

Are people cooperative?

A survey on experimental research of behaviour in social dilemma situations: motives, patterns and implications for policy-makers

Kurzfassung

Den Sozial- und Wirtschaftswissenschaften wurden in den vergangenen zwei Jahrzehnten durch den Einsatz leistungsfähiger experimenteller Methoden sowie interdisziplinärer Forschungszusammenarbeit zum Entscheidungsverhalten von Individuen in sogenannten Sozialen Dilemmasituationen entscheidende neue Impulse beschert. Vorliegende Überblicksarbeit fasst diese Entwicklungen zusammen.

Teil 1 (Kapitel 2 bis 4) der Arbeit stellt verschiedene Theorien zum Studium individuellen Verhaltens und deren Prognosen über das jeweils zu erwartende Verhalten in Sozialen Dilemmasituationen vor. Den Ausgangspunkt der Argumentation bildet hierbei die Überzeugung, dass das in der Ökonomie vorherrschende Verhaltensmodell, der Homo Oeconomicus, die soziale Realität ohne Berücksichtigung pro-sozialen, insbesondere reziproken Verhaltens weit weniger universell abzubilden in der Lage ist als allgemein angenommen. Reziprokes Verhalten ist im Gegensatz zu strikt rationalem (egoistischen, nutzenmaximierenden) Verhalten durch die Einbeziehung von Fairness-Erwägungen gekennzeichnet: werden Individuen vom Gegenüber fair oder freundlich behandelt, sind sie ihrerseits bereit, ihr Gegenüber fair (kooperativ) oder freundlich zu behandeln, bzw. faire Verhalten zu belohnen, und unfaires Verhalten zu bestrafen, selbst wenn dies mit materiellen Kosten (für das Individuum) verbunden ist. Für welche Reaktion sich Individuen entscheiden hängt dabei von einer Vielzahl von Faktoren ab, die sich in situative (z.B. soziale Normen, institutionelle Arrangements, in die Entscheidungen eingebettet sind usw.) und die Persönlichkeit charakterisierende unterscheiden lassen.

Teil 2 (Kapitel 5 und 6) geht mittels einer Betrachtung empirischer Studien der Frage nach, ob sich Menschen tatsächlich entsprechend der in Teil 1 dar-

gestellten Annahmen verhalten, und welche Motive sie jeweils zu Entscheidungen bewegen. Pro-soziales Verhalten kann dabei bei einem großen Teil der Experimentalteilnehmer nachgewiesen werden. Individuen orientieren sich beispielsweise in Ihren Entscheidungen daran, welche Intentionen sie hinter den Entscheidungen anderer vermuten. Aus den empirischen Studien lassen sich ferner eine Reihe von stabilen, das Verhalten beeinflussenden Faktoren und deren Wirkrichtung extrahieren. Besonders interessant sind dabei Verhaltensweisen, die intrinsisch motiviert sind, und daher freiwillig unternommen werden.

Die in Teil 2 dargestellten Verhaltensprinzipien werden in Teil 3 (Kapitel 7 bis 10) auf verschiedene politikrelevante Bereiche übertragen. Insbesondere werden Konsequenzen diskutiert, die pro-soziales Verhalten für die ökonomische Politikberatung bietet (z.B. zu Fairnesserwägungen im Steuersystem, der Akzeptanz sozialpolitischer Maßnahmen, verstärkten politischen Partizipationsrechten usw.). Aus der Existenz des Homo Reciprocans folgt, dass Gesellschaften und soziale Beziehungen über informelle Mechanismen zur Durchsetzung von Normen und Regeln verfügen, die mit den Annahmen des Homo Oeconomicus nicht erklärbar sind. Diese zu formalen Durchsetzungsmechanismen komplementären Mechanismen bilden einen wesentlichen Teil des Sozialkapitals einer Gesellschaft, welches wiederum durch die Politik genutzt und verstärkt werden kann: während etwa auf nationaler Ebene dem Staat die hoheitliche Gewalt zur Durchsetzung von Aufgaben zur Verfügung steht (z. B. Gesetze zur Einhebung von Steuern), aber im Management von transnationalen öffentlichen Gütern (z.B. Klimawandel) eine Vertragsdurchsetzung schwierig bis unmöglich ist, sind Politikinstrumente, die Individuen dazu motivieren, Handlungen zur Lösung sozialer Dilemmasituationen freiwillig zu unternehmen, entscheidend. Politiken, die derart gestaltet sind, Anreize (Signale) zu setzen, die zu einem verstärkenden crowding-in intrinsischer Motivation bei denjenigen Adressaten

führen, die bereits die gewünschte Verhaltensweise angenommen haben, und gleichzeitig attraktive extrinsische Anreize für diejenigen bereithalten, die sich noch nicht auf die gewünschte Art und Weise verhalten, bieten ein besonders erfolversprechendes Potential.

Abstract

The presence of public goods raises some fundamental questions about the organization of society and markets as they address questions on the conflict between group and individual interest. While free riding is rational at the individual level, it produces socially undesirable outcomes at the aggregate level. This survey reviews recent work by social scientists intended to isolate fundamental behavioural and motivational aspects in these conflict situations. Two decades of experimental research have revealed that people tend to contribute to public goods at higher levels than theory (*Homo Oeconomicus*) predicts. Going beyond simply demonstrating an “anomaly” (in neoclassical terms) or behavioural phenomenon, a significant number of experimental work has examined the motives that operate in these situations, the contextual variables that influence operating motives and individual differences in the relative strengths and stability of these motives.

Part I (Ch. 2-4) introduces the setting and addresses theoretical considerations on economic theories of pro-social, i.e., altruistic or reciprocal behaviour to gain insights in the individuals’ decision principles, that is, approaches that try to account for persistent behavioural patterns by incorporating various motivational aspects. Questions include: How do people decide about their (level of) cooperation and what affects their decision in general? Answers range - to name a few - from material incentives, innate desires, empathy, moral intuitions, the composition of the group they are in, pressure social norms exert, to individual characteristics of a person: Humans are torn by conflicting desires and wants. Which of these will be chosen depends on various situational factors that frame choices. Social norms play an important role in fostering cooperation as they serve the function of restraining egoistic impulses in favour of collective outcomes in that they imply that (certain) people should perform a prescribed behaviour and not perform a proscribed behaviour.

Part II (CH. 5 and 6) discusses recent empirical findings and tries to derive stable “stylized facts” which influence behaviour. Major stable results include the empirical confirmation that people value fairness, despise inequality and fear punishment. People evaluate the behaviour of others before deciding on their own preferences for a given situation. This implies that they are also concerned about the intentions that lead other people to behavioural choices. In response to friendly behaviour of others, many people act in a (more) cooperative way (referred to as reciprocal behaviour). When treated unfriendly, however, they may response hostile. If they feel unfairly treated, people are ready to punish others, and they will, even at a cost to themselves. Given the right enforcement tools, almost full cooperation and thus, (to some degree) informal and cost-effective self-governance is possible, allowing new forms of policy interventions.

Part III (CH. 7-10) elaborates these policy implications. While, for instance, governments for national policies have the authority to impose taxes or other coercive mechanisms (i.e., institutions, laws), in the management of international common pool resources (e.g., climate change), where supranational enforcement of contracts is difficult, policy instruments to elicit voluntary contributions are crucial. Policy design has much to gain from the promising results of “conditional cooperation” and the results on all the other motives underlying voluntary behaviour. Some incentives (signals), for example, have the potential to crowd-in intrinsic motivation by recognizing and acknowledging it. Well-designed policies may therefore be able to strengthen existing intrinsic motivations amongst those already contributing, while at the same time providing attractive extrinsic incentives to encourage others to contribute. Other incentives can do more harm than good: they are costly to implement and can actually cause a decline in public good provision. Advice for policy makers should therefore constitute to be careful when introducing formal institutions into the mix of (endogenously existing) informal institutions and motivations that surround public goods.

Finally, Part III sketches some perspectives for future research. While the literature on the relationship between public policy, motivation and actual behaviour has expanded in recent years, so far, there do not seem to be any universal answers to the questions posed through-out this work. Leading scholars of the field argue for an intensified effort to unify the (various and mostly incompatible) theories and

models towards a parsimony behavioural theory of human choice for the social sciences.

Preface

During the last two decades, the (experimental) research on behaviour in social dilemma environments has made much progress with excellent programs maintained multi-disciplinarily by economists, political scientists, (social) psychologists and sociologists. A key insight is that people typically do not behave as selfish as traditional (neoclassical) economics assume them to do. That's why research on voluntary contribution mechanisms (VCM) has brought the fundamental behavioural beliefs and hypothesis of economics into conflict with those of other fields¹⁾ (Ledyard 1995, p. 12). While homo oeconomicus (the purely rational, utility and profit-maximizing, sexless, selfish guy) has served very well for behavioural assumptions many years and still does in many applications²⁾, economists should not "tend to constrain their attention to a narrow and empirically questionable view of human motivation" (Fehr and Falk 2002) when it comes to explaining findings in social dilemma experiments. For instance, Frey and Meier's (2004) results indicate that monetary incentives (which – according to standard economic theory – generally should lead Homo Oeconomicus to increase the effort in doing something for which money is provided) may even backfire and reduce (crowd-out) the motivation and performance of subjects in doing something (e.g., comply with rules).

It is a purpose of this work to present evidence that the traditional view of human motivation conceptualized in Homo Oeconomicus may limit our understanding of the importance, determinants and effects of pro-social (i.e., the counterpart to self-interested) behaviour. That is, in the Frey and Meier (2004) case, neglecting empirical evidence, suggesting that powerful non-pecuniary motives like the desire to reciprocate (or the desire to avoid social inequality), also shape human behaviour. In other words, a core question of this work is about the conditions that influence pro-social or other-regarding behaviour. If it is possible to isolate the conditions that lead to pro-social behaviour, this will increase the understanding of the motivations to (voluntarily) contribute money and time to public goods³⁾. While motivational aspects have been addressed by psychologists for decades, distinguishing individual motivations using survey answers, economists for a long time did not

control for different types of individuals (incorporating ethnicity, gender, educational and social background as exterior and moral values or trust, obligation, generosity or anger as interior motivational typology into their rationale) when testing economic decision theory. As a consequence, this may not only have created a bias in the interpretation of the experimental data, but indeed has, following the evidence presented herein. Behaviour is strongly contingent upon the heterogeneity (with)in individuals.

Another goal of this work is to reflect the current research agendas for two reasons: getting a clue, for a novice to this field like me, what is currently done in this branch of economics anyway (selfish part), and, with the notion that the research agendas had moved massively, to document the most important traits for other novices (pro-social part). None of the currently most debated topics (like punishment, heterogeneity, reciprocity (conditional cooperation)) have been addressed in Ledyard's systematic review from 1995.

Some meta-information: selected literature and methodology used

A note on the selection of the literature reviewed herein: owing to diversity, in selecting the essence of this field (experimental economics), I concentrated on the most influencing (by which I mean the most cited) researchers publishing in major peer-reviewed journals. This implies that only the mainstream of this branch of research is considered. Thus, for instance, the (particularly since the year 2000) growing number of papers that have emerged grounded on evolutionary reasoning have not (really) been considered here.

In terms of structure and methodology, those chapters of the review, surveying theories and deriving "theoretical predictions" (chapters 2 to 4), heavily rely on the surveys by Ledyard (1995) and Meier (2004). In case there were (other or additional) papers guiding specific chapters, it is mentioned directly therein.

The approach chosen to tackle this topic is a qualitative one, reviewing theories and motives and collecting results, agreed upon most experimentalists, which are likely to influence the conditions under which people contribute to public goods. Thus, the survey is free of any mathematics, and (experimental) design aspects are described in prose, the reader therefore "is strongly encouraged to consult the original papers if they want to know the details of the experimental designs" (Ledyard 1995, p. 36). In addition, the motto (of course) was breadth over

depth (the opposite wouldn't have been possible anyway).

A note on how to best read this survey

Subsections 1.1 to 1.3 provide a rough disposition of the topics covered within this work⁴). A classification of the social dilemma literature as a whole (subsection 1.1) is followed by a classification of economic theories to explain individual behaviour in these situations (subsection 1.2). Section 1.3 finally sketches which tools economists use to systematically study behaviour, as a primer to theoretical considerations on pro-social behaviour (starting with section 2).

Basic information on each chapter's content (and on how it proceeds) can also be found at the end of the introductory and the beginning of each (major) chapter.

I tried to modularize coherent information wherever possible for two reasons. First, this allows selective reading (in that most chapters can be read independently of one another) without losing the "red thread". Short summaries after each major part of the work have been included. Second, related trains of thought are kept together and presented coherently each time. To me personally, this has alleviated a general understanding of certain important and recurring patterns, which, at first blush, seem to be identical, but (sometimes) predict contrary results (which can be due to small changes in the decisional contexts). I hope that this procedure contributes to a better traceability. However, this proceeding brings about some redundancy and overlapping.

Chapter 6 (more precisely subsection 6.2) is not meant for direct reading, I suggest a lexical use only. It contains (specific) information that has been cross-referenced from other chapters (wherever suitable). Subsection 6.3 presents the essentials of chapter 6 at a glance. Chapters 7 – 10, instead, should be seen as a unity and be read successively.

1. Introduction

The presence of public goods raises some fundamental questions about the organization of society

and markets as they address questions on the conflict between group and individual interest. As a distinctive characteristic to public goods, inefficiency of public good production is predicated on assumptions of non-rivalry and non-exclusion (free access to the common good irrespective of each person's contribution to the provision of it). Under this purely voluntary provision, strategic behaviour typically results in the incentive to free ride, i.e., to enjoy the benefits while refusing to finance its provision. While free riding is rational at the individual level, it produces socially undesirable outcomes at the aggregate level (Decker et al. 2002). Aside from free-riding, as its worst-case (i.e., contribute nothing at all), there is more generally an incentive to overuse the public good (usually referred to as "the tragedy of the commons"), or, put differently: when people share the obligation to provide them, they tend to undersupply (allocate too little to the public good relative to the socially efficient or optimal amount; Dellarocas et al. 2004).

Interestingly, however, the general consensus of experimental results conducted by economists and scholars in other social sciences to solve this dilemma is that people tend to contribute to public goods at higher levels than theory predicts. Extensive surveys by Ledyard (1995) and Davis and Holt (1993) show that, on average, subjects contribute between 40 and 60 percent of their endowment⁵) to a public good rather than using it for private activities.

However, this is true for early rounds (Public Good Games, the way by which experimentalists assess behaviour economically, are typically repeated), but towards the last rounds, contributions decline and subjects steadily begin to free ride. A few questions then arise: Do subjects learn actualizing their strategic behaviour over time or do the incentives for contributing change? Do all subjects behave in the same way than what we obtain at the aggregate level, or does the general finding correspond to different behavioural patterns of different types of subjects? Answering the latter question would help both to better understand individual interactions and to explain why there is under-supply. Moreover, instead of proposing only one explanation for under-supply, it may be possible that several parameters at the same time influence individual behaviour (Hichri 2002, p. 3).

These few exemplary questions posed above are part of an enormous body of literature dealing with behaviour in dilemma situations. This is why we (for reasons of comprehensibility of subsequent chapters) first glance at the bigger picture with a classification

of the social dilemma literature and its currently most debated topics.

1.1 A Classification of the Social Dilemma Literature

For a preliminary (uncommented) overview, and as a remainder for the topics covered in this work,

Figure 1 (p. 21) sketches the essential topics in dilemma research⁶⁾, and cross-references these topics to where they are discussed within this work. People's (personal) identity on the one hand, and the situation (the environment) they are exposed to, on the other hand, are decisive for differences in behaviour in the first place. The elements listed in

Figure 1 all influence cooperation behaviour in one or the other way⁷⁾. Based on this systematic classification by Weber et al. (2004), in this work, we will assess the causes and motives of why people behave as they do. In order to achieve this, different theoretic models incorporating these elements have been proposed, which we will classify first in section 1.2. The parentheses denote sections where these elements are addressed within this work.

1.2 A Classification of (Economic) Theories explaining Individuals' Behaviour

Various theories to explain (voluntary) contributions of time and money have been proposed, either based on self-interest (e.g., being simultaneously enabled to benefit from the consumption of a private good like (external) material rewards, prestige or to be able to signal one's wealth) or on non-selfish or so called "other-regarding" behaviour. For purely selfish motives, Glazer and Konrad (1996) propose a signalling theory of charity, where people contribute to charities to signal their social status. One example for other-regarding behaviour is altruism. Altruistic behaviour assumes that an individual's utility is positively correlated to the utility of the receiver, whereas egoistic (self-interested) behaviour is defined as the maximization of a utility function defined only over personal consumption of public and private goods (Sefton et al. 2000). The hypothesis that people are altruistic has a long tradition in economics and has been used to explain charitable giving and the voluntary provision of public goods (Becker 1974), but, however, latest experimental research suggests that altruism theories are not solely able to

explain behavioural motives left unexplained by Homo Oeconomicus (e.g., Frey and Meier 2004).

Rabin (1993) and Fehr and Schmidt (1999) emphasize reciprocity in a person's behaviour. The core of this approach is that "people like to help those who are helping them, and to hurt those who are hurting them" (Rabin 1993, p. 1281, Decker et al. 2002, p. 7). Levine (1998) presents a theory of altruism and spitefulness in which people's utility depends on their own and their fellows' pay-offs. The degree to which a person takes other people's payoffs into account is specific to that person and varies among the population (see, e.g., section 2.2.7 and Decker et al. 2002, p. 7).

Other ideas to solving the dilemma of free riding include implementing additional institutions that create incentives for rational individuals to participate in the provision, e.g., a sanctioning system. Unfortunately, in a framework of rationality and selfishness, a new dilemma arises: no individual is willing to bear the costs of implementing or supporting the institution. This problem is known as the second order dilemma (Oliver 1980, Bates 1988, Decker et al. 2002, p.1). However, collective rules, agreed upon by all subjects involved, found in a joint and organized way like in votes, and thus enforceable, can be able to implement a sanctioning system that is capable to sustainably punish potential free-riders to share associated costs. Ostrom (1990), for instance, mentions the European Stability Pact, containing a sanctioning system in which the EMU members decide together on the punishment of countries endangering the stability of the Euro (Decker et al 2002, p. 2). Financing the collective production of public goods by tax money can be seen as another solution to free riding. Yet, due to the low probability of getting caught and being penalized, paying taxes is also a public good and people will also try to evade paying in order to pursue their self-interest (e.g., Meier 2004, p.10f, Alm et. al. 1992).

Finally, two recent approaches pioneered by Bolton and Ockenfels (2000) on the one hand, and by Fehr and Schmidt (1999) on the other hand, have received attention in the public good context and beyond. They have in common the introduction of an inclination to equity in pay-offs into peoples' motivation.

Figure 1 - Cooperation in social dilemmas. A Classification of the Social Dilemma Literature and Elements Influencing Behaviour.

Source: own compilation with minor modifications to Weber et al. (2004, p. 287).

