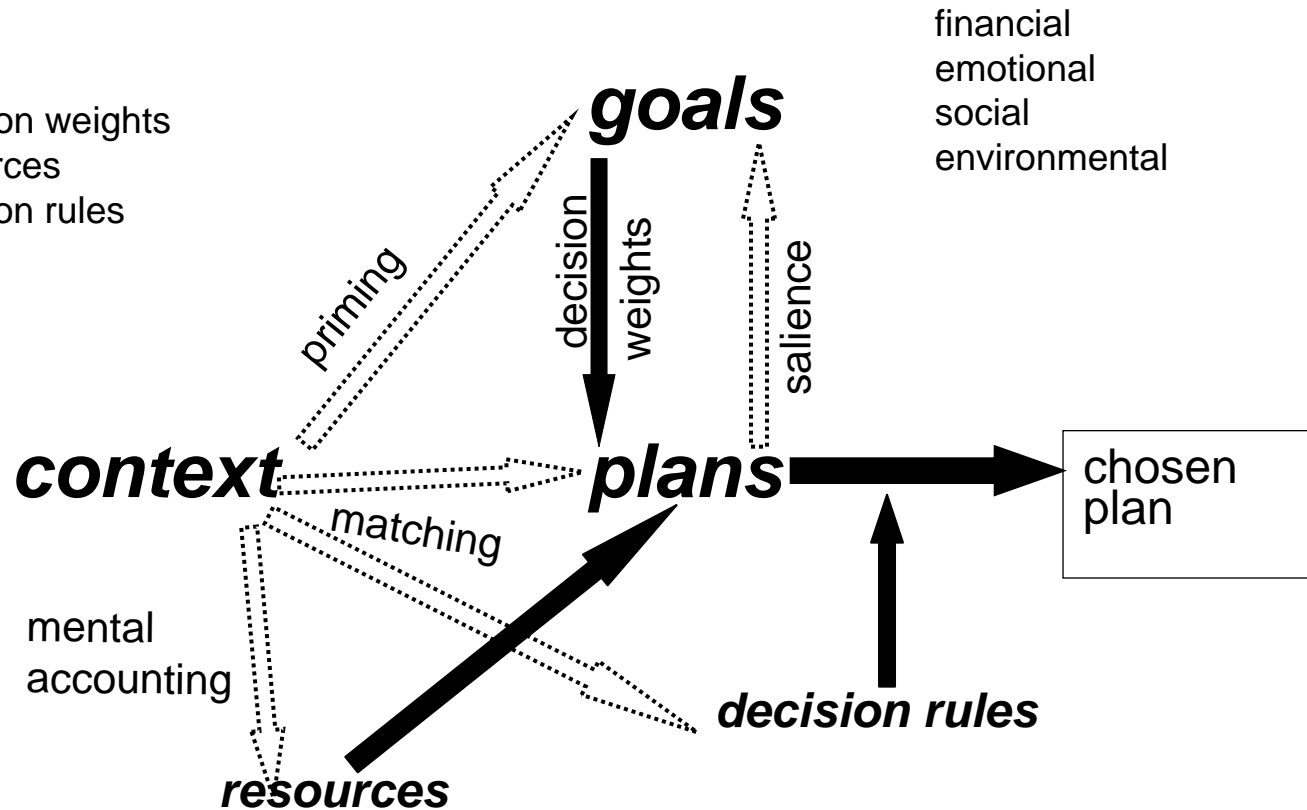
A schema for constructed choice

dashed arrows show context effects

from Krantz & Kunreuther (2007)

Time horizon effects:

- on goals
- on plans
- on decision weights
- on resources
- on decision rules



Affiliation, social goals, and social identity

- affiliation as a basic human motive (Schachter)
- multiple affiliations: a distinctive characteristic of *homo sapiens*
 - transient, medium-term, long term, transgenerational
 - concrete or abstract
 - personal, professional, avocational; local / regional / national / global
 - affiliations with mythic or semi-mythic persons or groups
- multiple goals related to any *one* affiliation:
 - goals related to the affiliation *per se* (including **self-identity**)
 - **role** aspirations and **status** aspirations
 - role- and status-induced **obligations**
 - goals pertaining to **others** (in- or out-group)
- internalized social identity
 - covers many environmental goals
 - **moral standards** as goals

