Reciprocity and Asymmetry

Sonja Vogt

Vincent Buskens, Werner Raub, Jeroen Weesie

Interuniversity Center for Social Theory and Methodology, Utrecht University
Institute for Empirical Research in Economics, University of Zurich

Rational Choice Sociology: Theory and Empirical Applications, Workshop at Venice International University
2009

Background

ciprocity

ong tradition of theoretical studies in different social sciences (Mauss 1968, Trivers 197
riedmann 1977, Axelrod 1984).

eciprocity is a fundamental behavioral pattern of returning favors and retaliating for loss
Gouldner 1960).

irect reciprocity: subjects cooperate more in two-person interactions if future interaction
re likely (Andreoni and Miller 1993, Keser and van Winden 2000, Gächter and Falk 200
uskens et al. 2009).

trong reciprocity: subjects reward those who cooperate and punish those who defect ev
they gain no individual benefit from doing so (Fehr et al. 2002, Fehr and Fischbacher
003, Fehr and Fischbacher 2004, Diekmann 2004).

lot of evidence on direct reciprocity, strong reciprocity, and indirect reciprocity in setting
ith symmetric agents.

ciprocity when people differ

reciprocity is deeply embedded in many daily interactions, then it is an empirical fact th
most cases reciprocity takes place between asymmetric agents (agents differ in interes
sources, etc.).

Vhat does reciprocity actually mean when people differ?

ntil now reciprocity typically studied in behavioral terms: agents reciprocate the behavio
e partner (tit-for-tat, tit-for-two-tat, etc.).

is not known if agents consider both past behavior and asymmetry when deciding whet
cooperate or help.

o address this question, we analyze reciprocity when there are potential interactions
etween past behavior and agent heterogeneity in repeated interactions.

ent heterogeneity

ndividual properties that are relevant for durable cooperative relations, actors like
ffer in these properties (Vogt et al. 2004, 2006):

- cooperation costs
- benefits from receiving support
- likelihood of being in need of support.