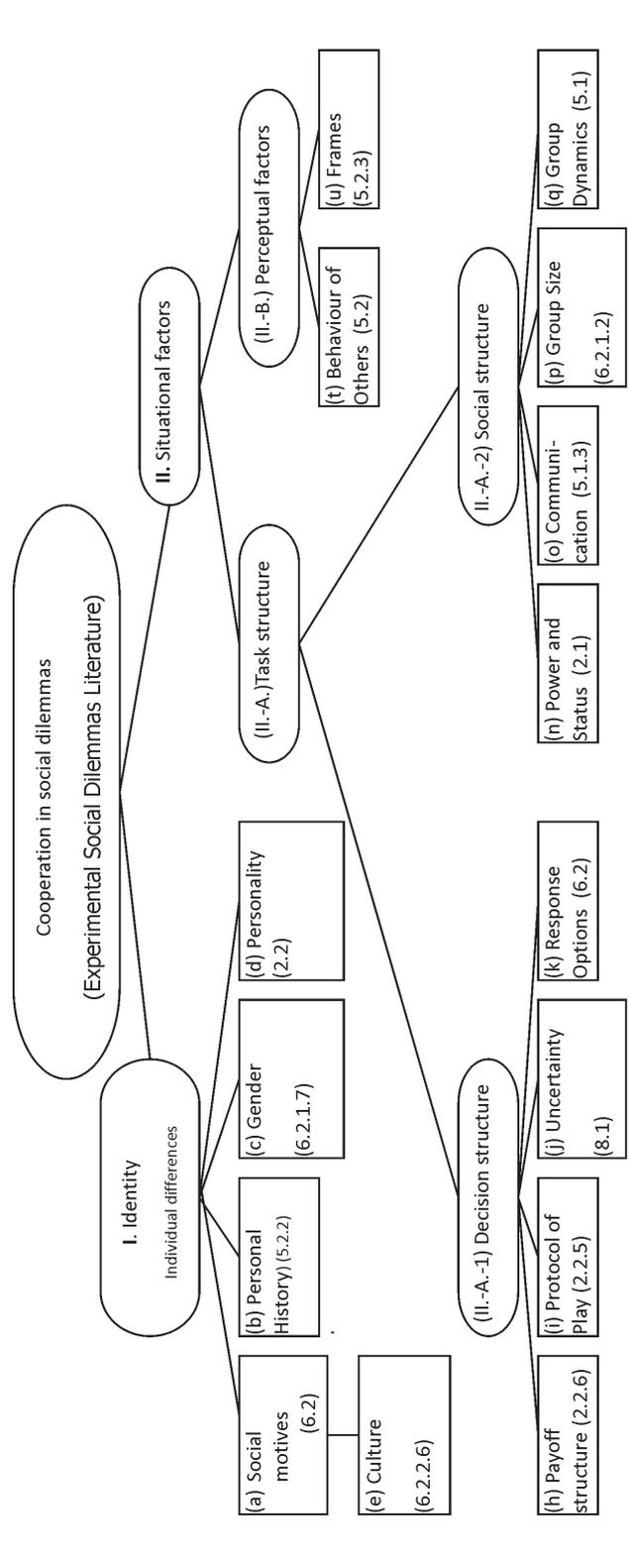
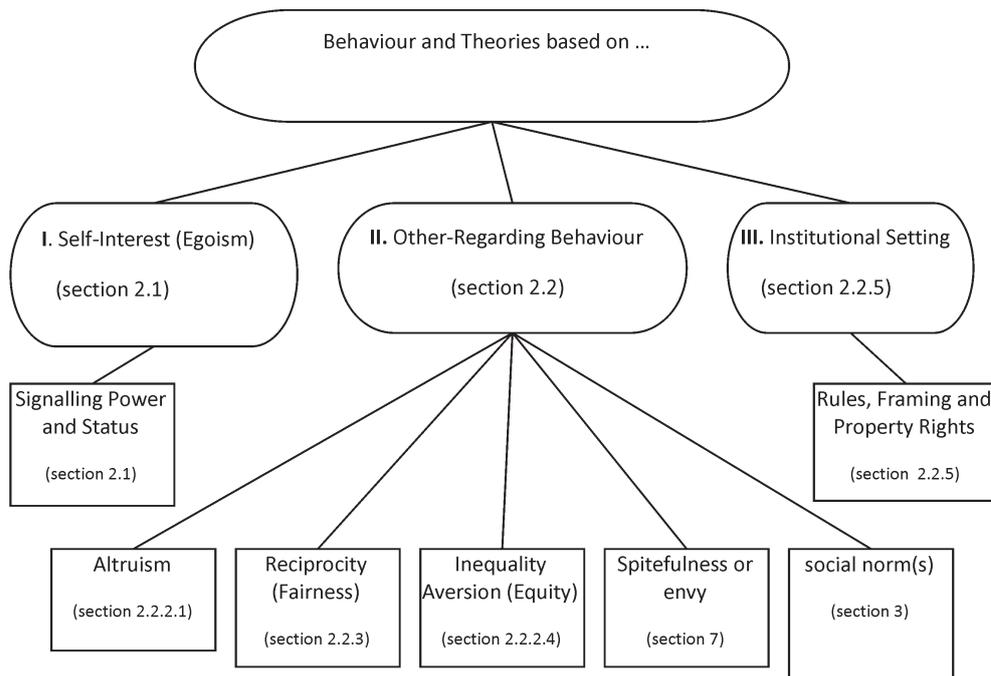


Figure 2 summarizes the three most prominent branches of theories to explain contributions in social dilemma situations: theories based on self-interest (section 2.1), theories of other-regarding social preferences (section 2.2), and theories that emphasize the importance of the institutional setting (section 2.2.5).

1.3 The Systematic Study of Cooperation

Ledyard (1995) argues that questions concerning collective action have been posed throughout the history “on the basis of much introspection and little evidence. With the development of an ex-perimental methodology for economics and in consideration of results from social psychology (for behavioural assumptions), we now enter a new era in the deba-

Figure 2 – A Classification of Theories Explaining Contributions in Social Dilemma Situations



Source: own compilation.

Before we turn to discuss these theories in detail (in section 2), we will address how economists systematically study dilemma situations, how laboratory experiments look like and what their methodological approach is. For the latter, economists consider questions related to analyzing behaviour and decision-making a modelling issue in Game Theory as this “appears to be the simplest environment within which to uncover variations in behaviour in groups” (Ledyard 1995, p. 4).

tes” (p. 2). An important feature of behavioural economics research, as already briefly stressed above, is its reliance on laboratory experiments. Simple, carefully controlled, laboratory experiments have proved especially valuable for conducting the kind of tests of economic assumptions that are central to the behavioural approach (discussed in more detail in section 1.3.2). For instance, much of the best evidence for both bounded-rationality and non-egoistic preferences is obtained from lab experiments (e.g., Forsythe et al. 1994, Hoffman et al. 1994), often because alternative explanations can be carefully ruled out by experimental control (also referred to as mechanism design, e.g., transaction costs, imperfect information, complete anonymity). Experiments are also useful for creating choices that sharply distinguish between emerging theories, since such “diagnostic choices” are not always present in naturally

occurring settings (Weber and Camerer 2006). Discussing experimental design, i.e., how cooperation can be captured in the lab, will prelude the next two subsections.

Let us turn to some central characteristics of game experiments.

1.3.1 Game Experiments

Doing game experiments for studying (strategic) behaviour has several advantages. One of them is that Game Theory provides a taxonomy of social situations, which parse the social world. This offers comparability across subject pools (assuming care is taken in controlling for differences in cultural specifics, language, interactions with experimenters, and so forth). While comparability is not perfect, it is at least as good as most qualitative measures. A further advantage of experimental games is replicability. The fact that experiments are replicable is a powerful tool for creating consensus about their interpretation in the scientific community. Furthermore, games allow imposing a clear structure on concepts, which are often vague or fuzzy⁸ (Camerer and Fehr 2002).

Finally, formalizing real-world scenarios like social phenomena reduce complexity. Of course, games are reductions of social phenomena to something extremely simple, but this is often needed to be able to cope with it mathematically.

Figure 3 provides an overview of seven game types that are most widely used for experimental studies in social dilemma situations. We will pick up these games in the following subsection 1.3.2 to illustrate how they are used to capture cooperation in the laboratory and why there exist different types of games at all.

Figure 3 - Seven Experimental Games Useful for Measuring Social Preferences

Source: Camerer and Fehr (2002, p. 8f.)

Game	Definition of the Game	Real life Example	Predictions with rational and selfish players	Experimental regularities, References	Interpretation
Prisoners' dilemma Game	Two players, each of whom can either cooperate or defect. Payoffs are as follows: Cooperate Defect Cooperate H,H S,T Defect T,S L,L $H > L, T > H, L > S$	Production of negative externalities (pollution, loud noise), exchange without binding contracts, status competition.	Defect	50% choose Cooperate. Communication increases frequency of cooperation Dawes (1980)**	Reciprocate expected cooperation
Public Goods Game	n players simultaneously decide about their contribution g_i ($0 \leq g_i \leq y_i$) where y_i is players' endowment; each player i earns $\pi_i = y_i - g_i + mG$ where G is the sum of all contributions and $m < 1 < nm$.	Team compensation, cooperative production in simple societies, overuse of common resources (e.g., water, fishing grounds)	Each player contributes nothing, i.e. $g_i = 0$.	Players contribute 50% of y_i in the one-shot game. Contributions unravel over time. Majority chooses $g_i = 0$ in final period. Communication strongly increases cooperation. Individual punishment opportunities greatly increase contributions. Ledyard (1995)**.	Reciprocate expected cooperation
Ultimatum Game	Division of a fixed sum of money S between a Proposer and a Responder. Proposer offers x . If Responder rejects x both earn zero, if x is accepted the Proposer earns $S - x$ and the Responder earns x .	Monopoly pricing of a perishable good, "11 th hour" settlement offers before a time deadline	Offer $x = \epsilon$; where ϵ is the smallest money unit. Any $x > 0$ is accepted.	Most offers are between .3 and .55. $x < .25$ rejected half the time. Competition among Proposers has a strong x -increasing effect; competition among Responders strongly decreases x . Güth et al (1982)*, Camerer (in press)**	Responders punish unfair offers; negative reciprocity
Dictator Game	Like the ultimatum game but the Responder cannot reject, i.e., the "Proposer" dictates ($S-x, x$).	Charitable sharing of a windfall gain (lottery winners giving anonymously to strangers)	No sharing, i.e., $x = 0$	On average "Proposers" allocate $x = .25$. Strong variations across experiments and across individuals Kahneman et al (1986)*, Camerer (in press)**	Pure altruism

Trust Game	Investor has endowment S and makes a transfer y between 0 and S to the Trustee. Trustee receives $3y$ and can send back any x between 0 and $3y$. Investor earns $S - y + x$. Trustee earns $3y - x$.	Sequential exchange without binding contracts (buying from sellers on Ebay)	Trustee repays nothing: $x = 0$. Investor invests nothing: $y = 0$.	On average $y = .5S$ and trustees repay slightly less than $.5S$. x is increasing in y .	Trustees show positive reciprocity.
Gift Exchange Game	"Employer" offers a wage w to the "worker" and announces a desired effort level \hat{e} . If worker rejects (w, \hat{e}) both earn nothing. If worker accepts, he can choose any e between 1 and 10 . Then employer earns $10e - w$ and worker earn $w - c(e)$. $c(e)$ is the effort cost which is strictly increasing in e .	Noncontractibility or nonenforceability of the performance (effort, quality of goods) of workers or sellers.	Worker chooses $e = 1$. Employer pays the minimum wage.	Effort increases with the wage w . Employers pay wages that are far above the minimum. Workers accept offers with low wages but respond with $e = 1$. In contrast to the ultimatum game competition among workers (i.e., Responders) has no impact on wage offers.	Workers reciprocate generous wage offers. Employers appeal to workers' reciprocity by offering generous wages.
Third Party Punishment Game	A and B play a dictator game. C observes how much of amount S is allocated to B . C can punish A but the punishment is also costly for C .	Social disapproval of unacceptable treatment of others (scolding neighbors).	A allocates nothing to B . C never punishes A .	Punishment of A is the higher the less A allocates to B .	C sanctions violation of a sharing norm.

Note: ** denotes survey papers, * denotes papers that introduced the respective games.

1.3.2 Impressions of Capturing Cooperation in the Laboratory

In its most basic form, economists study the essence of strategic situations (and their underlying cooperation behaviour) in the “prisoners’ dilemma game” (PD). In the PD, two players can simultaneously choose between cooperation and defection⁹⁾, whereas the players do not know the opposites’ decisions. For any given strategy of the opponent, it is always better for a player to defect. The PD resembles a generic cooperation dilemma in which purely selfish behaviour leads to the defection of both players, even though mutual cooperation would maximize their joint payoff. More generally, a “Public Good Game”¹⁰⁾ (PGG) consists of a number of players (subjects) who are placed in a group and endowed with an identical number of tokens (Fehr and Rockenbach 2003, Walker and Halloran 2004). Each subject then (simultaneously) has two choices: it chooses what percentage of his or her endowment to place in the group account (i.e., a project that is beneficial for the entire group, the public good) or to keep in his or her private account. A token placed in the group account yields a positive return to each member of the group (the amount of tokens is divided by the number of participating subjects). A token placed in a subject’s private account gives a positive return solely to that subject (Walker and Halloran 2004). The dilemma arises from the fact that all group members profit equally from the public good, no matter whether they contributed or not, and that each player receives a lower individual profit from the tokens contributed to the public good than from the tokens kept privately. A purely selfish player thus refuses to contribute anything to the public good and free rides on the contributions of others.

In other words, if subjects’ preferences are based solely on monetary return, the Nash equilibrium strategy¹¹⁾ for any individual is to place all their tokens in their private account (Walker and Halloran 2004). Hence, the public good is not provided in a group of purely selfish subjects, although provision would be the joint interest of the group (Fehr and Rockenbach 2003). Put differently in game theoretic terms, given that the number of decision rounds is finite, contributing nothing to the public good in all periods is the unique subgame perfect equilibrium. This prediction is based on the assumption of common knowledge that players are rational payoff maximizers. Unless otherwise specified, when we refer to a “dominant strategy”, “equilibrium contri-

bution/solution” or “Nash equilibrium”, we rely on this assumption (Willinger and Ziegelmeyer 2001).

Aside from the PD, however, there exist several other games. The game type (=design) used (e.g., Prisoners Dilemma (PD), Dictatorship (DG) or Ultimatum Games (UG)) differs based on the underlying questions the experimenter wants to address or patterns (of behaviour) he wants to reveal¹²⁾. While PD and public goods games (a generalized PD) capture important components of social life, they cannot typically distinguish between players who are self-interested, and players who would like to reciprocate but hold pessimistic beliefs towards others not willing to cooperate or contribute. Three other games have proved useful in separating these assumptions and measuring a wider range of social preferences - Ultimatum, Dictator, and Trust Games (Camerer and Fehr 2002, p. 13). We will briefly discuss the main ingredients of the Ultimatum and Dictatorship Game as in the second (empirical) part we argue based on game-specific details.

The Ultimatum (UG) and Dictatorship Game (DG)

Following Gurven’s (2004) description in the two-player UG and DGs, which were first introduced by Güth et al. (1982), a sum of money (the endowment) is given to one individual of a pair (called proposer). The proposer anonymously makes an offer, ranging from 0% to 100% of the endowment, to the other member of the pair (called responder). In the UG, the responder can accept and thereby receive the offer, or, if the responder rejects the offer, both members of the pair receive nothing at all. The DG is a special case of an UG where the responder has no opportunity to reject the offer; the responder just receives whatever was offered. Because the identities of proposers and responders are not known in these two games, any incentive to signal, show-off, or seek a desirable reputation, is removed. The game-theoretic optimal behaviour (dominant strategy), assuming self-interest and profit maximization, is for the responder in the UG to accept any positive offer (because any money is better than none), while the proposer should offer the minimal amount possible in the UG and offer nothing in the DG. Experimental results for the UG and DG show that modal proposals among most players from western populations consistently range around 50%, while mean offers are only slightly less (40–50%) (Camerer and Thaler 1995, Roth 1995).

Finally, a further important and robust result in the UG, across hundreds of experiments, is that proposals offering the responder less than 20% of the available endowment are rejected with a probability of 0.4 to 0.6. They are deemed as inequitable. In addition, the probability of rejection is decreasing with the size of the offer (see, e.g., Roth (1995) and the references therein, Gurven 2004, and Fehr and Fischbacher 2002, p. 5).

The remainder of this survey is organized as follows. In Section 2, theoretical considerations and a survey of theories on self-interested and pro-social behaviour are presented, starting with the question why economists should focus on theories of pro-social behaviour at all. In each subsection, one specific theory is investigated and predictions for behaviour are derived. Section 3 addresses the importance social norms possess in fostering cooperation. Questions pertain how social norms are functional in regulating social life, and how they evolve (or are invoked). Section 4 summarizes the main results.

Part II, starting with section 5, offers a classification of recent empirical laboratory (and field) evidence. Section 6 isolates and orders contextual variables that influence or shape behaviour. Whenever possible, the strengths (or variations) of respective behavioural patterns are documented. Part III, starting with section 7, summarizes, and sections 8 and 9 reflect possible implications for policy-makers. Section 10 finally concludes and sketches some future perspectives.

2 Theoretical Considerations on Economic Theories of (pro-social) Behaviour

Why should economists be interested in a deeper understanding of pro-social behaviour anyway? Why not just stick to the self-interest hypothesis, which has had great success in many areas outside of economics (e.g., Becker 1976, Stigler 1984)? One reason has been mentioned, empirical investigations have shown that self-interest is not the single driving force of human behaviour (around 50% behave differently). Thus, why leave a large part of human behaviour unexplained? Considerations on theories of pro-social behaviour could produce testable hypothesis to explain in which situations self-interest will prevail and in which situations people behave more pro-socially. Taking this consideration into practice, deviating from the self-interest hypothesis has

important implications, i.e., in the political sphere (see sections 8 and 9). However, in order to understand policy implications, i.e., when governments offer (external) incentives to behave pro-socially, like tax reductions, or in order to design effective institutions, one has to know the conditions under which people are most likely to behave pro-socially. The latter is also particularly interesting for charitable organizations, where the economics of pro-social behaviour can provide information about methods to elicit voluntary contributions (see, e.g., Steinberg 1991a, Andreoni 1998, Meier 2004), we will address this in more detail in subsection 2.1.

The survey proceeds as follows¹³): section 2.1 presents explanations for contributions to public goods, which are based on strict self-interest. These “sophisticated” self-interest theories, however, can only partly explain pro-social behaviour such as charitable giving and volunteering. Section 2.2 presents the three most important sets of theories on non-selfish or “other-regarding” behaviour: theories based on pro-social preferences, theories based on the norm of reciprocity and approaches that focus on the institutional environment.

2.1 Behaviour and Theories based on (Extended) Self-Interest

To explain contributions of money and time to the financing and provision of public goods, various theories, which are either based on self-interest or use an extended version of the self-interest hypothesis, have been suggested. The three most prominent branches of theories posit either that:

1. the contribution to a public good simultaneously allows the consumption of a private good (e.g., people benefit from selective access to some goods, gain prestige or are able to signal their wealth), or
2. that incomplete information about the number of repetitions or about the rationality of the other individuals makes contribution the dominant strategy (Meier 2004, p. 13), or
3. that intrinsic motivational factors like community identification dominate extrinsic incentives (see subsection 2.2.1).

Let us briefly discuss the first hypothesis.

Signalling Prestige, Wealth and Status

Olson (1965) emphasized in a seminal paper on collective action that people may contribute to a public good if it is a precondition of receiving a private good. For example, donors of arts organizations may gain access to special events, gala dinners or exclusive box seats in the opera house they support, or may have exhibition halls named after them. In addition to those fringe benefits (i.e., additional services), volunteers may also receive job experience and a social network. Especially for mothers on maternity leave, volunteering can be seen as an investment in human capital and may be used as a re-entry strategy into full employment (Schram and Dunsing 1981). According to this reasoning, people contribute to public goods in order to receive a fringe benefit, which they otherwise could not get on the market (Meier 2004, p. 13).

Similarly, contributions to public goods, e.g., donations to charitable organizations, can increase the social standing of a donor (Harbaugh 1998a) or the donations can signal one's own wealth¹⁴). Especially if geographical distance does not allow signalling one's financial success with other prestigious goods like villas, yachts or cars, publishing charitable contributions may be an appropriate purpose. Despite the fact that prestige is not a material good, the important aspect of the "prestige motive" is that people instrumentally behave pro-socially to get an external reward (Meier 2004, p. 14).

Based on these (and further) arguments, scholars have derived the following predictions for individual behaviour:

If the provision of a private good is responsible for contributions to a public good,

- i) people will only contribute if selective incentives are offered, and
- ii) they will contribute the minimum amount required to receive the private good (in the literature it is referred to as the selective incentive hypothesis).