Goals related to affiliation *per se* (elaboration)

- taking on group identity
- taking on group status
- enhancing group status
- safety: feeling (and being) secure
- efficacy: feeling (and being) capable or powerful
- adherence to group norms
- sharing with other group members
 - mere presence
 - activities or experiences
 - vary with group: meals, prayer, sex, conversation, projects

Obligations related to role and/or to status (elaboration)

- professional standards: the core of civil society
- setting and / or enforcing group norms
- service obligations
- relations with parallel or umbrella groups
- charitable donations

Effects of social context on goals

- **activation** of goals
- **re-weighting** goals (often a consequence of group process)
- **adopting** new goals (often a rapid, insight-driven process)
 - racial equality in the USA
- **abandonment** of goals (often a slow and painful process)
- laboratory research on group decision making
 - differences in goals that emerge in group discussion between “naïve” and “pre-decided groups
- vast lore relating to leadership, mediation of conflict, etc.

Applications: Social goals and sustainability

- **(1) Nash equilibria:** “payoff matrix” is altered by social and environmental goals
- **(2) Reciprocity theory:** intrinsic goal to reciprocate → intrinsic reward
- **(3) Analytic architecture for economics:** effects of delay (also effects of uncertainty) vary with type of goal

Change in payoff for social goals: commons dilemmas

Player 1 & Player 2 each choose a strategy:

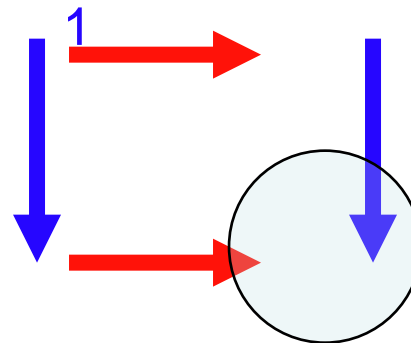
C(cooperate) *or* **D**(defect)

outcomes for each combination of strategies ranked 1 (low) to 4 (high)

Player 2 strategies

C **D**

Player 1 strategies	C	D	
C	3	4	1
D	4	2	2



equilibrium:
(**C**, **C**) is better but
only (**D**, **D**) is stable

Why do some cooperate?

- “type of person who cooperates”
 - not if one knows or expects other to defect
- “hope other person will also cooperate”
 - implies added benefit if this is achieved
 - (social goal since it concerns **group** outcome)
- “don’t want to be the bad guy”
 - internalized **social norm**

Commons dilemma: Reward for C, penalty for D

Player 1 & Player 2 each choose a strategy:

C(cooperate) *or* **D**(defect)

adding rewards if both cooperate, penalties for one defector

Player 2 strategies

C **D**

Player 1 **C**
strategies **3**

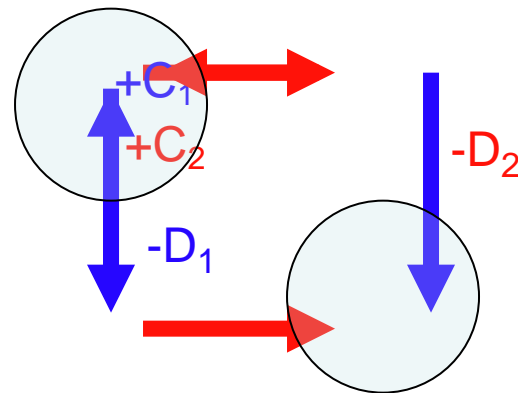
D 4

1 **2**

3 1

4

2



equilibrium:

(C,C) is better;