The framework

rable helping relationships

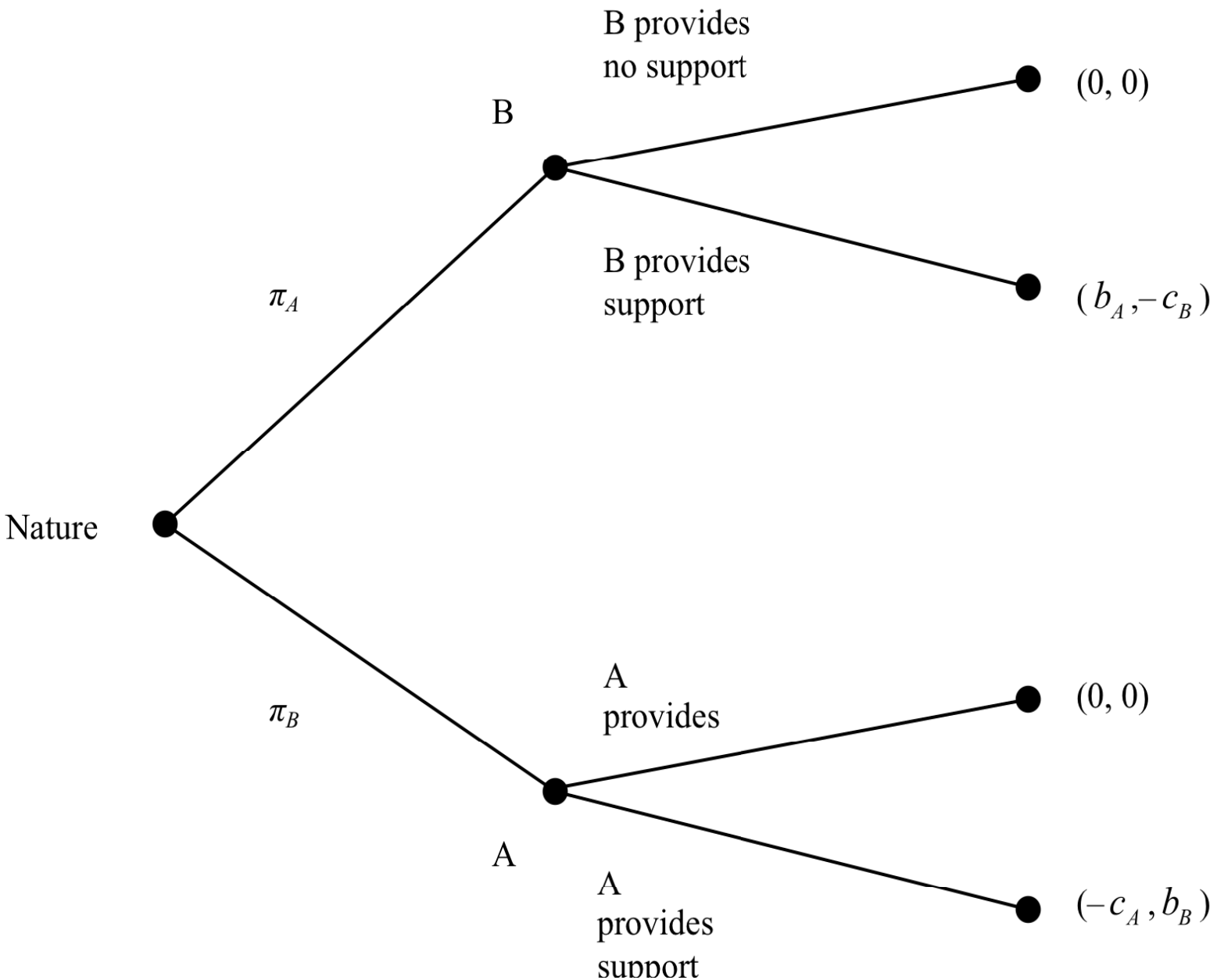
wo-agents interactions

elationships take the form of asymmetric helping games

eciprocity as backward-looking (direct reciprocity)

daptive behavior (agents mainly take past behavior into account, although forward-look
ayoff calculations are not completely neglected).

e asymmetric helping game



riation in the costs of giving and the likelihood of needing he

symmetry in the form of variation in the costs of helping and in the likelihood of being in
eed of help.

he likelihood of being in need of help taken as control.

wo approaches of the history of play: (i) the most recent interaction and (ii) the entire
story for a given pair of players.

he focal actor is the player who must make a decision to help or not in the current round
hile the partner is the player who needs help in the current round.

Hypotheses

ypotheses, partner's and focal actor's behavior (last round)

ompared to the case when the partner did not help in the last round, the focal actor is ore likely to help in the current round if the partner did help in the last round (direct eciprocity, Andreoni et al 1993, Gächter et al. 2002).

ompared to the case when the focal actor did not help in the last round, the focal actor ore likely to help in the current round if the focal actor did help in the last round (self-onsistency, Cialdini 2001, Kunda 2002).

rtner's and focal actor's asymmetric costs

partner's helping costs:

- A behavior that involves sacrifices is commonly perceived as nice behavior and consequently reveals kind intentions. A partner with high helping costs undergoes bigger sacrifice to help than a partner with small helping costs, and consequently helping when costs are high likely signals kind intentions to the focal actor (Rabin 1993, Falk and Fischbacher 2006).

focal actor's helping costs:

- An increase in the focal actor's helping costs reduces the focal actor's willingness help (Snijders 1996).

und)

Compared to the case when the partner did not help in the last round, the focal actor is more likely to help in the current round if the partner did help in the last round.

- The positive effect associated with helping by the partner increases as the helping co of the partner increase and the helping costs of the focal actor decrease.

- The negative effect associated with not helping by the partner decreases as the helpi costs of the partner increase and the helping costs of the focal actor decrease.

ypothesis, focal's behavior and asymmetric costs (last round

ompared to the case when the focal actor did not help in the last round, the focal actor ore likely to help in the current round if the focal actor did help in the last round.

The positive effect associated with helping is weaker when focal actor's helping costs high compared to when focal actor's helping costs are low.

potheses, entire history

ll hypotheses also applied to entire history of play.

he results include both approaches to the history of play (last round, entire history).

Experiment

periment

xperimental Laboratory for Sociology and Economics, Utrecht University, 2008

omputer experiment, real incentives

ubjects played (a)symmetric repeated helping games

symmetries in terms of helping costs and likelihood of needing help

ach supergame took 8 rounds, each subject played 10 supergames, random match

00 subjects (student population), average age 22, 64% women

erationalization

Label	Concept
Probability of being threatened by a loss of points	Probability of needing help
Giving away own points to overcome other's threat	Providing help (costs)
Not giving away own points to overcome other's threat	Not providing help (no costs)
Overcome threat and keeping all points	Receiving help(benefits)
Not overcoming threat and losing all points	Not receiving help (no benefit)

sign

dition	Likelihood needing help actor A	Likelihood needing help actor B	Helping cost actor A	Helping cost actor B	Benefits ac A and acto
	0.5	0.5	10	10	30
	0.5	0.5	5	15	30
	0.33	0.67	10	10	30
	0.67	0.33	5	15	30
	0.33	0.67	5	15	30

Results

sults

andom effect logistic regression.

ependent variable: providing help.

dependent variables: past behavior, interaction past behavior and asymmetric costs.

ontrol for other past and future effects: number of rounds, round seven and eight, numb
f supergame, likelihood of needing help, costs of providing help, interaction of helping
osts and likelihood of needing help.

models on last round (main effects and interaction effects), 2 models on entire past pla
ain effects and interaction effects).