Some empirical studies have explicitly tested whether fringe benefits are an important motive for pro-social behaviour. Buraschi and Cornelli (2002), e.g., conclude that access to fringe benefits is an important motivation for becoming a donor. The hypothesis that do-nations may be driven by a desire to signal wealth in order to increase one's prestige is part-

ly supported in studies by Glazer and Konrad (1996) and Harbaugh (1998b). These authors analyze donations to US universities by their alumni. Universities publicize these donations in alumni journals. The authors have found that people choose to donate an amount just slightly greater than that needed to appear in a certain donations bracket (e.g., donations of \$500 – \$ 1000). Meier (2004) suggests that this evidence could support the notion that alumni donate strategically in order to appear in the next higher donations group (p. 14-15). However, according to Meier, further research should be addressed to the question on how much the prestige motive is based on social comparison and presumes that "probably, the prestige motive has much to do with the donation amount relative to other people" (p. 15).

The aforementioned evidence supports the hypothesis that fringe benefits and prestige are one motivation for pro-social behaviour. Many charities use fundraising techniques, which take this motive into account. For instance, they organize dinners with auctions where social comparison between potential donors is used as a method to increase donations. However, theory can only partly explain pro-social behaviour. Empirically, the provision of selective incentives can only explain voluntary contributions of money and time to public goods in isolated instances. In many situations, however, people donate money without the expectation of receiving a private good. This becomes evident especially with contributions taken anonymously and where the provision of fringe benefits is excluded a priori. In such situations, there is no possibility of receiving a private good or recognition from others as an external (material) reward for pro-social behaviour (Meier 2004, p. 15). This is what we now turn to: theories on other-regarding behaviour.

2.2 Behaviour and Theories Beyond Self-Interest

All motives for pro-social behaviour presented in the following sections rely and depend on something other than external reward. People behave pro-socially because they get an internal reward. Individuals have an "intrinsic motivation" (Deci 1975, Frey 1997a, Meier 2004) to undertake a certain task, e.g., to volunteer, to pay taxes, to vote, or to donate money to a good cause.

Three groups of prominent theories to explain pro-social behaviour can be distinguished:

1. Theories that are based on pro-social preferences. They assume that an individual's utility depends directly on the utility of other people (section 2.2.2).
2. Theories of reciprocity. They are based on the notion that individuals behave in a friendly manner when they are treated benevolently, and behave unkind, when they are treated unkindly (section 2.2.3).
3. A third group of approaches stresses the importance of the institutional environment for pro-social behaviour (section 2.2.5 and Meier 2004, p. 16).

The first two theoretical approaches focus more narrowly on motivational factors for pro-social behaviour¹⁵), whereas the third approach focuses more on the institutional environment, which on the one hand influences the importance of the two former motivations but on the other hand also points to motivations, which go beyond pro-social preferences and reciprocity. The definition (and assignment) of property rights (see subsection 2.2.5), for instance, is an important means in the use and effectiveness of institutions.

Before commencing with different theories on pro-social behaviour, let us parenthetically stick with the aforementioned intrinsic motivations individuals possess to undertake pro-social activities.

2.2.1 A Parenthesis on Intrinsic Motivational Factors

Psychology denotes internal factors as motivations that are ultimately rooted within the individual. Among these internal factors are intrinsic motivations, where a person is motivated either by feelings of enjoyment, or altruism¹⁶), where a person is motivated by the feeling of increasing the welfare of others (see subsection 2.2.2.2), or community identification, where a person is motivated by the social benefits derived from the activity of participating (George 2007).

An illustrative example for intrinsic motivational behaviour is the Open Source Software (OSS) community. Some programmers ('hackers') describe an "innate desire to code, and code, and code until the day they die" (Hars and Ou 2001, p. 26). Through their work, they are able to achieve what psychologist Mihaly Csikszentmihalyi calls "a state of flow" (George 2007). Specifically, he names eight elements of enjoyment that can lead to flow: (1) finding challenges that match skills, (2) being able to concentrate, (3) having a clear goal, (4) receiving immediate feedback, (5) finding release from the worries of everyday life, (6) having control over actions, (7) losing sense of time, and (8) losing self-consciousness (Csikszentmihalyi 1990, George 2007). Osterloh (2002) also provides evidence that programmers "often experience strong personal satisfaction from creating something that works". They suggest that where flow is achieved, contributions may function not as costs but as benefits.

The eighth element is particularly interesting, because the loss of self-consciousness is often accompanied by a feeling of "oneness with a greater union" (Csikszentmihalyi 1990). This point has special relevance to public goods as it indicates that participants achieve "flow" at least partially through group effort – lending support to the additional motivation of community identification (George 2007, see also 5.2.3.2).

A final example for the intrinsic activation of behaviour is Rebellion, which emerges as a will to emancipation. In the Hacker and Open Source Community, for instance, numerous studies have shown that this effect is prevalent. Those of the hackers who detest companies like Microsoft are driven by a motivation for emancipation from large software companies and proprietary software. Rebellion is also driven by the feeling that those companies do not represent their values, by not paying adequate attention to problems such as security and consumer well-being (George 2007). We will pick up this topic again in sections 5 and 6.

Returning to pro-social preferences, each of the following theories predict different behavioural patterns of individuals. The most pronounced behavioural hypothesis can be made about how people react to the behaviour of others.

2.2.2 Outcome-based Pro-social Preferences

Theories of pro-social preferences are based on the notion that people's utility functions are interdependent. Individuals do not only care about their self-interest, but also take the well-being of others into account. Following Meier (2004, 2006) there exist three different formulations of pro-social preferences, according to which the utility of others can either

1. influence one's utility directly (pure altruism theories, see section 2.2.2.1),
2. influence one's utility partly, because helping others produces a "warm glow" (impure altruism theories, see section 2.2.2.2), or
3. have an effect on one's utility that depends on the difference between one's own and another's well-being (theories of inequality aversion or equity, see section 2.2.2.4).

Put differently and in a bigger context, actions that are inconsistent with self-regarding preferences can be motivated by an agent's (unconditional) altruistic (subsections 2.2.2.1 - 2.2.2.3), inequality-averse (other-regarding) preferences (subsection 2.2.2.4), or by reciprocity (subsection 2.2.3). A wealth of formal models for these cases has been developed recently. Models of unconditional preferences include those of Fehr and Schmidt (1999) and Bolton and Ockenfels' (2000) inequality-aversion model. Further models include those of Charness and Rabin (2002) (a "distributional model"), and the Andreoni and Miller (2002) and Cox et al. (2006) altruism theories. Finally, models that incorporate reciprocity into preferences have been developed, amongst others, by Fischbacher and Gächter (2006), Camerer and Fehr (2006) and Cox et al. (2007, in press; also incorporating status). Let us shortly discuss these different formulations, beginning with the theories on pure altruism.

2.2.2.1 Pure Altruism

Altruism theories assume that other's consumption or utility positively affects an individual's own utility (e.g., Becker 1974). People contribute to a public good because they enjoy the well-being of others. Altruistic preferences are used to explain a wide range of pro-social behaviour: donations, volunteer-

ring and contributions in laboratory experiments like dictator games (Andreoni and Miller 2002, Eckel and Grossman 1996a, Meier 2004, p. 17). Altruism theories also assume that individuals enjoy seeing the well-being of others increase independently of the source of the improvement. This leads to the most important prediction offered by altruism models about the reaction of altruistic individuals to the contribution of others. According to Roberts (1984): People will contribute positive amounts to public goods, but their contributions are inversely related to the contributions of others. If other private individuals or the state contributes to the public good, people will reduce their contribution to the same extent.

This prediction of crowding-out individual's contribution by public grants, however, is still disputed in both theoretical considerations as well as in empirical results¹⁷). While some economists have even argued that the crowding out of intrinsic motivation constitutes one of the most important anomalies in economics (Frey 1997, Frey and Jegen 2001), some studies can measure effects, others can't. One probable explanation (not relying directly on altruism theories) is that, e.g., for the case of charity organizations, crowding out through government grants may not only crowd out private contributions due to donors' altruistic preferences, but they may also lower the incentive of charities to undertake fundraising activities¹⁸).

2.2.2.2 Impure Altruism and "Warm Glow"

Impure public good models are characterized by the presence of a commodity which jointly generates both private and public benefits (Cornes and Sandler 1984, Andreoni 1990, Frey and Meier 2004, amongst others). That is, a person who makes voluntary contributions to the provision of a public good may benefit both from the act of contributing per se,¹⁹ and from the total supply of the public good. In such models, individuals may not be solely motivated by pure altruism where they care only about the total amount of charitable giving. Individuals may also be motivated by the "warm-glow" of having contributed. Warm glow can therefore be understood as a willingness to contribute a certain constant amount independently of others' contributions. The warm glow effect has been identified to be significant by Andreoni (1990). The combination of both motivations is referred to as impure altruism (Temimi 2001, Fischbacher and Gächter 2006).

The literature above also indicates (esp. Andreoni 1989) that the propensity to contribute to public goods is greater when people also care about their donations per se. More specifically, the equilibrium level of charitable contributions in most of these impure public good models is higher than in pure public good models²⁰). The importance of higher overall contributions, however, is only important to the extent that it makes people better off. Cornes and Sandler (1996) point out that “policies that can increase public good supply and improve everyone’s well-being have desirable normative properties, and, as such, are more interesting than policies that just augment public good provision”. Temimi (2001) hypothesizes that since the introduction of warm-glow to preferences affects both the equilibrium level and the efficient level of public goods provision, it is not clear a priori whether warm-glow mitigates or exacerbates inefficiency and free-riding even if it leads to an increase in equilibrium contributions.

What we know empirically is that considerably less than half of all subjects show a significant positive warm glow-effect. Goeree et al. (2002) find more evidence for altruism than for warm glow and also report considerable individual heterogeneity with respect to altruism. Still, the models by Palfrey and Prisbey (1993) and Goeree et al. (2002) do not consider conditional cooperation, which – according to Fischbacher and Gächter (2006) – characterizes contribution preferences and behaviour of more than 50 percent of the subjects (Fischbacher and Gächter 2006, p. 28, we will address conditional cooperation in sections 2.2.3 ff.).

2.2.2.3 Some Notes on Altruism Models

To sum up some important things on theories of altruism: theories of altruism assume stable interdependent preferences. According to these theories, people will therefore exhibit stable behaviour in favour of others. However, this prediction is at odds with at least two empirical observations. Firstly, pro-social behaviour erodes with repetition (see empirics in subsection 6.2.1.3). Although in field studies this erosion may be less pronounced (e.g., Meier 2004), altruism theories are not able to explain the decay of pro-social behaviour. Secondly, people do not always behave pro-socially to increase the well-being of others. Sometimes they consciously reduce others’ utility by punishing their behaviour (see subsection 2.2.3.2), which is inconsistent with altruistic

preferences (Fehr and Gächter 2000a). To cope with these behavioural irregularities, we now examine models of inequality aversion, which focus on the relative well-being of subjects (Meier 2004, p. 20).

2.2.2.4 Inequality Aversion or Equity Models

An example for a central assumption in models of inequality aversion is that one’s relative standing in the income distribution is important. In other words, according to the models of Fehr and Schmidt (1999) and Bolton and Ockenfels (2000), people do not like inequality. In Bolton and Ockenfels’ theory of equity it is assumed that “along with the pecuniary payoff, individuals are motivated by a relative payoff, a measure of how the pecuniary payoff compares to that of other players”. Thus, inequality is particularly disturbing when a subject’s payoff is smaller than that of other subjects. Similarly, Fehr and Schmidt (1999) present a theory of inequality aversion. Their theory is based on the assumption that, to some extent, people dislike inequality in payoffs and they dislike inequality more if it is to their disadvantage than if it is to their advantage. Applied to the public good situation, as long as inequality-averse players believe that other players are contributing, they are willing to contribute, too (Keser and van Winden 2000). Such models also attempt to explain why, on the one hand, people behave altruistically towards others worse off than they are, while on the other hand they punish those who are better off than they are.

An illustrative example, standing for a bunch of similar results, Charness and Rabin (2002) let subjects in a number of simple games choose between an equal payoff (say, 50 : 50) and an unequal but often more efficient payoff (70 for the recipient and 30 for the dictator). The authors find “a strong degree of respect for social efficiency, tempered by concern for those well off” (p. 849). That is, the more unequal but socially efficient outcome is often chosen (Meier 2006, p. 7). These results bear important distributional implications for policy makers, which we will address in Part III.

For now, we’ll commence with theories that extend these equity models by assuming that people care about the well-being of others conditionally on their behaviour and intentions (Meier 2004, p. 20).

2.2.3 Reciprocity

Theories discussed up to now assume that people value only the distributional consequences of their own and others' behaviour. Theories of reciprocity add another dimension: people are also concerned about the intentions that lead other people to behavioural choices. When individuals act in a more cooperative way in response to the friendly behaviour of others, and in a hostile way in response to unfriendly behaviour, we call this reciprocity (see, e.g., Rabin 1993, Falk and Fischbacher 2001, Frey and Meier 2004, Meier 2004, Fischbacher and Gächter 2006, Camerer and Fehr 2006).

The reciprocity models have recently gained much attention and a substantial number of studies in experimental economics (e.g., Fehr and Gächter 2000, Cox et al. (in press) and Cox et al. 2006²¹) supplement the evidence by other social sciences indicating that reciprocity is an important factor in pro-social behaviour (for anthropology, see, e.g., Sahlins 1970). Ostrom (1998) lists five ingredients of reciprocity strategies that apply to social dilemmas:

- (1) identify who else is involved,
- (2) assess the likelihood that others are cooperators,
- (3) cooperate given that others can be trusted to cooperate,
- (4) do not cooperate with those who do not reciprocate, and
- (5) punish those who betray trust.

ad (1): In order to identify cooperators and potential defectors it is necessary that the behaviour of others can be monitored. This is sometimes possible in smaller communities. Unless earlier behaviour of those involved is known, people have to infer from a more general base of behaviour in society whether they can trust others to cooperate or not (2). This implies that the higher the proportion of people in society that act in a self-interested way there is in society, the less trust in one another and the less likely it is that positive reciprocity evolves (3). As for the fourth ingredient, cooperation rates should vary with the amount of contribution of others (4). Several experiments support this idea of conditional cooperation (discussed in detail in subsection 2.2.3.3).

Finally, as an outlook for the next subsections: reciprocity norms can be enforced by sanctions (see section 3.1.1.2; for a review, see Fehr and Fischbacher 2004). People may even be prepared to reward those who behave fair, punish those who behave unfair, despite they confer costs to themselves and gain no present or future material rewards. This latter kind of behaviour towards defectors is referred to as "strong reciprocity" (see 2.2.3.2) (Fehr et al. 2002) towards defectors is upheld by means of "altruistic punishment" (see 2.2.3.2 and 3.3 or Fehr and Gächter 2002, Biel and Thøgersen 2007).

As reciprocity relies on concepts of cooperation, and cooperation itself again on trust, bringing these concepts in line with one another, some deliberations on psychological foundations of cooperation are useful to start with.

2.2.3.1 The Psychology of Cooperation (or the Role of Trust)

Pruitt and Kimmel (1977), addressing the topic of cooperation from a psychological perspective, emphasize the role of trust. Their goal/expectation-theory suggests that most people recognize the need for trust to successfully establish cooperation. In order to achieve cooperation, the common goal "must be accompanied by an expectation that the other will cooperate" (Pruitt and Kimmel 1977, p. 375). About a decade later, Yamagishi (1986a) extended the goal/expectation-theory to the structural goal/expectation-theory. He argues that people are conditionally willing to cooperate in the sense Pruitt and Kimmel suggest. However, the opportunity to cooperate in a second order public good²², e.g., a sanctioning system will be utilized to establish trust necessary for durable cooperation. He provides experimental evidence that people, showing a lack of mutual trust, display uncooperative behaviour (relative to groups of rather trusting people) in the absence of a sanctioning system. The same people make relatively heavy use of punishment opportunities and achieve higher cooperation levels than their trusting counterparts when a sanctioning system is provided (Decker et al. 2002, p. 8).

2.2.3.2 Strong Reciprocity as cooperation-enhancing Behaviour (Punishment)

A person is called a strong (positive or negative) reciprocator if he/she is willing to re-ward fair behaviour and to punish unfair behaviour, even though this is often quite costly and provides no material benefit for the person (Gintis 2000, Fehr and Rockenbach 2003). Strong reciprocity has been observed in a wide range of social dilemma experiments, even in interactions with completely anonymous strangers (Fehr et al. 2002), and across different cultures (Henrich et al. 2001). If effective punishment opportunities are available, high levels of cooperation are achieved because the cooperative group members can discipline selfish subjects (Yamagishi 1986a, Fehr and Gächter 2000). In these punishment-experiments, subjects are given the possibility of reducing the other subjects' income at their own cost after having seen the others' contribution to the public good. These punishment possibilities are heavily used, and the lower an individual's contribution relative to the group average, the more the individual is punished. As a result, a large increase in cooperation is observed (see Figure 6 in the empirical part, or Fehr and Rockenbach 2003, p. 785).

2.2.3.3 Conditional Cooperation - (strong) Positive Reciprocity

Strong negative reciprocity has been mentioned in the last subsection. Strong positive reciprocity, which takes the form of „conditional cooperation“ (Fischbacher et al. 2001, Falk et al. 2003), is what we now turn to. Conditional cooperation means that a subject increases his or her contributions to a public good if he or she expects that other subjects will raise contributions as well. The existence of conditional cooperators renders the subjects' beliefs about other subjects' behaviour important. These beliefs can be based on past behaviour in a repeated interaction (Falk et al. 2003), but they can also be based on the knowledge that the members of the interacting group are “alike” (for recent experiments see Gächter and Thöni 2005, and section 6.2.1.4).

According to Offerman et al. (1996) who review the psychological literature, cooperators dislike being the “sucker” and adapt their preferred cooperative behaviour to selfish behaviour after a while, when they are confronted by selfish behaviour (Leanne Ma et al 2000, p. 2).

However although the punishment of free riders is a very effective device, the conclusion that (the threat of) punishment is always an adequate and successful instrument for governing social interactions is wrong. The threat of punishment can have detrimental effects on cooperation in (sequential) social dilemmas if punishment is not used to enforce a socially beneficial outcome but instead is applied to enforce a higher material payoff for the punisher (see figure 3, Fehr and Rockenbach 2003). This indicates that punishment is only powerful for enhancing cooperation if it is socially justified (Fehr and Rockenbach 2003, p. 786).

2.2.4 Self-Identity and Self-Image

In recent years, economists have recognized the importance of self-identity for behaviour (Akerlof and Kranton 2000). People not only care about their reputation with others but also want to have a good self-image. They therefore undertake certain activities – pro-social activities – in order to self-signal their “good traits” (Meier 2006, p. 12).

Bodner and Prelec (2003) and Bénabou and Tirole (2004) present two models in which self-identity is a crucial element in explaining pro-social behaviour. These models differ from outcome-based models in that people do not necessarily care about the outcome of a pro-social behaviour per se but instead care about how their behaviour affects their self-identity. Whether pro-social behaviour actually produces a good self-image thus depends on at least two factors: first, what is considered to be good action, and, second, in what circumstances a pro-social action is a valuable signal of one's good traits. Adam Smith (1776) described this motive for acting in a moral or unselfish way, in terms of individuals assessing their own behaviour through the eyes of an “impartial spectator”, an “ideal mate within the breast”:

“We endeavour to examine our own conduct as we imagine any other fair and impartial spectator would examine it. If, upon placing ourselves in his situation, we thoroughly enter into all the passions and motives which influenced it, we approve of it, by sympathy with the approbation of this supposed equitable judge. If otherwise, we enter into his disapprobation, and condemn it.”

In more contemporary terms, psychologists and sociologists describe people's behaviour as being influenced by a strong need to maintain conformity

between one's behaviour, or even feelings, and certain values, long-term goals or identities (Batson 1998, Knetsch 1992, Lamont 2000). Recent empirical studies confirm the importance of such self-image concerns and their contribution to pro-social behaviour.²³⁾ In particular, an experiment by Dana et al. (2003) reveals that when people are given the opportunity to remain ignorant of how their choices affect others or of their precise role in the outcome, many choose not to know and revert to selfish choices. Related to this, Murnighan et al. (2001) find that the fairness of offers in dictator games decreases significantly when the precision with which the offerers can split the cake is decreased, allowing them to construe the outcomes as largely outside their control²⁴⁾ (Benabou and Tirole 2004, p. 2-3).