(C,C) and (D,D)

are *both* stable

Rewards and penalties in commons dilemma

- rewards C_1 , C_2 may be **social**:
 - conforming to self-concept
 - fulfilling prior agreement
 - intrinsic reward for successful joint effort
 - reciprocation goal from previous cooperation
- or long-term *economic*:
 - inducing reciprocal cooperation in future
 - establishing reputation as cooperator
- penalties $-D_1$, $-D_2$ may be **social**:
 - guilt for hurting other or for violating self/concept or agreement
 - disapproval or anger, from other or third party
- or long- or short-term *economic*:
 - inducing reciprocal defection, hurting reputation
 - explicit fines or penalties
- **in- and out-group relations affect knowledge of norms and expectations of others**

Lab studies of commons dilemma

- There have been many
- One of our contributions is to show that contexts that increase strength of affiliation with the (transient laboratory) group also increase cooperation
 - increase in social rewards for successful group action
 - increase in social penalties – guilt for failure to reciprocate
 - change in expectations that others will cooperate: **social projection** mechanism
- Design of enforcement should take implicit rewards and social penalties into account (this may often be done unconsciously)

Analytic architecture for economics

- simple utility equation: represent effects of uncertainty and delay by multiplicative factors that downgrade multi-attribute utility

$$U(\$, C) * w(p) * h(t)$$

for temporal streams, assume additivity over time

different goals may behave in distinct ways with respect to uncertainty and delay:

$$U(\$) w_{\$}(p) h_{\$}(t) + U(C) w_C(p) h_C(t)$$

some goals may be achieved once, not consumed over time, and therefore not discounted except for delay in achieving them (e.g., many social goals; inter- or trans-generational goals)

Additional effects of social goals

- promotes ***adoption*** and ***activation*** of **social** and **environmental** goals – Covered
- gives rise to ***expectations*** about others → **coordination** – Covered
- sometimes enhances learning and use of scientific information
- “energizes” behavior (for better or worse)

participatory processes: field and lab studies

group processes established by custom, law, or fiat



established by custom:
a “listening group” in Uganda
(discussing meaning and implications
of seasonal climate forecast)



established by fiat:
a “Water Allocation Seminar”
in Ceará (northeast Brazil)
(implication of seasonal forecast
for water release from reservoirs)

questions (and some answers) regarding participatory processes

- What does participation accomplish?
 - legitimation? empowerment? Are they real? How do they work?
 - We focus on two other benefits:
 - better **understanding** of scientific information in group context
 - extensive anecdotal evidence from field
 - validation from studies of farmer seminars (Burkina Faso)
 - laboratory studies: learning about expected value in group context
 - more **energy** devoted to implementing solutions after group discussion
 - lab studies show group efficiency enhanced by **regulatory fit**
 - validation from studies of listening groups (Uganda)
- What problems are encountered? (evidence from Ceara)
 - Uncertainty of information is sometimes used to manipulate discussions.
 - Social, economic, or political differences among subgroups sometimes engender power struggles.
 - Non-project-related social goals sometimes dominate discussions.

design of communication channels and participatory processes

- group facilitation of learning
 - allow extensive interaction among participants
 - provide conceptual support
 - provide hands-on simulation
- regulatory fit
 - avoid top-down imposition of strategies
 - understand the chronic regulatory foci of participants and use it to frame scientific information and outsider inputs
 - consider apathy as a sign of lack of fit
- multiple affiliations, multiple goals
 - bring them to surface
- adaptive management: **test** the process or channel with view to **revision**

applications summary: mitigation of and adaptation to climate change (and other environmental decision problems)

- promoting cooperation
 - Understand how equilibria are affected by affiliations & social goals.
 - Regulatory fit: focus on both obligations and opportunities.
- design of communication channels and participatory processes
 - Allow extensive participation. (Unfortunately this needs saying!)
 - Take account of multiple affiliations, multiple goals.
 - Test!
- benefit/cost analysis for multiple and long-term goals
 - Economic analysis should rest on ethnography.
 - Consider novel discounting models.