	previous	previous	entire	entire
ctor provided help, *previous*	1.938***	3.394***	1.447***	1.526**
ctor did not help, *previous*		Reference category		
ctor received help, *previous*	2.852***	1.877***	2.496***	2.561**
ctor was denied help, *previous*	-0.415*	-1.713***	-0.536**	-0.496*
ctor provided help, *entire*			0.590*	0.532*
ctor did not help, *entire*		Reference category		
ctor received help, *entire*			2.220***	2.234**
ctor was denied help, *entire*			-0.689*	-0.603
elped * focal's costs, *previous*		-0.138***		-0.126**
eceived * partner's costs, p*revious*		0.104**		0.081*
enied * partner's costs, *previous*		0.131**		0.093*
elped * focal's costs, *entire*				0.007
eceived * partner's costs, *entire*				0.027
enied * partner's costs, *entire*				-0.065
s	Yes	Yes	Yes	Yes
costs focal actor	-0.136***	-0.031	-0.157***	-0.078
g help focal actor	1.598***	1.624***	1.002*	1.161*
und	-2.397***	-2.428***	-2.134***	-2.186**
nt	0.731*	-0.379	1.858***	0.937
s Constant	-0.014	-0.018	0.083	0.097

mmary and outlook

eople do not simply condition on past behavior as assumed by direct reciprocity models

ctors also account for differences between themselves and others, although asymmetry
ffects fade away further back in the past.

ext step: clarify the effects associated with focal actor's costs versus partner's costs an
tentions.

uture plan: Simulations, robustness tests (further experiments), asymmetric backward-
oking reciprocity model.

Thank you for your attention

ferences

Andreoni, J. and J. Miller (1993). Rational Cooperation in the Finitely Repeated Prisoner's Dilemma: Experimenta
Evidence. Economic Journal, 103. 570-585

Axelrod, R. (1984). *The Evolution of Cooperation*. New York: Basic Books

Buskens, V., Raub, W. and J. van der Veer (2009). Embedded Trust: An Experiment on Learning and Control Effects.
Theory and Technology. 122-136

Cialdini, R. B. (2001). Influence: Science and Practice. Boston (MA): Allyn & Bacon

Diekmann, A. (2004). The Power of Reciprocity: Fairness, Reciprocity, and Stakes in Variants of the Dictator Game.
The Journal of Conflict Resolution, 48. 487-505

Falk, A., Fehr, E., and Fischbacher, U. (2008). Testing Theories of Fairness – Intentions Matter. *Games and*
Economic Behavior 62. 287 – 303

Falk, A. and U. Fischbacher (2006). A Theory of Reciprocity. Games and Economic Behavior, 54. 293-315

Fehr, E., Fischbacher, U. and S. Gaechter (2002). Strong Reciprocity, Human Cooperation, and the Enforcement of
Social Norms. Human Nature, 13(1). 1-25

Fehr, E. and U. Fischbacher (2003). The Nature of Human Altruism. Nature 425.

Fehr, E. and U. Fischbacher (2004). Social Norms and Human Cooperation. Trends in Cognitive Sciences, 8(4). 185-
190

Friedmann, J. W. (1977). Oligopoly and the Theory of Games. Amsterdam, North-Holland

Gaechter, S. and A. Falk (2002). Reputation and Reciprocity: Consequences for the Labour Relation. Scand. J. Econ.
104. 1-26

Gouldner, A.W. (1960). The Norm of Reciprocity: A Preliminary Statement. *American Sociological Review* 25, 161-178

Keser, C. and F. van Winden (2000). Conditional Cooperation and Voluntary Contribution to Public Goods. Scand. J.
Econ, 102. 23-39

Kunda, Z. (2002). Social Cognition. Making Sense of People. Cambridge (MA): MIT Press

Mauss, M. (1990). The Gift: The Form of Reason for Exchange in an Archaic Society. London: Routledge

Nowak, M. and K. Sigmund (1998). Evolution of Indirect Reciprocity by Image Scoring. Nature, 393. 573-577

Nowak, M. and K. Sigmund (2005). Evolution of Indirect Reciprocity. Nature 437, 1291-1298

Rabin, M. (1993). Incorporating Fairness into game theory and economics. Q. J. Econ., 114. 817-868

Snijders, C. (1996). Trust and Commitments. Amsterdam: Thela Thesis

Trivers, R.L. (1971). The Evolution of Reciprocal Altruism. Q. Review of Biology, 46. 35-57

Vogt, S. and J. Weesie (2004). Social Support among Heterogeneous Partners. *Analyse & Kritik* 26, 398-422.

Vogt, S. and J. Weesie (2006). Social Support among Heterogeneous Partners: An Experimental Test. *Journal of*
Economic Interaction and Coordination 1, 215-232

Vogt, S., J. Weesie, and W. Raub (2006). Social Support in Opportunity and Threat Situations. *Iscore Paper* No. 237,

ltilevel Logistic Regression with Random Effects

ject *i*'s decision whether or not to provide support depends on

general willingness to provide support (θ)
decision situation (η).

$$y_{ijt} = 1 \mid \theta_i, \eta_t) = \frac{e^{\theta_i - \eta_{jt}}}{1 + e^{\theta_i - \eta_{jt}}}$$

t (prob that i provides help in condition l, at time t) $= c_l + \beta_1 P_{it} + \beta_2 A_{it} + \beta_3 AP_{it} + contr$