Thus, what constitutes a good action is what the respective social norm defines. Managing self-identity therefore often means conforming to the social norm in one's reference group (see, e.g., Bernheim 1994). The results discussed above to the effect that people contribute to a public good conditional on other people's behaviour is therefore consistent with a theory based on self-identity. In order to fully understand why people behave pro-socially in one but not in the other situation, there is a need to develop models of pro-social behaviour that incorporate peoples' expectations of what is perceived to be appropriate (Meier 2006a, 2006b).

One way these expectations can be formed or influenced is the context in which a decision is made. As will be discussed later in more detail (section 2.2.6.2), the context crucially influences whether engaging in a pro-social activity in that it sends a needed or valuable signal that serves to retaining one's self-identity. A financial incentive to behave pro-socially might, for instance, make a signal less valuable. The (intended) pro-social action might not be attributed solely to one's good traits but might be seen as reflecting the influence of extrinsic motivation (Meier 2006a, p. 12). In short, the institutional environment, discussed next, might therefore have a huge impact on people's pro-social behaviour. The context might allow people to attribute the same decision to either a greedy or an altruistic trait, thereby affecting "how to decide" in the first place.

2.2.5 *The Institutional Environment (and Contextual Framing)*

For pro-social behaviour, the institutional environment within which people decide (to contribute time and money to public goods) is crucial (see, e.g., Ostrom 2000, Sobel 2002). The institutional environment can be defined as "the set of fundamental political, social and legal ground rules that establish the basis for production, exchange and distribution" (Davis and North 1971, p. 71, Meier 2004, p. 25). The institutional environment, which constitutes the context in which people decide, can matter even though the decisions remain the same in terms of material payoffs. This kind of context-dependent pro-social behaviour has been labelled institutional framing by Isaac et al. (1991).

The effect of contextual factors is supported by various experiments, where framing the same decision differently has a critical influence on decisions (see, e.g., Andreoni 1992, Sonnemans et al. 1998, Cookson 2000). Take, for instance, the example by Eckel and Grossmann (1996a), who used framing effects to change the focus of what is considered to be fair behaviour: whether people share \$10 that they have received as a gift, or, by contrast, that they had to earn does influence the generosity of the donor considerably. In Dictator Games between students, they observed an equal split of the total to be the norm for donors. When the same amount of money has to be shared with a charity, the amount given is on average much larger (Eckel and Grossmann 1996a, Meier 2004, p. 26).

Contextual factors in this respect influence the salience of a social norm. They are also able to change the social distance between individuals, as observations by Schelling (1968) confirm. Changes in the social distance are able to vary the empathy between people, which Schelling illustrated with his "identifiable victim effect", i.e., that people more likely decide to help a specific child in the Third World, than to support a project, which aims to improve the overall situation of children in poor countries (Meier 2004, p. 27).

To classify the institutional environment (from an experimental perspective), Meier (2004) discerns three different aspects, which substantially influence pro-social behaviour: (1) property rights, (2) in-group effects and (3) the communication between subjects.

(1) Property rights. The perception of what is considered a fair allocation is shaped greatly by the

way property rights are assigned (see Frey and Bohnet 1995, Gächter and Riedl 2003). Imagine the following situation with two different environments (related to the example above): you and a second person are supposed to earn € 1000. In the first setting, a jury will judge you upon delivered work in the extent of 100 hours, in setting two, the jury will – without having done any work – determine the winner who receives the prize with a lottery. Would you share the money with your partner? Probably only in the situation where you received the property rights by luck (as a gift without work). Thus, the way of assigning property rights changes the principles of what is perceived as a fair share (for what experiments on this issue have discovered, see section 5.2.3.5). Generally, empirical evidence suggests that less generosity can be expected when people attribute the received property rights to a variable that they can influence (e.g., effort). In contrast, when the assignment of a property is based on factors that cannot be influenced (e.g., luck), an equal sharing is perceived to be fairer (Konow 2000, Hoffman and Spitzer 1985).

A further finding in the research of assigning property rights is that the stronger the property rights that are assigned, the less likely individuals will be willing to share their wealth equally with others (Meier 2004, p. 28).

- (2) In-group effects. There is experimental evidence that people tend to cooperate more with their in-group-individuals (e.g., members of the same gang) than with individuals not part of their in-group, like members of other gangs (see, e.g., Kollock 1998). In other words: the institutional environment may shape the formation and salience of groups. The more equal and less fragmented a community is in terms of ethnicity and race, the greater is the acceptance of income redistribution (e.g., Luttmer 2001, see also sections 6.2.1.4 and 6.2.1.6). One reason for the higher contributions in in-groups may be that within a defined group, individuals have a biased perception about members of their own group and those of the out-group. In the case of redistribution, for instance, people may attribute the poverty of a group member to exogenous circumstances (such as bad luck), whereas a poor outcome for a non-group member tends to be attributed to poor personal characteristics²⁵⁾ (such as laziness). However, the tendency to help in-group members may also be due to various other reasons like reciprocity, soci-

al pressure or socio-biological motives (Meier 2004, p. 29).

- (3) Communication. Communication fulfils two important purposes. In laboratory experiments it has been found that after letting subjects talk (just for a few minutes), their expectations of others' cooperative behaviour increases significantly in accuracy (Frank et al. 1993b), given that the communication is face-to-face. If communication is only allowed indirectly (non-face-to-face, e.g., via computer), however, the effects on cooperation rates are smaller (Ostrom 2000).

Second, subjects use communication possibilities as an opportunity to ask others whether or not they want to contribute. Most subjects in experiments try to make agreements about mutual behaviour (see, e.g., Frey and Bohnet 1995). Even though such agreements (mostly, depending on the game design) cannot be enforced²⁶⁾, people seldom violate them. People seem to have a strong feeling to stick to their promises (Meier 2004, p. 29).

The institutional environment affects pro-social behaviour in various respects. It may be used by authorities to influence social preferences when they prescribe and enforce social norms (Rodriguez-Sikkert et al. (2007 in press, p.1)). There is, however, still insufficient understanding of “how a large array of contextual variables affects the processes of teaching, internalizing and evoking social norms; of informing participants about the behaviour of others and their adherence to social norms; and of rewarding those who use social norms, such as reciprocity, trust and fairness” (Ostrom 2000, p. 154, Meier 2004, p. 30).

In addition to the institutional arrangements to influence people's behaviour mentioned above, also monetary incentives can be implemented, which we now turn to.

2.2.6 Monetary Incentives and Pro-social Behaviour

From an economic point of view, people's pro-social behaviour should depend on the relative cost of behaving that way: The more expensive pro-social behaviour gets, the less it should be undertaken. Relative prices and incentives can be understood as important factors in the institutional environment

discussed above. In what follows, two contradictory effects of monetary incentives on pro-social behaviour are important: (1) according to the ordinary relative price effect, pro-social behaviour will increase when monetary incentives are provided; (2) in certain circumstances, monetary incentives may, however, decrease intrinsic motivation²⁷) to undertake the pro-social behaviour due to a motivational crowding-out effect (Frey 1997a, Meier 2004, p. 32). We'll commence with a short discussion of both effects.

2.2.6.1 Relative Prices of pro-social Behaviour

The hypothesis that people react to the (relative) price of giving has been analyzed in a substantive literature and proved by a solid empirical basis (see, e.g., Gates and Collins 2002). For instance, the research on price elasticities of charitable contributions with panel data studies indicate price elasticities in the range from -0.51 to -1.26 (Randolph 1995, Auten et al. 2002). In a study by Andreoni and Miller (2002), for example, they find that the elimination of tax deductibility for charitable contributions would increase the price of a unit of giving for a taxpayer formerly faced with a marginal tax rate of 30% from 0.7 to 1.0. Calculating the effect equivalently, charitable contributions would decrease between 15 and 36 percent²⁸) (Meier 2004, p. 33). However, the spectrum of situations in which monetary incentives matter for increasing pro-social behaviour is much wider than just tax deductibility for charitable contributions considered in the study mentioned so far. In many further situations, differences in relative prices explain a large degree of the variation in pro-social behaviour. For example, to increase environmental protection, monetary incentives are being considered or are already implemented (for an illustrative case see Diekmann 1995).

In sum, the research on price elasticities of charitable contributions and behaviour in various incentive situations supports the view that people react to changes in relative prices. However, many of the observed patterns cannot be explained by relative prices alone, and it is difficult to account for the level of pro-social behaviour, but, surprisingly, the introduction of the price mechanism in areas formerly based on purely voluntary contributions can backfire under certain conditions. This is the case when the motivational crowding-out effect dominates the relative price effect. The next section discusses the theoretical foundations of and the empirical evidence

for this motivational crowding-out effect (Meier 2004, p. 35).

2.2.6.2 Motivational Crowding-out

It is of considerable importance to pro-social behaviour that, in certain situations, a motivational crowding-out effect can work against the relative price effect (Frey 1997a, for a survey see Frey and Jegen 2001, Janssen and Mendys-Kamphorst 2004). This means that people who contribute to a public good in an anonymous situation must have an intrinsic motivation to do so, or, in other words, incentives may undermine or even crowd-out a motivation to behave pro-socially. Various experimental studies in psychology and economics have confirmed that (external) incentives have detrimental effects on intrinsic motivation (e.g., Deci et al. 1999). For instance, Gneezy and Rustichini (2000) found that the introduction of monetary incentives reduced the work motivation of volunteers. They observed that schoolchildren collecting donations for charitable organization, collected less money when they were given performance incentives. Frey and Goette (1999) show in an econometric study that while the size of an offered financial reward raises the number of working hours volunteered, the mere fact that financial compensation is provided significantly reduces the amount of volunteering (Meier 2004).

This is in line with the idea in Titmuss (1970), who argued that paying blood donors reduces supply (Benabou and Tirole 2004). Small extrinsic incentives are found to reduce the motivation of volunteers significantly, while the relative price effect dominates when large incentives are offered. According to Gneezy (2003), the relative price effect can be observed with negative incentives (fines) as well as with positive incentives (rewards). A further interesting finding on small incentives, particularly important in areas like volunteering, is that the reliance on extrinsic incentives may lead to a selection of certain "selfishly"-oriented people. Whereas for some tasks it is desirable to attract extrinsically motivated people (see, e.g., Lazear 2000), in other areas like the non-profit or charitable sector this is not very welcome (see, e.g., Besley and Ghatak 2003 and chapters 8 and 9).

Meier (2004) emphasizes that a motivational crowding-out is also expected if an external intervention (e.g., a law to prohibit something) is perceived as controlling. Psychologically, extrinsic incentives can have negative effects when they reduce the percei-

ved self-determination of individuals (Rotter 1966, Deci 1975), or when they interfere with a relationship based on mutual trust (Rousseau 1995). As self-determination and trust are important for pro-social behaviour, the introduction of external incentives can seriously reduce the intrinsic joy of behaving pro-socially. Benabou and Tirole (2004, p. 2-3) emphasize another reason for crowding-out in conjunction with norm-enforcement mechanisms that is based on a very simple intuition: the presence of rewards or punishments spoils the reputational (or self-reputational) value of good deeds, creating doubt as to the extent to which they were performed for the incentives rather than for themselves. This effect is in line with what psychologists refer to as the “overjustification effect” (e.g., Lepper et al. 1973).

However, if extrinsic incentives are applied carefully, e.g., acknowledging individuals’ intrinsic motivation, they may not be perceived as hostile and controlling, and can even support and increase pro-social behaviour (a crowding-in effect, see also Meier 2004, p. 39). Important also is that what one individual may perceive as hostile may not be the case for another. This brings us to a further topic that should be reflected by sophisticated models of pro-social behaviour: individual differences in motivations, that is, heterogeneity within individuals.

2.2.7 *Heterogeneity (with)in Individuals (Types of Agents)*

While psychologists for decades have distinguished individual motivations using survey answers, economists for a long time did not control for types of individuals (such as ethnicity, gender or educational backgrounds) when testing economic decision theory. They use(d) the most common inhabitant of economic models, Homo Oeconomicus, as strictly rational agent without sex, age or a cultural identity. As a consequence, there may have been a bias in the interpretation of experimental data.

Psychologists, in contrast, typically classify people into four types: altruists, competitors (who want to do better than their counterparts), cooperators (who pursue the best for themselves and the others, in economics labelled as altruists) and individualists (egoists) (see, e.g., McClintock 1972, Kelley and Stahelski 1970, Meier 2004). Experimental research (conducted throughout the last decade) indicates a high degree of heterogeneity in people’s cooperation

preferences as well as actual contributions²⁹). Fischbacher and Gächter (2006) find in the laboratory that there are types of players in the sense that expressed cooperation preferences and actual contributions are largely consistent with each other. This holds in particular for conditional cooperators (see subsection 2.2.3.3). According to these authors, free riders show the most systematic deviation from their expressed cooperation preferences in the first half of repetitions of the experiment, which is likely due to a (misplaced) strategic attempt to induce others to contribute more. However, in the second half of the experiment, actual contributions are strongly consistent with predicted contributions. Second, the interaction between heterogeneously motivated types explains the decay often observed in contributions to the public good (see Figure 6, p. 81). This effect is “quantitatively important and vindicates previous speculative arguments by Fehr and Fischbacher (2004) that cooperation is fragile due to preference heterogeneity” (Fischbacher and Gächter 2006, p. 31).

As will turn out throughout the results within the next chapters, this topic is of major importance and it will reoccur in sections 5.2.2, 6.2.2.7, and 7.1. For now we turn to a synthesis and comparison of the aforementioned models of social preferences and their appropriateness in the ability to explain different pro-social behaviour.

2.2.8 *Appropriateness of different Theories of pro-social Behaviour*

Within this chapter (2.2) various concepts and theories on pro-social behaviour have been presented. Obviously, a number of important phenomena and puzzles cannot be explained by the sole presence of individuals with other-regarding preferences. First, providing rewards and punishments in order to increase pro-social behaviour sometimes has a perverse effect, reducing the total contribution provided by agents. The crowding-out of intrinsic motivation by extrinsic incentives has been observed in a wide range of situations: in the realms of social interactions, the provision of public goods, tax compliance, volunteering, and experimental labour contracts (see subsection 2.2.6.2).

Second, people commonly perform good deeds and restrain from selfish ones because of social pressure and norms (addressed in the next chapter 3) that attach honour to the former and shame to the latter

(e.g., Batson 1998, Freeman 1997, Benabou and Tirole 2004). Studies in section 2.1 indicate that charitable and non-profit institutions make ample use of donors' desire to publicly demonstrate their generosity and selflessness (or at least the appearance thereof): means and symbols in order to achieve this range from "supported by"-placards in opera houses or buildings named after large contributors. The presence of a social signalling motive for giving, as distinct from pure altruism, is also evident in the fact that anonymous donations are both extremely rare—typically, less than 1 percent of the total number³⁰—and widely considered to be the most admirable. Conversely, showing off one's generous contributions is largely senseless. Benabou and Tirole (2004) mention "codes of honour, whose stringency and scope varies considerably across time and societies are another example of norms enforced largely through feelings of shame (losing face) or glory, leading individuals to engage in self-sacrifice for reputational reasons. To understand these mechanisms it is again important to not posit exogenous social constraints, but rather to model the inferences involved in sustaining such norms and the external factors facilitating or inhibiting them" (Benabou and Tirole 2004).

Meier (2004, p. 30-32) reports on a number of experimental studies that attempt to discriminate between the various theories of pro-social behaviour (see Fehr and Schmidt 2003), in which the results are mixed with regard to which model best explains such behaviour. While, for example, reciprocity models are shown to explain behaviour in various public good situations, in other situations, e.g., Dictator Games, pro-social behaviour cannot be due to reciprocity. Similarly, some experiments show that people are motivated by inequality aversion, while others support the notion that people are concerned with overall efficiency, independent of equality. Meier argues that it is too early to conclude whether one theory is most appropriate to explain pro-social behaviour (p. 30). In the second part, therefore, further evidence on pro-social behaviour in laboratory (and natural occurring settings, when possible) is presented, which should shed further light on what motivates people to behave pro-socially.

We will revive this topic again in the summary (section 7.2). The next chapter on social norms shall narrow the focus on which conditions may trigger the various motives for pro-social behaviour.

3 Social Norms

In this chapter we review social dilemma research with a focus on social norms³¹, the influence of norms on cooperation, their relevance for behaviour, and which kinds of norms (sub-sections 3.1 and 3.2) are likely to be activated under different dilemma situations³². By digging further into the foundations of pro-social behaviour in analyzing social norms, the interactions between intrinsic, extrinsic and reputational motives for pro-social behaviour, we will put the concepts of reciprocity (sections 2.2.3 in general), conditional cooperation (see 2.2.3.3) and punishment (see 2.2.3.2) into a bigger context.

What are social norms?

Social norms are normative standards of behaviour that are enforced by informal social sanctions. The Public Goods Game with a punishment opportunity can be viewed as the paradigmatic example for the enforcement of a social norm (see section 2.2.3.2). Social norms often demand that people give up private benefits to achieve some other common goal. In particular, they arise when individual actions cause negative side effects for others (Coleman 1990), and they serve the function of restricting egoistic impulses in favour of collective outcomes (Biel et al. 1999). This raises the question of why roughly half of the individuals in a dilemma situation obey the norm (and contribute). Experimental evidence (see section 5.2.4) suggests an answer: Some players will punish those who do not obey the norm (sometimes even at a cost to themselves), which enforces the norm (Camerer and Fehr 2002, p. 13).

Social norms thus evolve to regulate social life. In other words, social norms imply that (certain) people should manifest a prescribed behaviour or not manifest a proscribed behaviour, because violating prescribed behaviour is met by sanctions. Social norms may become internalised, in which case sanctions (e.g., in the form of guilt feelings or pride) "... are administered by the individual him- or herself. Internalized norms are called personal norms" (Schwartz 1977, Schwartz and Howard 1982, citing Biel and Thøgersen 2007). As defined by Cialdini and Trost (1998, p. 152):

"Social norms are rules and standards that are understood by members of a group, and that guide and/or constrain social behaviour without the force of laws.

Furthermore, social norms are often guiding behaviour in specific contexts, and many times they need to be activated. Such an activation process is .. more often than not .. unconscious, it does not involve much thinking or even a choice on the part of subjects and .. once .. activated, it will show some inertia, in the sense that unless a major change in circumstances occurs, people will keep following the norm that has been primed” (Bicchieri 2002, p. 198).

We will address two types of norms in the course of this chapter: general interaction norms and benevolence norms. General interaction norms provide rules of interaction and exchange (Kerr 1995). Their notion is based on shared beliefs about how people ought to behave in a given situation. The difference between those two norms is that while general interaction norms promote group members’ welfare indirectly, benevolence norms prescribe behaviour that benefits others directly. Benevolence norms are private and internalised prescriptive norms. These norms are activated especially when individuals believe that important values are threatened (e.g., Stern et al. 1999). Here, sanctions and rewards are initiated by the individual him- or herself only.

3.1 General Interaction Norms

3.1.1 Norms elicited by the Behaviour of Others (Reciprocity)

In any decision situation, an individual will search for cues to interpret and analyze the situation. This is often intuitively done with a mentally stored “well-known schema”. Once a situation is categorized as fitting a particular schema, behavioural norms and role expectations will be elicited (see Bettenhausen and Murnighan 1991).

The question is then: which cues will elicit which schemas? Putting it in the social dilemma context, seeing others contribute would require one to cooperate in kind as well, which we already discussed as the norm of reciprocity. Before we turn to reciprocity, the consistency norm and norms about fairness (inequality-aversion or equity) will be briefly discussed.

Consistent Commitment and Fairness

Above, the importance of communication for cooperation has been emphasized (section 2.2.5). Kerr (1995) suggested that communication in groups elicit a commitment norm. This implies that once people have committed themselves to a course of action, they are expected and likely to act consistently (Cialdini 2001). The study by Orbell et al. (1988) found a strong relationship between commitment and cooperation rates, underlining the importance of this principle in social dilemma research. The actual proportion of cooperators in this study was high to the extent that group members in the discussion groups promised to cooperate. Similarly, did they promise to defect, they also defected.

Distributive Justice and Equity

Following Kerr (1995), free riding means violating the norm of equity (see “inequality aversion” in subsection 2.2.2.4). Some kind of effort (input) should be contributed in order to receive something from a public good. Again, if group members experience that inequity exists in a resource dilemma, those that are treated wrongly are prepared to take action (Allison and Messick 1990). In questions concerning social welfare, studies show that if people perceive resources to be distributed in a fair manner, they are also willing to contribute to the resource (Biel et al. 1999, Eek and Biel 2003). Additionally, people who are better off contribute more than people with smaller endowments do. Taken together, Biel and Thøgersen (2007) conclude that

“Norms for distributive justice seem to have a double entrance. Once a decision situation is recognised as a social dilemma, norms about fair contributions and distribution tend to be elicited. These norms may differ depending on which particular situation people are in and which goals they wish to pursue. This is a further indication that norms act as default social rules in social dilemmas. Elicited norms are then matched or evaluated with regard to people’s actual behaviour. If people perceive that fairness is upheld, they tend to contribute to the common good or refrain from overusing a common resource. If not, they are prepared to punish others for their defective behaviour, or refrain from contributing themselves.” (p. 97-98).

Reciprocity

Not only justice motives do concern one's own contributions or behaviour in social dilemmas, but also the behaviour of others. When others treat us kindly, we in turn treat them kindly and call it reciprocity. Reciprocity is part of every one's experience in daily social interactions (we discussed this in section 2.2.3). We will now look at three (sociological) theories that have been proposed to explain reciprocal behaviour. First, equity theory suggests that "people aim to equalize the ratio of inputs to outcomes in social interactions" (e.g., Adams 1963, different to the explanation given above).

Second, according to social exchange theory, people are kind to others for purely selfish reasons, e.g., they want the recipient to become obliged to return the favour at some later time, to gain friendship, to impress others, or they hope to gain social approval and social acceptance (e.g., Blau 1964, Homans 1961). This links "pure" pro-social behaviour with what we discussed as "impure" pro-social behaviour in sections 2.1 ff). To summarize, according to social exchange theory, it is a social norm that one should reciprocate, i.e., a norm which is anchored in social groups and sustained by peoples' anticipation of social sanctions when violating this norm (Gouldner 1960). Related to social exchange theory is also the notion of "reciprocal altruism" (Trivers 1971), according to which individuals aim to build a reputation to reciprocate. A "reciprocal altruist" thus reciprocates only if this generates future rewards (Grossmann 2002, p. 276-272).

3.1.1.1 Social Approval or Disapproval – Rewards and Punishment

As discussed in the last section, social interactions are frequently associated with social approval or disapproval. We now address the economic consequences that such social rewards and punishments may imply. Examples lie in the efficiency of teamwork or decisions in diverse areas such as tax evasion, exploitation of the welfare state, criminal activities or voting behaviour³³). Prime examples of rewards are the exchange of social rewards like the admiration or the contempt that is sometimes expressed by parents, teachers or professional colleagues. Common ground to all rewards or sanctions are that social rewards are not based on explicit contractual arrangements but are triggered by spontaneous posi-

tive or negative emotions which can be interpreted as approval and disapproval, respectively (Gächter and Fehr 1999).

The desire for social approval, i.e., actions yielding a positive image, implies that people will act more generously and pro-socially in public than in private settings. A number of field and laboratory studies have found such a pattern (e.g., Andreoni and Petrie 2004, Rege and Telle 2004, Soetevent 2005). This may explain why many organizations make individuals' contributions explicitly visible to others by having charity events, posting lists of donors in newspapers and publicizing amounts donated (Ariely et al. 2007, p. 3).

Casual evidence suggests that social approval and disapproval play an important role in collective action. For example, in Japanese-managed automotive factories in North America (transplants), team production (teamwork) is the norm and peer pressure against absenteeism or tardiness is substantial. Rehder (1990, p. 91) reports that "the entire team suffers when one person is absent, and the returning team member can receive both formal sanctions and informal group pressures upon this or her return. The system is designed to function that way, and it works very well".

Falk and Fehr favour a further finding put forward by Adam Smith (p. 23): "We expect less sympathy from a common acquaintance than from a friend... We expect still less sympathy from an assembly of strangers" and conclude that since the social distance among people is likely to be smaller the more often they interact with each other, the repeatedness of interactions is positively correlated with the importance of approval incentives. However, the repeatedness of interactions also is positively correlated with the importance of pecuniary punishment opportunities (p. 341-342).

With regard to the conditions under which approval incentives have behavioural effects, Gächter and Fehr (1999) find the following:

"Social approval has a rather weak and insignificant positive effect on participation in collective actions if subjects are complete strangers. Yet, if the social distance between subjects is somewhat reduced by allowing the creation of a group identity and of forming weak social ties, approval incentives give rise to a large and significant reduction in free-riding. It seems that group identity is like a "lubricant" that makes social exchange effective.. and .. the interaction between social distance, or the degree of familiarity, respectively, and the effectiveness of approval

incentives suggests that approval incentives are the more important the greater the density of social interaction among people. The interaction effect also suggests that changes in a society's social structure that diminish the density of social interactions are likely to increase free-riding." (p. 361-362). Empirical findings linked to these aspects will be discussed in section 6.2.1.4.

3.1.1.2 Norm Enforcement (Emotions and Disutility)

In order to get a better understanding of social norms, studying underlying enforcement mechanisms could prove helpful. Generally, norms are enforced by punishment when commonly concerted behavioural standards are violated or endangered. Influential social scientists (Elster 1989, Frank 1988, Hirshleifer 1987) have argued that mechanisms underlying sanctioning (enforcing a social norm) stand on strong emotions as primary drivers of norm enforcement decisions (Fehr and Fischbacher 2004). Moreover, Elster (1989) argued that being the object of negative emotions, such as anger, causes a large disutility on its own, independent of any material losses. For decisions (whether cooperation or defection), anticipating which emotions are triggered by one's own behaviour may therefore be of prime interest.

3.1.2 Norms elicited by the Situation

People are not only receptive to the behaviour of others, also the situations that people encounter may vary with regard to which particular norm is evoked. Deutsch (1975, 1985) proposed in his work on distributive justice that there is a match between principles of distributive justice and the goals that people wish to achieve. If personal development and well-being is the primary goal, "an allocation based on relative need should manifest itself, whereas if a group is oriented towards economic productivity, it should embrace an allocation norm that encourages efficiency and distribute resources based on past contributions, in short: equity".

Different behaviour and decisions in the business sphere compared to the policy sphere

Lane (1986) has pointed at differences between the market and the policy sphere. While equality is expected to be a prime norm in a policy sphere, equity is often adhered to in market situations. The various situation-based approaches generally have in common the emphasis that different norms of conduct are expected to be elicited in business and in policy. Lane also makes a distinction between fairness, as a criterion for allocation, and justice, referring to the outcome of the process. Connecting this to the sequential model of justice (Schroeder et al. 2003), different social norms are expected to be appropriate in the business and the policy frame. In the market, people would be concerned about equity as a fairness principle. In the policy sphere, not only must procedures be fair, outcomes must also be just. Distributive justice thus mainly is measured against the norms of equality and need (Biel and Thøgersen 2007). Further evidence and policy implications, confirming the latter aspects, i.e., the dependence of behaviour on the neediness of recipients, will be presented in chapters 9 and 10.

In a study on social norms and cooperation, for example, Pillutla and Chen (1999) predicted that people would behave more competitively in dilemmas involving economic as compared to non-economic decisions. Given that self-interested behaviour is the implicit norm in an economic context, people are more likely to defect than in a non-economic context. The economic decision concerned investing in a joint investment fund, while the non-economic decision involved a contribution to a social fund. Results supported their hypothesis. Furthermore, participants expected larger contributions (i.e., cooperation) in the non-economic than in the economic context. This on the one hand underlines the importance of framing-effects (the contextual, e.g., environmental setting where decisions take place) we mentioned in section 2.2.5, and on the other hand bears important implications for (game) mechanism designers to rule out unwanted contextual implications (we will discuss methodological traps in section 6.1).

The essence of these studies is to show that in the business domain different social norms may guide behaviour than in policy or private domains. The behavioural effects when a norm is adopted which was framed in a business setting implies that people adhere to calculating costs and benefits for themself-

ves, while at the same time paying less attention to ethical aspects. As a result, the tendency to cooperate declines. This should not be interpreted such that social norms are absent in economic settings, however, the norm of reciprocity is pervasive (Wenzel 2004).

3.2 Benevolence Norms

Benevolence might also account for individual's choice for cooperation. When specifying the norm of benevolence, Kerr (1995, 1996) mentions the norm of social responsibility (Berko-witz 1972) and the norm of in-group favouritism (Tajfel 1981). Biel and Thøgersen (2007) use the term 'benevolence' in a broader sense, including actions aiming to preserve and enhance the welfare of people as well as actions where the goal is to benefit all people and nature (termed universalism by Schwartz (1992)). It is assumed that these and other benevolence values are activated by situational cues suggesting a discrepancy between the actual and a desired state (Schwartz and Howard 1984), in short, by a need for action. This need for action may then activate a feeling of moral obligation that they term personal norms. They refer to Verplanken and Holland (2002), who, in an experiment involving manipulations to prime benevolence values, found that cooperation increased when values relevant for such behaviour were primed, hence supporting the assumption that benevolence values are not necessarily chronically accessible in people, but may need to be activated.

Benevolence, visual proximity, and the identifiable victim effect

As research on "bystander helping" in emergency cases indicates, the likelihood of helping depends on a person's visual proximity to the victim (Piliavin and Piliavin 1973, cited in Schwartz and Howard 1984) and on how clearly the need for help is spelled out (Schwartz 1970). Related to visual proximity is the literature on the identifiable victim effect. Studies analyzing charitable giving could confirm a positive correlation between giving-behaviour and an identifiable addressee. When a specific child in the third world was addressed as recipient giving was higher than when fundraising was subjected to improve the situation in general (Meier 2006).

The valence of situational cues also seems to play a role. Activating a personal norm, for in-stance, has been found in a social dilemma context more likely for a "hurt" frame (i.e., one that makes salient that defection leads to negative consequences) than a "help" frame (i.e., one that makes salient that cooperation leads to positive consequences) to elicit cooperation (e.g., Kerr and Kaufman-Gilliland 1997). This finding is consistent with other research, which has found that negative information (e.g., information about a negative event, such as an accident) is more likely to catch attention than positive information (Carretie et al. 2001) and that negative information influences peoples' evaluations more than comparable positive information (e.g., Grankvist et al. 2004, Ito et al. 1998). Finally, for the activation of benevolence values to be transformed into a personal norm for a particular behaviour, awareness of a need for action is necessary as well (Schwartz and Howard (1982, 1984), Biel and Thøgersen 2007).

3.3 Implications

Social norms play a decisive role for cooperation in social dilemmas. Confronted with a social dilemma, a large share of the population – experimental results indicate about 50% – spontaneously intends to cooperate. Cooperation is consistent with their moral values and when they perceive a need for action, knowing what to do, and feeling able to do it, they feel a personal obligation to act accordingly. Hence, they form a personal norm for cooperation in the specific situation. Put differently, what makes a given behaviour socially or morally unacceptable is often the very fact that "it is just not done", meaning that "only people whose extreme types make them social outliers would not be dissuaded by the intense shame attached to it" (Benabou and Tirole 2004). In other situations different norms or codes of honour prevail, and the fact that "everyone does it" allows the very same behaviour to be free of all stigma³⁴.

In social dilemma research, this individual variation in value priorities is often conceptualized as different social value orientations (SVO) with regard to the distribution of a common resource (Messick and McClintock 1968). Some people have a cooperative social value orientation (usually referred to as pro-socials). For pro-socials, equal distribution is a fundamental goal and equality is a highly prioritized value. The opposite is built on an individualistic or competitive orientation (pro-selfs). They are guided by goals such as individual achievement and wealth,

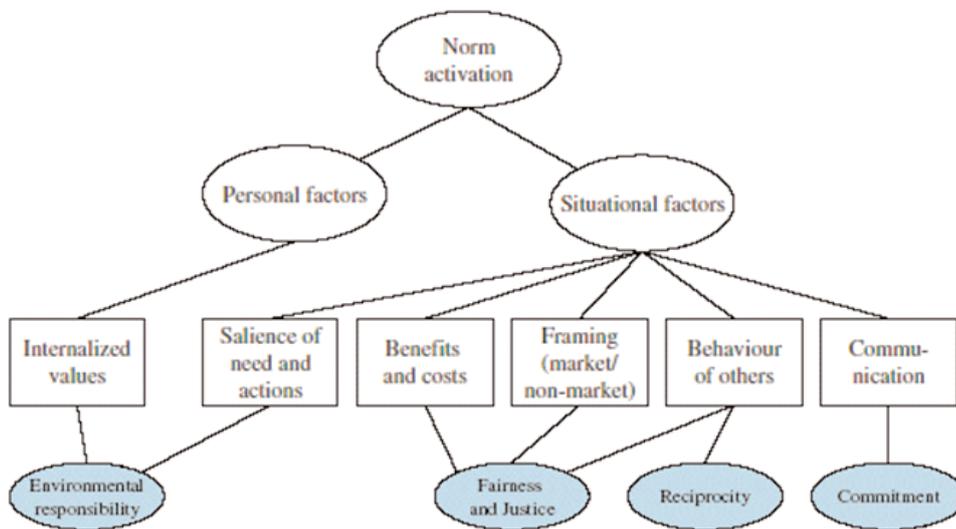
and achievement and power are among their highly prioritized values.

Biel and Thøgersen (2007) summarize that both personal and situational factors are relevant for the activation of norms in social dilemmas, whereas personal and situational factors are linked to a somewhat different pattern of norm activation (Figure 4). The most distinctive feature is that situational factors, including the behaviour of others, are associated with norms related to cooperation, whereas personal factors are associated with felt obligation to protect some endangered thing (i.e., a norm of environmental responsibility). Such situational activated personal (benevolence) norms can explain the widespread deviation from rationality, reflected in a base-rate cooperation of about 50% in one-shot social dilemmas and even one-sided offers in ‘ultimatum bargaining’ situations³⁵) rejected even when the probability of a repeated encounter is unimportant (Kahneman et al. 1986, Thaler 1988, Frank 1988).

norm-guided behaviour can be stable in a well defined sense against “invasion” by self-interested types and, thus, is of considerable practical importance. Both in controlled laboratory environments and in the real world, people are frequently observed incurring material losses to uphold norms of fairness, reciprocity, vengeance, and cooperation. Lost wallets are returned, anonymous charitable contributions are made or tips are given to taxi drivers or in restaurants. Even more powerful, when people observe inequality, they are willing to enforce distribution and cooperation even if they are uninvolved (a third party). Knowing that they incur costs and yield no economic benefit they sanction the norm violators (Fehr and Fischbacher 2004, p. 64-65, see also section 5.2.4.1).

Experimental results and empirical studies documenting such practices can thus be explained by an appeal to the fact that human behaviour is guided in part by an adherence to social norms which serve to temper and restrain self-interest (Sethi 1996, p. 115-116).

Figure 4 - Factors influencing the Activation of Norms in Social Dilemmas.



Source: Biel and Thøgersen 2007, p. 107)

Aside from being of theoretical interest, the empirical results presented in Part II strongly indicate that

4 A short Summary up to this Point

From what has been discussed up to here, there are good and bad news in terms of implications for economic theory. According to Meier (2004), the good news that people behave pro-socially is bad news for orthodox economists, who are reluctant to accept that standard economic theory is limited and sometimes purely wrong in predicting behaviour³⁶). Rational choice models are based on the assumption that humans strictly maximize their material self-interest. This hypothesis is a convenient simplification and there are, doubtless, many situations in which almost all people behave as if they were strictly self-interested. Fehr emphasizes that for comparative static predictions of aggregate behaviour self-interest models make empirically correct predictions because according to models with more complex motivational assumptions, they predict the same outcome (Fehr and Fischbacher 2002). However, evidence discussed above also shows that fundamental issues in economics cannot be understood on the basis of the self-interest model, i.e., in explaining pro-social behaviour. The important analytical step forward is therefore to isolate the conditions which lead to more and to less pro-social or selfish behaviour (Part II). Psychologists have studied pro-social behaviour for quite a long time. Consequently, a large number of economic theories on pro-sociality have evolved to explain people's pro-social behaviour and the variation in their respective behaviour.

Before turning to some empirical results, let us sum up which of them were most important as a variety of approaches exists that are designed to separate between different motives for cooperation and defection. It has been tried to explain pro-social behaviour by introducing elements of altruism, fairness and/or reciprocity into people's considerations, mostly by incorporating additional terms into their preferences. However, according to Meier (2004), all the approaches presented in the theoretical part can be classified into three groups:

- (1) those which emphasize the distributional outcome (e.g., pro-social preferences),
- (2) those which highlight the importance of the process that leads to a certain outcome (e.g., involved people's intentions, i.e., reciprocity), and
- (3) those which focus on the significance of the institutional environment for pro-social behaviour.

As the empirical part will confirm, predictions about peoples' reactions to the pro-social behaviour of others differ quite substantially amongst the different theoretical approaches. While, for instance, altruism theories predict that people will decrease their contributions to a public good if other persons or the state increases their share, theories of conditional cooperation make exactly the opposite prediction. And, as a second anticipation to the empirical part, there is, so far, very rare field evidence clarifying which of the two theories is better able to explain human behaviour (Meier 2006). This is worth mentioning not only because the theoretical approaches and respective (still few) empirical hints given in the previous chapters may have indicated that it is still too early to make conclusive statements about the importance of the various pro-social motivations. However, the survey probably indicates that many interesting insights can be gained from economics research on pro-social behaviour.

What can be considered as the essence of all approaches that have been presented here, and where consent among researchers exists, is that

1. a substantial number of people are prepared to act in a pro-social way in an anonymous situation in which no direct enforcement mechanism exists.
2. expectations about the contributions of other people matter. The more people expect others to cooperate, the more they cooperate themselves (conditional cooperation).
3. the environment in which decisions take place matters. In particular, it is essential that people are asked to contribute in a way they conceive to be acceptable. Pro-social behaviour heavily depends on environmental and institutional conditions (framing effects).
4. people differ in their (pro-social) attitudes (i.e., there is heterogeneity in individuals).
5. collective punishment rules are able to bring about stronger cooperation and people are ready to punish if they feel unfairly treated;
 - a. If punishment mechanisms are allowed, the average economic decision-maker will, at some personal cost, punish free riders who reduce the social efficiency of group interactions.
 - b. People react to price and income changes when they consider punishing free riders (just as they react to changes in these variables when they

consume standard commodities³⁷); price elasticities are very low, however).

c. Despite the relative inelasticity of the demand for punishment, punishers are sensitive to the price of punishment but not sensitive to income changes that should allow one to punish more severely³⁸).

Some detailing comments on each finding, following Meier (2004, 2006), Fehr and Rockenbach (2004) and Carpenter (2007):

ad 1) The stylized facts emerging from this type of experiment are that contributions to the group account exceed the standard economic prediction of zero (empirically), but are substantially below the socially optimal level of 100 percent contributions. Initially, contributions to the group account close to 50% of the endowment are observed in PGGs with one-shot interactions. However, cooperation is rarely stable if the game is played repeatedly (given that no possibility to punishment exists), and deteriorates to rather low levels towards the end of the interaction period (see, e.g., Walker and Halloran 2004, Fehr and Rockenbach 2004, and section 5.1.2).

ad 2) Participants react to the allocations of their counterparts (either previous or current). Thus, if others contribute to the public good you want to contribute, while if others free-ride you want to keep your endowment for your private consumption. The vast literature (see, e.g., Charness and Levine (2003) and the references therein) emphasizes the importance of intentions behind another parties' actions for reciprocity.

ad 3) On the one hand, the institutional environment affects the salience of particular social norms, as well as the intrinsic motivation to behave pro-socially. On the other hand, it influences the social interaction between (egoistic and altruistic) individuals, as in how the violation of a social norm can be punished. Another institutional mechanism that causes strong increases in cooperation is communication (Sally 1995, Camerer and Fehr (2002, p. 13), and section 5.1.3). If the group members can communicate with each other, the unravelling of cooperation frequently does not occur. Communication allows the conditional cooperators to coordinate on the cooperative outcome and it may also create a sense of group identity (see also 6.2.1.4).

ad 4) Experimental research indicates that there is a high degree of heterogeneity in peoples' cooperation preferences as well as actual contributions (see section 5.2.2). This is of considerable importance, as

neoclassical economics traditionally assumes preferences to be homogeneous and neglecting heterogeneity bears important consequences in not understanding actual contributions-behaviour. Fischbacher and Gächter (2006), for instance, provide evidence that expressed cooperation preferences and actual contributions are largely consistent with each other. Fischbacher et al. (2001) find in a public-good game that 30 percent of the individuals behave like free riders and 50 percent can be characterized as conditional cooperators. The implications of this heterogeneity are discussed in detail in the summary (p. 119ff).

ad 5) If the institutional setting allows for the sanctioning of free-riders, such as when the group is small and free-riders can be targeted, high levels of contributions can be achieved. Consent among researchers exists that collective punishment rules are able to bring about stronger cooperation. But will participants agree to submit themselves to a collective rule, even if this means to give up some individual freedom? If so, which rule is preferred? Experimental results suggest that the more severe an institution is the higher is the contribution to the public good but the lower is the willingness of subjects to accept this institution³⁹) (Decker et al. 2002).

In other words, and from a more psychological perspective, pro-social actions are undertaken both because a certain fraction of individuals are genuinely other-regarding, and due to the fact that, in many cases:

- people want to signal to others that they are generous, fair, public-spirited, courageous, etc. Pro-social behaviour is then part of a general quest for social esteem;
- people strive to maintain a certain view of "what kind of a person" they are.

To set stage for the second part, it is therefore important to better understand which conditions exactly trigger those above motives, such as whether conditional cooperation is sensitive to group size, and whether people care only for their reference group. It is conceivable that people do not care how many individuals contribute, e.g., to charity events in total, but that they do care whether their reference group does (Meier 2006).

5 Behavioural Experiments – Analyzing (recent) Experimental Findings

The theoretical part has surveyed different behavioural theories and derived initial “predictions” for their likely directions and effects. These predicted hypotheses along with their variations will now (in Part II) be confronted with existing empirical evidence with a focus on conditions (motives) which affect the willingness to contribute money and time to public goods.

We will proceed as follows. To get a first clue about the extent and impact of different behavioural patterns on the provision of public goods, we will examine some important early experiments that have laid the foundations for much that had followed and found empirically first (in section 5.1). There is some redundancy to section 4; however, it is enriched by a chronological perspective and quantitative figures.

Section 5.2 will make the current state of research a subject of discussion and emphasize reciprocity (section 5.2.1), the institutional environment (section 5.2.3) and crowding-out effects (section 5.2.5).

5.1 Major (robust) Findings up to the mid-1990s – a first (chronological) Approach

Ledyard’s survey (from 1995) lists 33 references of the three most influencing working groups⁴⁰ that have contributed to our understanding whether and why cooperation might occur in social dilemma situations (Ledyard 1995, p. 13). At the theoretical level, economists (e.g., Lindahl 1919 or Samuelson 1954) have long recognized the public good problem itself. Political scientists recognized it as a problem of collective action (Olson 1965) and as the tragedy of commons (Hardin 1968), while social psychologists called it a social dilemma (Dawes 1980). Nevertheless, even though the problem was widely recognized, there were few data. This allowed wide disagreement about whether there really was a problem. Marwell et al. (as economists) assumed and tried to demonstrate that “the effects of free-riding were much weaker than would be predicted from most economic theory” (Dawes et al. 1977, p.5, Ledyard 1995, p. 22). However, let us start with four early robust (qualitative) findings that are agreed upon

throughout the disciplines and incommensurable test designs:

1. In one-shot trials (no repetitions of a game) and in the initial stages of finitely re-peated trials, subjects generally provide contributions halfway between the socially optimal level (i.e., 100 % contributions) and the free riding level,
2. Contributions decline with repetition,
3. Face to face communication improves the rate of contribution, and
4. Cooperation improves when marginal payoffs for contributing are increased (Isaac et al. 1984, 1991).

Let us briefly discuss these findings.

5.1.1 *Subjects contribute roughly half of their Endowment*

Over the years, experiments on one-shot social dilemmas (that is, no repetitions of a game) show a cooperation rate somewhere between 40% and 60%. This also accounts for the initial stages of finitely repeated trials (Ledyard 1995). Kerr and Kaufman-Gilliland (1994), for example, reported a cooperation rate of 57%. In his meta-analysis of over 100 social dilemma experiments, Sally (1995) reported an average rate of cooperation of 47% across a wide variety of conditions. Camerer and Thaler (1995) and Davis and Holt (1993) report about 60% investment of a subject’s initial endowment in public goods.

Of course, cooperation is contingent upon many things. For instance, contribution rates may differ between discrete contributions, all or none, and continuous contributions, where people can contribute any amount they wish. If anything, contributions seem to be greater in the latter than the former condition (e.g., Suleiman and Rapoport 1992). Evidently, around 50% approach the experimental social dilemma with an intention to cooperate (Biel and Thøgersen 2007, p. 95-96). Let us hitherto stick with this figure.

5.1.2 *Subjects’ Contributions decline with Repetition*

It is a robust finding that contributions decline with repetition⁴¹ (Davis and Holt 1993, amongst others).

However, the question whether the decline is due to subjects learning their dominant strategies, or because cooperative behaviour by some individuals is not reciprocated by others, was controversially debated. Andreoni (1995) suggested that the movement towards the equilibrium in the later periods of the experiments is due to peoples' frustrated attempt at cooperation, rather than learning the free-riding incentives. Latest research indicates (e.g., Fischbacher and Gächter 2001, Kurzban and Descioli 2007), however, that this cannot only be reduced on learning but is driven by more complex patterns, e.g., by (heterogeneous) types of players (see section 5.2.2) and the combination and interaction of different contextual variables that influence behaviour (see section 6).

In the broader context, the unravelling of cooperation over time raises the question of whether there are social mechanisms that can prevent the decay of cooperation. A potentially important mechanism is social ostracism. We will discuss this issue later on with reference to punishment opportunities, introduced in a series of experiments by Fehr and Gächter (2000) and Camerer and Fehr (2002, p.11).

5.1.3 Face to Face Communication improves the Rate of Contribution

Empirical results – based on the study of Dawes (Dawes et al. 1980) – state that only 31% of the subjects contribute without communication (or with irrelevant communication for the concrete situation), while 72% contribute when relevant communication occurs (Ledyard 1995, p. 20); this has been confirmed by a number of other researchers (e.g., Dawes et al. 1977, Ostrom 1998).

Putting communication in a broader context, Meier (2006, p. 18) emphasizes also the importance of the way how communication is initiated, i.e., how one is asked, and, whether one is asked at all. The latter, “the importance of being asked”, is well tracked in the literature. For instance, studies demonstrated this effect for the decision to volunteer (Freeman 1997), to donate money (Long 1976), to participate in political demonstrations (Opp 2001), and even to rescue Jews during the Second World War (Varese and Yaish 2000). The importance of being asked is not only due to selection, in that people who look like potential volunteers are asked. The requests carry social pressure with them, and therefore people are more likely to be persuaded by a personal request than by written requests. A further result is that the

probability of contributions is the higher the closer the relationship to the requester is (Freeman 1997, Meier 2006).

5.1.4 Increases in Marginal Payoffs improve Cooperation

A solid empirical basis documents peoples' reaction on the price of giving, supporting the view that changes in relative prices matter (see section 2.2.6.1, for more details see also 6.2.1.1). Ledyard (1995) states “subjects do appear to respond to incentives in a predictable and systematic fashion” (p. 46). Those authors that have controlled the marginal payoff (marginal per capita return, in short: MPCR) to assess its effect on contributions generally observe consistency with the hypothesis that “marginal incentives matter.” (Ledyard 1995, p. 45-47).

The costs and benefits of giving

Another general conclusion is that attitudes and norms have more effect on one's behaviour that are relatively inexpensive or easy to perform (see, e.g., Stern 1992, Gardner and Stern 2002, Diekmann and Preisendörfer 2003, and the relative price effect in section 6.2.1.1). Further evidence comes from the study by Bettenhausen and Murnighan (1991): in pairs that had established cooperation, a structural change was introduced. This implied that defection became more profitable. As a result, the earlier norm supporting cooperation was no longer effective and cooperation rates decreased drastically. Research on common pool resources (CPRs) shows a different pattern. Despite high cooperation costs, reciprocity norms seem to uphold cooperation (Biel and Thøgersen 2007, see also section 3).

In 1995, when Ledyard reviewed the latter findings, altruism theories, reciprocity, or heterogeneity in individuals, for instance, had not yet been addressed. More recent evidence from both economic and psychological voluntary contribution mechanism (VCM) experiments now indicate that there are substantial differences in subjects' attitudes towards contributing to the public good (Dowling et al. 2000, p. 3, Offerman et al. 1996). An altruist, for instance, is “immune” to increases in marginal payoffs, thus this question needs further investigation as well as the burgeoning number of determinants affecting contributions (see also section 6). Up to

here, in Ledyard's words, "it was just to give an idea about how experiments with public goods have been conducted. In the following section we concentrate on what modern experimental research has discovered and, therefore, where the next work might begin" (Ledyard 1995, p. 36).

5.2 Current State of Research

Summarizing the main research agendas on social dilemma analysis should include recent advances in the understanding of reciprocity and conditional cooperation (1), the importance of differences and heterogeneity within individuals (2), means by which norms are enforced (at the individual and group-level) by punishing (3a) or by means of institutional design (communication, group size, assignment of property-rights) (3b).

We will proceed as follows. As several different types of models represent reciprocal behaviour, including the models reported by Levine (1998), Guttman (2000), Rabin (1993), Fehr and Schmidt (1999), Dufwenberg and Kirchsteiger (2004), Sobel (2005), Cox et al. (in press), and Cox et al. (2006), we discuss the most important findings on reciprocity in section 5.2.1.

That players' contributions correlate closely with their reported expectations of other group members' contributions is supported by a wealth of data (Bornstein and Ben-Yossef 1994, Braver and Barnett 1974, Croson 1998, Dawes et al. 1977, Komorita et al. 1993, Messick et al. 1983, Yamagishi and Sato 1986b). Evidence in favour of conditional cooperation can show that expectations about the behaviour of others are positively correlated with one's own behaviour. We will discuss this in section 5.2.1.2.

One of the major advances during the last decade in understanding cooperativeness in social dilemma situations was research on heterogeneity within individuals and their differences in behaviour derived therein. We will address this in section 5.2.2.

Players are willing to incur costs to punish those who contribute relatively little to the public good. Scholars interpret this as a hint at anger directed towards low contributors (Fehr and Gächter 2002, Yamagishi 1986a, Kurzban and Descioli (2007, in press)). Furthermore, results illustrate that public goods can be provided at high levels if participants are allowed to monitor the decisions made by other participants and punish behaviour deemed anti-social (Fehr and Gächter 2000, Bowles et al. 2001,

Bochet et al. 2003, Sefton et al. (2000, 2006), Carpenter 2004). Taken together, these findings strongly suggest that at least some substantial fraction of the population is trying to play some sort of reciprocal strategy in public goods games. We will discuss punishment as a means of norm enforcement in section 5.2.4.

Finally, the importance of the underlying institutional environment⁴²⁾ is discussed. Results ranging from effects of communication and group identity, property rights and general framing effects are elaborated in section 5.2.3. Motivational crowding-out through monetary incentives, civic duty, distrust, laws, rules and contracts follow in section 5.2.5.

5.2.1 Reciprocity

Following Grossmann (2002) and Meier (2006b), it has been widely recognized that reciprocal behaviour can substantially affect outcomes of economic transactions, even with macroeconomic implications. For instance, fairness considerations in the labour market between employers and employees have been suggested to affect both unemployment and the wage distribution (Akerlof 1982, Akerlof and Yellen (1988, 1990)). Survey evidence shows that price rigidities and wage setting behaviour is motivated by these factors (e.g., Agell and Lundborg 1995, Bewley 2000, Kahneman, Knetsch and Thaler 1986, Levine 1993, Grossmann 2002). Findings are scattered across the natural and social sciences (Diekmann 2004, Kollock 1998, Kopelman et al. 2002). Details about the psychology of reciprocity have been illuminated using the PD game (e.g., Friedland 1990, Komorita et al. (1991, 1993)), including variables such as the influence of social identity (Orbell et al. 1988, Wit and Wilke 1992). The theory of reciprocal altruism has stimulated research efforts aimed at understanding the cognitive mechanisms involved in maintaining reciprocal relationships (see Cosmides and Tooby 2006 for a recent review). Crucially for our analysis in games such as the PD, there is a great deal of evidence that people differ in the relative strength of certain motives (selfishness, cooperativeness, etc.) in these interactions (e.g., McClintock and Liebrand 1988, Parks and Rumble 2001, Van den Bergh et al. 2006, Van Lange 1999, Van Lange and Visser 1999, Kurzban and Descioli (2007, in press, p. 2)

Evidence from laboratory experiments shows that reciprocal behaviour is prevalent even in anonymous

one-shot labour market games (e.g., Fehr et al. 1996, Fehr et al. (1993, 1998), for a comprehensive survey of experimental evidence about fairness and reciprocity, see Fehr and Gächter 2000, and Grossmann 2002, p. 29ff). Data from experiments reported by Blount (1995), Offerman (2002), McCabe et al. (2003) and Charness (2004) also support the conclusion that reactions to the intentional actions of others are a significant determinant of behaviour (Falk and Fischbacher 2006, Grossmann 2002).

Further evidence of reciprocal behaviour has been found in conjunction with merchandising, political “logrolling” (a number of examples can be found in Cialdini 1993), tax compliance (Smith 1992), and tipping in restaurants (Seligman et al. 1985, Conlin et al. 2003, and Azar 2004, for an excellent account). To test the effects of reciprocal norms in charitable giving, Falk (2004) conducted a large-scale field experiment in which potential donors were provided with one of the following: no gift, a small gift, or a large gift in the solicitation letter. The relative frequency of donations was 75 percent higher among those receiving a large gift compared with the “no gift” treatment (Meier 2006, p. 9).

The above only provides a fraction of a mosaic, in fully capturing the rich behavioural patterns, e.g., studying reciprocity in larger groups and outside the laboratory is a necessity, as the next section will hint to. Two things are clear, however: reactions to others’ intentional actions matter and anticipations of those reactions matter as well (e.g., Cox et al. 2007).

5.2.1.1 Reciprocity in larger Groups

Still, as real-world dilemmas occur in groups larger than dyads, simulated in lab experiments, further evidence from natural settings will deepen our understanding of reciprocity. Two recent field studies confirmed the general finding in the bigger context that reciprocity is just as important in big groups as it is in dyads in the laboratory (see, e.g., Liebrand (1997) who investigated on decisions about water use during a drought, and Shang and Croson (2006) who report about contributions to public radio). However, elucidating the details of reciprocity in larger groups is a tricky task, because (1) specifying peoples’ reciprocal strategies with precision is complex (see, e.g., Parks and Komorita 1997) and (2) both theory and a substantial amount of empirical evidence support the view that there are important individual differences in peoples’ reciprocal motives

(Kurzban and Descioli (2007, in press, p.3, and section 5.2.2).

5.2.1.2 Conditional Cooperation – Direct Evidence from the Laboratory and the Field

In their laboratory experiment, Fischbacher et al. (2001) let vary the average behaviour of the group at random. Particularly, subjects in their PD game had to decide how much to give to a public account dependent of the contributions of others. The study concludes that roughly 50 percent of the people increase their contribution if the others do so as well, although the monetary incentives always imply full free-riding (see dotted line in Figure 5).

However, the figure also reminds us that a substantial fraction of the subjects (30 %) are complete free riders while 14 % of the subjects exhibit a hump-shaped response⁴³. Yet, as Fehr and Fischbacher (2002) note, there is a sufficiently large fraction of individuals that can be characterized as conditional cooperators such that “an increase in the other group members’ contribution level causes an increase in the contribution of the ‘average’ individual”⁴⁴ (p. 15); see the bold line in Figure 5.

Field Evidence

In contrast to most studies about conditional cooperation, which are based on laboratory experiments, Andreoni and Scholz (1998) provide a non-laboratory study and find that one’s own donation depends on the donations of one’s reference group. Their results show that if the contribution of those in one’s social reference group increases by an average of 10 percent, the expected rise in one’s own contribution is about 2 percent to 3 percent. However, as Meier (2006) argues, because the reference group in this study is constructed on socio-economic characteristics, it does not provide a direct test of how people react to the behaviour of others (p. 9).

Frey and Meier (2004) find supporting evidence of conditional cooperation in a field experiment. Students at the University of Zurich were asked whether they wanted to contribute to two social funds each semester. In this experiment, students were randomly informed either that many other students (64 percent of the student population) had contributed to the two funds or that few other students (46 percent) had

contributed. The basis of this information was either the average behaviour over the last ten years (the lower contribution rate) or behaviour in the previous semester (the higher contribution rate). Their analysis shows that students increase their pro-social behaviour when faced with many others who do the same (Meier 2006, p. 11).

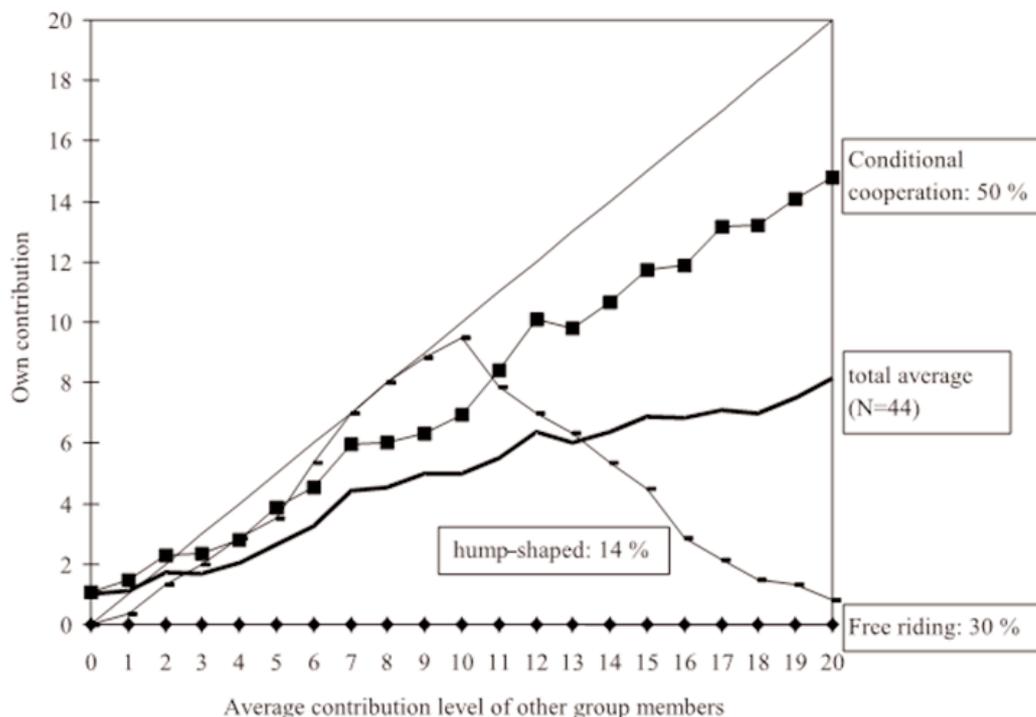
5.2.2 *Types of Contributors and Individual Differences*

Lately, experimenters have become as interested in the heterogeneity of behaviour as they used to be in average behaviour (e.g., Fischbacher et al. 2001). Recent empirical work by psychologists Kurzban and DeScioli (2005 and 2007) suggests that individual differences in contributions are not idiosyncratic, but rather reflect strategic types, each possessing certain and appropriate features. These results are consistent with decades of empirical evidence suggesting that there are important individual differences in social dilemmas involving multiple players (Budescu et al. 1997, Fischbacher et al. 2001, Goeeree and Holt 2002, Isaac et al. 1984, Kortenkamp and Moore 2006, Liebrand 1984, see Au and Kwong 2004, Kopelman et al. 2002, Kurzban and Houser (2001, 2007) and Kurzban and DeScioli 2007 for reviews).

Loosely speaking, as the behaviour of others (in dilemma experiments) is unknown to the participants, the intention to cooperate can be attributed to individual characteristics. Cooperators have been characterized as persons that have a pro-social value orientation (van Lange et al. 1997) and/or put trust in others' tendency to cooperate (Yamagishi 1986a, Biel and Thøgersen 2007, p. 95-96). Free riders, on the other hand, have been characterized as persons that have a self-interested value orientation and have therefore been called pro-selfs (see section 2.2.7). However, the number of player types distinguished varies across different models. Kurzban and DeScioli (2007) suggest three types of players: reciprocators, altruists and free riders to incorporate differences among players in their willingness to contribute and the extent to which they condition their contributions on others' contributions, whereas, e.g., Fischbacher and Gächter (2006) add a fourth type, labelled "others" to catch "noisy-types".

Figure 5: Contributions of Individual Subjects as a Function of Other Members' Average Contributions

Source: Fischbacher et al. (2001)



Let us stick with Kurzban and Houser (2005). They measure types as follows: First, subjects simultaneously make initial contributions. They are then repeatedly given the opportunity to revise their contributions for an unspecified (but randomly determined) number of opportunities. Subjects play several such rounds with varying numbers of opportunities for revising contributions. Finally, subjects are classified statistically by calculating each subject's "linear conditional-contribution profile". Kurzban and Houser (2005) find 20% free riders, 13% cooperators, and 63% reciprocators. Burlando and Guala (2005) take a different approach and use a mixture of methods to classify types: They use the so-called strategy method, value orientation tests, experimental choices and questionnaires. They find 32% free riders, 35% reciprocators, 18% cooperators and 15% "noisy"-types. Following Fischbacher and Gächter (2006), Bardsley and Moffatt (2005) measure types by using the "conditional information lottery" to vary other's contribution behaviour exogenously. They find that 25% are free riders, 39% are strategists (who only cooperate strategically), 29% are reciprocators and 6% are altruists.

Finally, the subjects in Muller et al. (2005) classify 35% as selfish subjects, who give nothing in the second stage, irrespective of the first stage contribution of the other players. 38% are conditional cooperators, who condition their second stage contribution positively on the first stage contribution of others. However, the frequency distributions of types are hardly comparable because designs differ in too many details. Yet, the fact that all studies find substantial heterogeneity supports the finding that there is heterogeneity in subjects' contribution behaviour (Fischbacher and Gächter 2006).

5.2.3 Institutional Environment

From a political perspective, the institutional environment may be used by authorities to influence social preferences when they prescribe and enforce social norms (Rodriguez-Sickert et al (2007, in press, p. 1). The aspects discussed in the subsections hereafter constitute means (or rules) an experimenter can use to bring control in his or her experiments.

5.2.3.1 Anonymity

Social sanctions framed as social approval or disapproval are most important (and effective) if each person's identity is revealed. In situations where anonymity is lifted, pro-social behaviour is expected to be most pronounced (Rege and Telle 2004). An illustrative case is brought forth by Soetevent (2005), who examined the role of anonymity in a field experiment in Dutch churches. In a series of worships, either closed or open collection bags were randomly used for the collection of donations. The use of open baskets where the neighbours on each side could identify the donor's contributions resulted in an increase by 10 percent (people started to give larger coins when open baskets were used (Meier 2006)).

5.2.3.2 Group Identity, Values (and Communication)

We have already discussed the positive effects of communication on cooperation (Dawes et al. 1977, Ostrom 1998 and Sally 1995, see also section 5.1.3). Here, some additions to these findings are made. For example, the communication-effect is not related to just any kind of communication, but only communication that is relevant for the given situation. In subsequent studies Dawes et al. (1988) and Orbell et al. (1988) emphasized the importance of group identity to account for the higher rate of cooperation. They argued that as people communicate, a group identity is activated that enhances the importance of group welfare over individual welfare. However, this explanation was challenged by Bicchieri (2002), who instead proposed that communication elicits social norms (Biel and Thøgersen 2007, p. 96).

The latter explanation is supported by the notion that the majority of social dilemma studies are conducted in Western cultural contexts where both the researcher and the participant hold more individualistic cultural values (values that emphasize independence, individual goals, and self-reliance (see Hofstede 1980, Triandis 1995)). Chen et al. (2007) argue that while both social norms and individual attitudes are important determinants of behaviour (Ajzen and Fishbein 1980), research from cross-cultural psychology suggests that in an individualistic culture, people's behaviour is more likely to be driven by their own attitudes rather than norms (Triandis 1995). This may explain why group identity (members' attitude towards the group) became the dominant expla-

nation of the communication effect and why more studies have been conducted to test the group identity hypothesis rather than the group norm hypothesis. Chen et al. (2007) thus examine in their latest study how individual cultural orientations moderate the effect of group norm and group identity on individual cooperative decision-making (p. 261ff).

5.2.3.3 Maintaining Cooperation through non-binding Agreements

Related to the above, because outcomes in the VCM have tended to be sub-optimal, re-searchers have investigated ways in which cooperation may be better established and main-tained. Ostrom et al. (1992) investigate the maintenance of cooperative decisions and find that promises about future actions can be useful in maintaining cooperation, even when the promises are non-binding (Walker and Halloran 2004). They also find that cooperative agreements made verbally and supported by internal monetary sanctions, i.e., those imposed freely by group members, are even more powerful (this is in line with other research). On the other hand, they observe that the opportunity to sanction, independent of verbal agreements to cooperate, can actually lower group welfare, when the costs associated with sanctioning are taken into account (Walker and Halloran 2004, p. 245). This latter finding, however, cannot be generalized but depends on concrete experimental design and framing effects.

5.2.3.4 Framing Effects (the situational Context)

Situations where the same facts are interpreted differently, that is, depending on the situational context, are a good example for framing effects, which are well documented in the literature. In the famous "Asian Disease experiment" of Tversky and Kahneman (1981), for example, subjects' preferences for disease control programs reversed if the outcomes were framed in terms of "number of lives lost" instead of "number of lives saved". Another example of framing effects constitutes higher contributions to a public good. Contributions were higher when the game was framed as community social event, for instance, than when it was framed as an economic investment (Ross and Ward 1996, Hagen and Hammerstein 2006, p. 345).

Domains in which decisions take place

Varying the decisional context in reverting a social or ethical decision in a business decision, Biel and Thøgersen (2007) report on a study by Tenbrunsel and Messick (1999) where two groups of subjects took the role of managers that were asked to allocate part of their budget in running exhaust gas filters that would reduce polluted air emissions. If most managers did so, the goal of the company would be reached. In one of the two groups, a weak sanctioning system was introduced. If managers in this group did not comply with the company's policy, there was a small risk that they would be met with sanctioning costs. No commitments were asked for or given in advance.

In the group without sanctions around 75 % of the managers cooperated, while less than 50 % did so in the sanctioning group. Evidently, the critical cue here is the sanctioning system. Without sanctions, the managers saw the decision as an ethical one: One should stand up for the common good. However, when sanctions were introduced it turned into a business decision. Although the expected costs for not running the exhaust filters were somewhat higher in the sanctioning group, the costs were still so low that it did not pay not to run the exhaust filters.

This study also confirms an aspect we already mentioned in section 3: in the domain of business different social norms may guide behaviour than in policy or private domains (Biel and Thøgersen 2007, see also section 5.2.5 for examples with profound effects for motivational crowding-out).

5.2.3.5 Property Rights

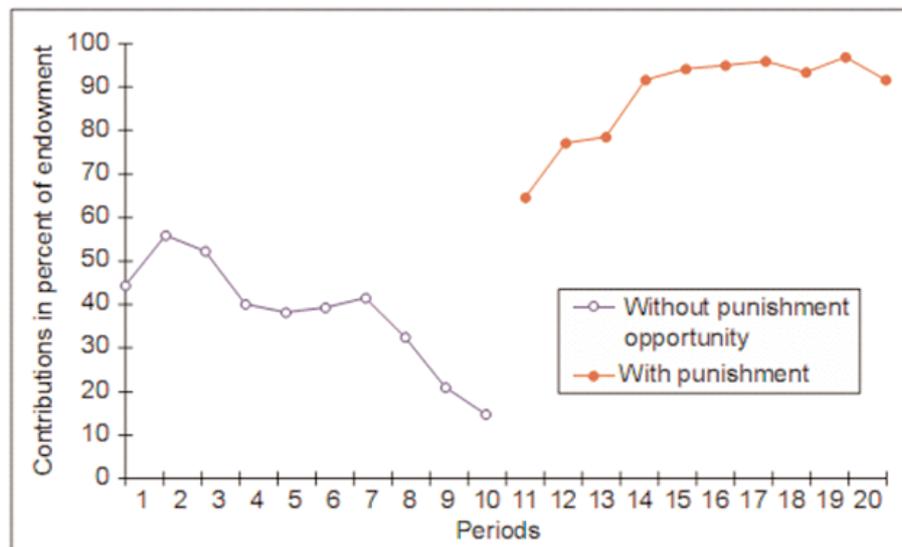
The way how property rights are achieved is crucial. Cherry et al. (2002) investigated in a situation where earned wealth (by work) was divided by participants compared to unearned wealth (by gift or chance) given by an experimenter. Within the treatment where people received the money as a gift, only 15 % percent offered nothing to the others. In sharp contrast, when people had to earn the prize (40\$), 70 % of the subjects offered nothing to the other person (Meier 2006, p. 16). More related evidence can be found throughout the following sections and the discussion on inequality aversion (see section 2.2.2.4).

5.2.4 Sanctioning (Norm Enforcement)

Institutions allowing for (collective) punishment are able to bring about stronger cooperation. As punishment usually is costly (second order dilemma), its use is limited and cooperation rates should be about to decay. A plausible explanation for the decay of cooperation is that cooperative contributors attempt to retaliate against free riders in the only way available to them - by not contributing themselves (Andreoni 1995). Retrospectively, subjects often report this behaviour.

However, also the opposite is possible. Ostrom et al. (1992), for instance, let subjects interact for about 25 periods in a public goods game, and by paying a “fee”, subjects could impose costs on other subjects by fining them. Since fining imposes costs on the individual who uses it, but the benefits of increased compliance accrue to the group as a whole, the only sub-game perfect Nash equilibrium in this game is for no player to pay the fee, so no player is ever punished for defecting, and all players defect by contributing nothing to the common pool. However, the authors found a significant level of punishing behaviour. The experiment was then repeated with subjects being allowed to communicate, without being able to make binding agreements. In the framework of the homo oeconomicus model, such communication is called cheap talk, and cannot lead to a distinct sub-game perfect equilibrium. But in fact such communication led to almost perfect cooperation (93 %) with very little sanctioning (4 %) (Dawes et al. 1986, Yamagishi (1986a, 1986b), Gintis 2000, p. 6).

Figure 6: Subjects' average Contributions to the Public Good as a Percentage of their Endowment over Time.



Source: Fehr and Rockenbach (2004) citing Fehr and Gächter (2000).

The figure shows subjects' average contributions to the public good as a percentage of their endowment over 20 periods of time. Whereas during the first ten periods there were no punishment possibilities, during periods 11-20, there were. Punishment was also costly for the punisher. “At the beginning of the first ten periods cooperation rates of roughly 50% of the endowment were observed, but cooperation unravelled over time. The majority of subjects contributed nothing to the public good in period ten, and the rest contributed little. In period 11, the subjects were informed that a new experiment would start in which they would have the opportunity to punish the other group members at a cost to themselves. The punishment opportunity immediately increased cooperation levels to 65% of the endowment. Moreover, over time cooperation rose dramatically, until almost full cooperation was attained.” (Fehr and Rockenbach 2004, p. 785).

Following Gintis (2000), the design of the Ostrom et al. (1992) study allowed individuals to engage in strategic behaviour, since costly retaliation against defectors could increase cooperation in future periods, yielding a positive net return for the retaliator.

And what happens if any strategic possibility of retaliation is removed? This is what Fehr and Gächter (2000) studied. They set up a repeated public goods game (2-stage “punishment game”) with the possibility of costly retaliation, but they ensured that group composition changed in every period, so subjects knew that costly retaliation could not confer any pecuniary benefit to those who punish. In the second stage of the game all individuals’ contributions were revealed to the group and subjects had an opportunity to sanction each other. Punishment of free-riding was prevalent and gave rise to a large and sustainable increase in cooperation levels. Notably, the increase in contributions overstates the welfare effect of sanctions, if costs of punishment are accounted for. A high level of cooperation was generally sustained even in the last period of play, see Figure 6, showing that the deterioration in cooperation when no punishment is allowed is not simply an end-game effect (Gintis 2000, p. 6-7).

The work of Fehr and Gächter (2000) attracted the interest of other researchers who have confirmed their main result and extended the analysis in other interesting directions. Bochet et al. (2003) confirm that punishment is used to maintain or increase contributions as well. In addition, they examine the role of face-to-face communication which, from their preliminary analysis, seems to not effect contribution decisions in the presence of punishment (Carpenter 2004, p. 5-7). Sefton et al. (2000) conducted another noteworthy study. Their contribution is to examine the relevance of rewards, which we will discuss in section 5.2.4.2.

5.2.4.1 Third-party Punishment

Sanctioning behaviour can involve just the participating parties (“second party”-punishment) or a third, independent party (“third-party”-punishment). In the former case, the sanctioning individuals (as “second parties”) may punish because their economic payoff is directly affected by the norm violation (as in section 5.2.4). In the latter case, for instance, one party in an exchange relationship may violate an implicit agreement, hurting the exchange partner. The cheated partner is the “second party” in this case, while an uninvolved outside party, who happens to know

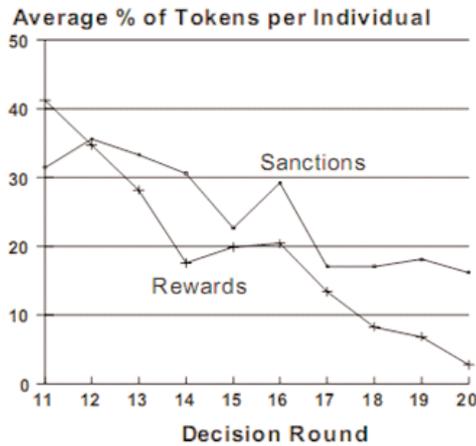
that cheating occurred, is the “third party”. Although the norm violation does not directly affect the third party’s economic payoff, the third party may be willing to enforce the norm (i.e., punish), even though it may be costly (Fehr and Fischbacher 2004).

The idea behind third party involvement is that while if only the second party imposes sanctions, a very limited number of social norms can be enforced, because norm violations often do not directly hurt other people, whereas a third party can greatly enhance the scope for norms punishable. An example for second-party punishment is the case of voting norms (Knack 1992). Nobody is directly hurt if somebody does not vote or votes for the “wrong” party. Likewise, in cases of cooperative effort norms, a shirking individual imposes little cost on any particular other individual if work teams are sufficiently large. Thus, third-party sanctions enhance the scope for norms that regulate behaviour (Fehr and Fischbacher 2004). In their experiment, Fehr and Fischbacher found that almost two-thirds of the third parties indeed punished the violation of the distribution norm and their punishment increased the more the norm was violated. Likewise, up to roughly 60 % of the third parties punished violations of the cooperation norm. Thus, their results show “that the notion of strong reciprocity extends to the sanctioning behaviour of ‘unaffected’ third parties” (p. 63).

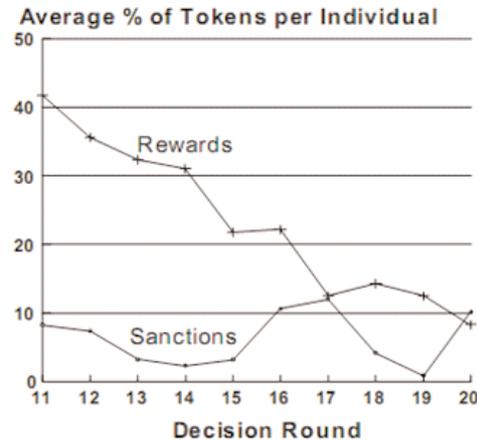
5.2.4.2 The Role of Rewards

Sefton et al. (2000 and 2006) extend the literature by allowing for rewards as well as sanctions in a two-stage-game. The structure of the Sefton et al. experiment is analogous to that of Fehr and Gächter (2000) except it also includes a “rewarding game”, in which subjects distribute rewards in the second stage of the game instead of sanctions. Figure 7 displays the average percentage of tokens used for sanctions and /or rewards across 20 periods. Their results indicate that individuals prefer sanctioning to rewarding (see left-hand panel Figure 7). The sanctioning treatments yield results consistent with these of Fehr and Gächter. In the treatments that allow rewarding, they find that group account allocations increase, but subjects are better able to sustain contributions in the treatments that allow sanctioning. Initially, rewards are used, but by the end of the experiment, rewards give way to sanctions (right-hand panel of Figure 7, Walker and Halloran 2004, p. 245, Carpenter 2004).

Figure 7 -Tokens Used for Sanctions and/or Rewards



motives among ordinary citizens. The test case in their study was an upcoming referendum about the



Source: Sefton et al. (2006, p. 30).

Figure 7 displays the average percentage of tokens used for sanctions/rewards across 20 decision rounds in a two-stage mechanism. In the first stage, no rewards and sanctions are allowed. The left-hand panel visualizes behaviour in the second stage: in the sanction treatment, subjects begin allocating on average 31 % of their second stage tokens to sanctions, but this percentage falls to 16 % by the final round. The decline in the use of rewards is more pronounced (from 41 % to 3 % in the final round). The right-hand panel displays the use of rewards and sanctions in a (combined) sanction and reward-treatment, which produces a different pattern: subjects initially prefer using rewards to sanctions. However, this pattern is not maintained towards the final rounds (Sefton et al. 2006, p. 12).

acceptance of a repository for nuclear waste in the participants' home canton in Switzerland. Initially, upon a direct request, about 50 % of the respondents were in favour of the location. In a second stage, they introduced monetary compensation (the sum amounted to between CHF 2500 and CHF 7500). Once compensation was introduced, the acceptance rate dropped to 25 %. Without money, procedural fairness surrounding the location decision predicted acceptance. With compensation, procedural fairness no longer had any effect. Rather, economic consequences for the voters determined their decision (Biel and Thorgersen 2007, see also 6.2.1.1).

5.2.5 (Motivational) Crowding-out Effects

We have emphasized theoretical aspects of crowding-out effects in section 2.2.6.2. Here, we will address three exemplary situations (though interrelated): pecuniary incentives, intrinsic motivation in form of civic duty, distrust, laws and rules and through unfair punishment.

5.2.5.2 Civic Duty and Distrust (and Laws)

A generalized variation of the above example concerning locally undesirable projects, are "Not In My Backyard" or NIMBY-problems. Addressing the same problem from a different perspective, namely, compensation from neighbouring communities, Frey and Oberholzer-Gee (1997) argue for the requirement of intrinsic motivation in the form of civic duty. Economic theory proposes a simple solution for such projects, which are often socially desirable but impose considerable costs on the immediate neighbours: A community that hosts a NIMBY-project should be compensated by all the other communities such that its net benefit becomes positive. Frey and Oberholzer-Gee analyzed the reaction of residents to such a compensation for the acceptance of the above-mentioned nuclear waste depository. Given the results with a decline of 50 % in the accep-

5.2.5.1 Monetary Incentives

Monetary incentives do not only affect cooperation rates in business. As shown by Frey and Jegen (2001), economic incentives can crowd out moral

tance rate, the authors' favoured explanation for this reduction is that "the sense of civic virtue engendered by acceptance of the noxious facility was crowded out". Civic duty to behave pro-socially can be crowded out not only by explicit monetary incentives, but also by laws and rules. An important application of this notion is tax morale, where the crowding-out effect can have huge costs. Tax morale, or the motivation that explains the low rate of tax evasion in many countries, depends largely on trust between the government and the citizens. A constitution that tries to discipline citizens can be perceived as distrusting and therefore decrease civic virtue (see Frey 1997a for empirical evidence, Meier 2006, p. 22, and sections 8 and 9 for a detailed account).

5.2.5.3 Rules, Contracts and Punishment

Akerlof (1982) suggested that imposing stiffer penalties for crimes might sometimes be counterproductive by undermining individuals' "internal justification" for obeying the law. Frey (1997a) provided evidence to that effect concerning tax compliance, and Gneezy and Rustichini (2000) found that fining parents for picking up their children late from day-care centres resulted in even more late arrivals. A plausible explanation is that, "by transforming a misdemeanour into a commodity that parents could buy cheaply, the fine eroded their sense of duty" (Rodriguez-Sickert et al. 2007). In other words, fines "change parents' perception of extra-care service from a generous, non-market activity to a market commodity, and whether to obtain extra-care changes from a social norm to a price-based market decision" (Houser et al. 2007, Benabou and Tirole (2004, 2005)).

5.2.6 Happiness and Well-Being

Let us now turn from punishment to a more pleasant topic, happiness, which, from an economic (behavioural) perspective, could prove a promising avenue of research in further deepening our understanding of the motives that underlie cooperation. Although the precise meaning of happiness is somewhat elusive, many social scientists agree that happiness is an important goal of human life and perhaps best summarizes success and achievement in a general way (Frey and Stutzer 2002a, 2002b, Meier 2004). Research in "New Psychology of Happiness" has,

according to Layard (2005), revealed three stable findings (of interest for economists):

- A person's happiness is negatively affected by the income of others (a negative externality).
- A person's happiness adapts quite rapidly to higher levels of income (a phenomenon of addiction), and
- The happiness we get from what we have is largely culturally determined (p. 1).

Applied to our topics, we might want to know whether reciprocal (pro-social) people were happier (or less happy) than non-reciprocal types. Answers to this question have recently been derived empirically (by economists) by using data from the Socioeconomic Panel (SOEP)⁴⁵, which assesses life satisfaction with several questions. Dohmen et al. (2006) in their study use three different measures:

- (1) the number of close friends,
- (2) income, and
- (3) participants' subjective well-being⁴⁶.

(1) The SOEP provides answers to the question how many close friends respondents have. Since friendships are pleasurable per se but are also an important part of a person's network, having more friends is a possible indicator for a variety of positive social and economic outcomes. In their analysis, Dohmen et al. (2006) regress the number of close friends of being positively or negatively reciprocal and find a strong and asymmetric effect: While positive reciprocity seems to promote friendship networks, negative reciprocity is harmful. Both effects remain significant after controlling for a large set of variables.

(2) Turning to a financial measure of success, they regress monthly labour income on both positive and negative reciprocity, and find that monthly labour income is significantly higher for people who are positively reciprocal. In terms of magnitude, income is about 14 percent higher for those who answer, "applies to me perfectly" on the 7-point scale compared to those who state "does not apply to me at all". However, as the authors argue, "higher incomes for positively reciprocal people are apparently explained by the fact that these people work harder. Once controlled for hours worked, the positive reciprocity coefficient gets considerably smaller and insignificant". This finding is consistent with the fair

wage-effort relation: Reciprocal workers respond in kind by working longer for receiving higher wages.

(3) Controlling for happiness, the results in Dohmen et al.'s (2006) study reveal an asymmetry between positive and negative reciprocity: While happiness is positively correlated with positive reciprocity, the opposite holds for negative reciprocity. Both effects are found to be sizeable, robust and significant.

In sum, the results show that most people state reciprocal inclinations, in particular in terms of positive reciprocity. However, heterogeneity in the degree of reciprocity prevails, and the correlation between positive and negative reciprocity is only weak. The latter finding suggests that positive and negative reciprocity are distinctive behavioural concepts. This is most likely due to the fact that important determinants of reciprocity, such as gender or age are systematically different for positive and negative reciprocity. In terms of economic implications, Dohmen et al. find "quite convincing support for previous lab findings that highlight a link between fair treatment, positive reciprocity, and work effort". Finally, positively reciprocal people report to have more close friends, and a higher overall level of life satisfaction (Dohmen et al. 2006, p. 4-5), which will lead us to draw some further conclusion on the "success" of Homo Reciprocans in section 10.2.2 (p. 153).

5.2.7 Survey Research on Norms

Most of the research investigating the influence of benevolence values (and of norms generated from these values) on cooperation is based on survey research. Biel and Thøgersen (2007) analyze studies that have reported a positive correlation between benevolence values and a specific environment-friendly behaviour, such as recycling (e.g., Dunlap et al. 1983, Thøgersen and Grunert-Beckmann 1997), reducing personal car use (e.g., Garvill 1999, Nordlund and Garvill 2003), buying "green" products (e.g., Grunert and Juhl 1995), or political action for environmental protection (e.g., Stern et al. 1999).

A few studies have investigated - and confirmed - the assumed mediation of the influence of benevolence values on behaviour through the formation of a personal norm (e.g., Nordlund and Garvill (2002, 2003), Stern et al. 1999, Thøgersen and Grunert-Beckmann 1997). The main bulk of survey studies investigated only the relationship between personal norms and behaviour, however.

The study of the behavioural implications of felt moral obligation (i.e., a personal norm) to perform a pro-social behaviour started in the area of one-to-one helping (see the reviews in Schwartz 1977, Schwartz and Howard 1982).

A number of the studies above also measured perceptions about social norms for the specific behaviour in one's relevant reference groups (see also 5.2.3.2). They generally found that, although there was a significant and positive bivariate correlation between perceived social norms and behaviour, the correlation was strongly attenuated and in most cases became insignificant when personal norms were controlled for (e.g., Black et al. 1985, Hopper and Nielsen 1991, Thøgersen 1999).

The general finding in most of these studies is that when adding personal norms to these other predictors, the amount of explained variance in behavioural intentions or behaviour increases. The same has been found with regard to morally relevant behaviours in other areas (for a review, see Ajzen 1991). An exception and mixed evidence come from cases where pro-social behaviour is quite costly. Biel and Thøgersen (2007) conclude:

"It should come as no surprise that the person's non-moral values and evaluations are more important for behaviour under high-cost than under low-cost circumstances. In addition, it may be that in some of these cases the need for pro-social action is either not noticed or the person feels unable to perform any relevant behaviours that might help solving the need and, therefore, a cooperative personal norm is not activated (Schwartz and Howard (1982, 1984)." (p. 6f).

6 Contextual Variables that influence Contribution Behaviour (Chapter for lexical use only)

In this section, which should rather be used for lexical purposes than for direct reading⁴⁷, we will concentrate on what modern experimental research has discovered in terms of variables (collected as "stylized facts") that shape the individuals' contribution behaviour. What we are especially interested in is the likely direction of these contextual variables.

We have discussed the major robust findings, that is, declining contributions with repetitions, face to face communication and marginal payoffs affecting con-

tribution behaviour in section 5.1 (p. 69 ff). Based on the structure of Ledyard's (1995) survey, we now integrate experimental evidence since 1995 to document the progress in the understanding of underlying motives for (voluntary) contributions to public goods (concepts like conditional cooperation or punishment had been unexplored in 1995)⁴⁸).

The core of this chapter is section 6.2, containing Table 1, in which a bunch of variables, various researchers have identified as having an effect on the level of contributions, are organized around an institutional, a systemic and an environmental dimension. Based roughly on the grouping of variables according to Ledyard (1995, p. 38), it is enhanced by three columns that indicate progress within the last decade. These columns hold references to respective chapters for theoretical considerations, chapters containing additional experimental evidence as well as (if applicable) to chapters presenting policy implications that may be derived⁴⁹).

The rest of this chapter is organized as follows: section 6.1 provides a glimpse on incom-mensurability issues and methodological traps when conducting lab and field experiments as a primer to stylized facts in section 6.2. Section 6.3, finally, depicts the most important factors at a glance.

6.1 Methodological Traps in experimental Control (Lessons learnt)

In the 1980s, economists were at first struggling to get their experiments under control. Several methodological traps exist that can systematically bias the results obtained. Standing for a number of sources of errors, three early lessons are depicted:

- For instance, Bohm's (1987) flaw in design, as pointed out by Ledyard (1995, p. 17), was: "it is well known now that subjects may actually be trying to do what they think the experimentalist thinks they should be doing. Even subtle cues in the instructions can cause subjects' decisions to vary." (p. 17).
- An evenly important question, brought forth by Marwell et al. (1979), concerns the presentation of payoffs to the subjects. Questions include: Does the form matter? Are tables better than graphic presentations? Are functions a possible means to use for presenting calculations? According to Ledyard, it is widely recognized, for example, that changes in the placement of infor-

mation on a computer screen, the amount and form of feedback, and the complexity of instructions all can lead to changes in behaviour (Ledyard 1995, p. 26).

- Furthermore, honesty in procedures is crucial. Any deception can be discovered and contaminate a subject pool not only for that experimenter, but also for others to follow. Honesty is a methodological public good and deception is equivalent to not contributing⁵⁰ (Ledyard 1995, p. 27). What turns out to be particularly important to the decision again is the context in which the decision is made (remember framing effects in sections 2.2.5, 5.2.3, and 5.2.3.4).

In modern experiments, the traps mentioned have been carefully ruled out. Recent methodological questions affect extended experimental control. Gächter et al. (2004), for instance, object that laboratory experiments are conducted mostly with (affluent Western) undergraduate students. This is problematic if the link between trust attitudes and behaviour in laboratory experiments are investigated. They argue that going beyond student subject pools is important since students are not representative of the general population in many socio-economic dimensions (see, e.g., Carpenter et al. 2002, 2004), and a successful generalization to other subject pools for the larger society may therefore fail.

Similarly, anthropologists found that the variance in behaviour is much higher than what is observed in the (mostly Western) undergraduate subject pools (see Henrich et al. 2001). In terms of possible biases that may arise, Gächter et al. (2004) emphasize that "with respect to trust attitudes, we find that non-students are more trusting than students, yet controlling for the socio-economic background reveals that age is more important than the socio-economic status of being a white-collar or a blue-collar non-student. Second, non-students contribute more to the public good than students." (p. 507).

6.2 Stylized Facts - Variables affecting the Rate of Contribution in Social Dilemma Situations

The following table (Table 1) groups the variables identified by recent research into three main categories:

Table 1 - Stylized Facts for Variables and Incentives that affect (the percentage Rate of) Contributions to Public Goods

Source: Own enhanced compilation of variables based on the structure of Ledyard (1995, p. 30, table 10).

No.	(1) Stylized Fact (Description)	(2) Effect on Contribution (1995) *	(3) Effect on % Contribution (2008) *	(4) Theoretical considerations (section) *	(5) if applicable, additional experimental results (section) *	(6) if applicable, further results, e.g., policy implications (section) *
I.						
Environment** (easy to control, section 6.2.1)						
a	MPCR (marginal per capita return) / monetary incentives	++	++ & --- ***	2.2.6.1 5.1.4	5.1.4 5.2.5.1 6.2.1.1	9.2
b	Number of participants (Group size)	0	0	6.2.1.2	6.2.1.2	
c	Repetition	--	--	5.1.2	6.2.1.3	
d	Institutional framing (context-dependence)	++ / --	++ / --	2.2.5	7.3	8 9
e	Socio-economic Background	n/a	+		6.2.1.6	8.1.3
f1	Gender (new)	n/a	+/-		6.2.1.7	8.1.3
f2	Age	n/a	+/-	--	6.2.1.8	8.1.2.3 9.3
g	Grouping individuals according to certain inclinations (Group identity) (new)	n/a	+	5.2.3.2	6.2.1.4	8.1.3
h	Common Knowledge	+	see II (c,d,f)	see II (c,d,f)	see II (c,d,f)	
II.						
Systemic (difficult to control, section 6.2.2)						
a	Beliefs	+	+/-		6.2.2.1	8.1.2.1
b	Trust	n/a	+/-	2.2.3.1	6.2.2.2	8.1.2 9
c	Education and Economics Training	--	--		6.2.2.3	8
d	(In)Experience	--	--	5.1.2	6.2.1.3	8.2
e	Cultural values and differences	n/a	+/-		6.2.2.6	8.1.3
f	Learning (and confusion)	0	0	6.2.2.5	6.2.2.5	8.2
g	Altruism	?	+	2.2.2	5.2	8p.137)
h	Reciprocity (strong reciprocity; conditional cooperation)	n/a	++	2.2.3	5.2.1	10
i	Effort	?	+ / --	n/a	n/a	8.2

j	Risk aversion	?	n/a	n/a	n/a	
k	Heterogeneity in individuals	n/a	++	5.2.2	6.2.2.7	7.1
l	Fairness considerations (Reciprocity)	n/a	++			9.2.1
III. Institutional Design Variables (section 6.2.3)						
a	Institutions (in general)	n/a	y	2.2.5		
b	Institutional Framing (see l)	n/a	see (l)	5.2.3 ff	7.3	8 9 10
	Visibility of actions (e.g, observable givings by others)					
c	Communication	++	++	5.1.3 2.2.5	6.2.1.5	
d	Punishment	n/a	++	5.2.4	6.2.3.1	9.1.1.2 9.1.2.3
e	“Rebates”	+	+	2.2.6	5.2.5.1	
f	Unanimity	—				
g	Moral Suasion	?	n/a	6.1	n/a	
i	Property rights	n/a	+/-	2.2.5	5.2.3.5	8
j	Anonymity	n/a	—	5.2.3.1	5.2.3.1	9

* Symbols used: + means increase, 0 means no effect, — means decrease, +/- means there is an effect which depends on additional conditions, n/a in column (2) means that this variable has not been assessed (e.g, has not been known as influencing in 1995, or not been systematically studied by Ledyard), ? means that to my current knowledge I do not believe these have even been measured yet. A double symbol means the effect is strong and apparently replicable. A single symbol, other than ? means the effect is apparently there but weak and difficult to replicate. A symbol y or n means that there is an effect generally, but is not separable easily.

** Factors like provision point mechanisms (PMM) are skipped as they address aspects of extended experimental control.

*** through motivational crowding-out

(1) the environment (group size, incentives, repetitions, gender, age, ..), (2) systemic variables (trust, fairness, risk attitudes, beliefs, ..), and (3) design variables (such as unanimity rules, or structured communication).

The first two categories, both containing environmental influence, are split up into two parts to emphasize that some are more easily controllable with current experimental technologies. In particular, those identified as environmental are relatively straightforward to control, while those listed as systemic are more difficult. Variables in the category labelled “design variables” are factors identified by experimentalists, which should be more properly thought of as aspects of institutional design. These variables are amendable to change and the mechanism designer can use them to improve solutions to the free rider problem.

Furthermore, Table 1 summarizes what seems to be the consensus of experimentalists about the likely effect of change in one of these variables on the change in total contributions as a percent of the efficient level (columns 2 and 3). Some effects are more certain than others, in that replication has confirmed initial findings. Understanding behaviour would be easier if each of these variables had a separable and identifiable effect on contributions. Ledyard (1995) supposes “something like the robustness of the supply-demand equilibrium with private goods” (p. 37).

Some variables are left unexplained in the table. Ledyard calls some of these “cross-effects”. They are important, and, in some cases, cross-effects may even reverse the direction of effect of a variable (see, e.g., the chapter on motivational crowding out) (Ledyard 1995, p. 37).

We will commence with a discussion of stylized facts by following the structure of the above table, starting with environmental variables (section 6.2.1), followed by systemic variables (section 6.2.2), and institutional design variables (section 6.2.3).

For most stylized facts discussed hereafter, there is a table (heading the subchapter) describing links and interrelations to other variables and chapters where those variables have been discussed in detail (see Table 2 for an example).

Table 2 – Stylized Fact – Example for a Compilation of Interrelations to other Stylized Facts and Linkage to relevant Topics within this Work

(1) ... has been emphasized in section(s)	(2) ... (will be) summarized in section(s)	(3) ... is interrelated with .. (section(s))	(4) ... has impact on (section(s))	(5) ... has policy implications (for) ... (section(s))	(6) ... has a likely effect of:
5.1.4	2.2.6.1	2.2.6.2	6.2.2.2	8.2 Charitable giving	++

Source: own compilation.

What has been discussed before (and will be in the concluding chapters), will be referred to (columns (2) and (3)). In most cases, there are interrelations between variables, which are indicated in column (3). Column (4) hints to implications on other variables in general, and column (5) to implications in the policy sphere. Column (6) finally indicates the strength of the effect (ranging from strong positive (++) over no effect (0) to strong negative (— —) effect. A “+/-” sign indicates that the effect can take either one or the other direction, depending on implementation.

6.2.1 Environmental Variables

6.2.1.1 Monetary Incentives (and Marginal Payoffs)

Table 3 – Monetary Incentives (and Marginal Payoffs)

has been emphasized in section(s)	(will be) summarized in section(s)	is interrelated with .. (section(s))	has impact on (section(s))	has policy implications (for) ... (section(s))	has a likely effect of:
5.1.4	2.2.6.1	5.2.5.1	6.2.2.2	.. is of general importance e.g., with charitable giving	++

Source: own compilation.

An important methodological question has long been whether in- or decreasing marginal payoffs or the structure of monetary incentives matter for the results we obtain in economic experiments⁵¹). In recent years, a voluminous literature has emerged on the importance of financial incentives for making choices, for which Camerer and Hogarth (1999) provide a meta-analysis (comprising of 74 studies). The overall finding is that monetary incentives have a strong effect on (voluntary) contributions, which is in line with our discussion in section 5.1.4 and the role of relative prices (i.e., “the price of giving”) of pro-social behaviour in chapters 2.2.6 and 2.2.6.1 (we discussed the application of charitable giving). Finally, negative effects of monetary incentives on trust are discussed in sections 5.2.5.1 and 6.2.2.2, in that experienced subjects are more responsive to MPCR than inexperienced.

6.2.1.2 Number of Participants (Group Size)

Table 4 – Number of Participants (Group Size)

has been emphasized in section(s)	(will be) summarized in section(s)	is interrelated with .. (section(s))	has impact on (section(s))	has policy implications (for) ... (section(s))	has a likely effect of:
—	6.2.1.2	5.2.3.1 6.2.3.1	—	*	0

Source: own compilation.

* Group size alone has no effect. In combination with institutional factors like punishment, means for group composition and the lifting of anonymity, however, it has argued that group size may have positive effects (in the policy domain) when groups are small, single individuals can be targeted (lifting anonymity), and thus leading to higher cooperation rates when free-riders can be punished.

The impact of group size on behaviour has been studied thoroughly. We here consider experiments that have been conducted in game environments that do not allow free riders to be sanctioned (thus isolating the group size effect⁵²) or do not consider the logistic problems of large groups.

Two of the main results of this literature are that a) the number of people in a group, per se, does not matter, and b) contributions do not fall as groups become larger and, if anything, they tend to increase (for a summary, see Carpenter 2004). Larger groups appear to be at least as good at providing public goods.

Isaac and Walker (1988) and Isaac et al. (1984), in a comprehensive series of experiments, examined groups of the sizes of four, ten, forty, and one hundred participants. Considering the relatively smaller groups (4 and 10 persons), they find that size only matters when the return on the public good is low, in which case, contributions actually increase in large groups. When larger groups (40 and 100 persons) are examined, the authors find that contributions increase relative to smaller groups and that the effect is independent of the return on the public good⁵³ (Carpenter 2004, p. 5).

For the sake of completeness, let us consider early investigations on the influence of group size on contributions, namely Andreoni's (1988) results based on his pure altruist model⁵⁴, which predicts different outcomes. However, by now we know that these results only can be applied on about six percent of the population being pure altruists (see section 6.2.3.1 for figures). In the pure altruist model, Andreoni proves that as group size grows infinitely large, the proportion of the group contribution to the public good decreases to zero. Furthermore, Andreoni (1988) proves that as group size increases, average contributions decrease to zero while total contributions increase to a finite positive value. Underlying these results is the assumption that individuals treat the contributions of others as a perfect substitute for their own contribution. Consequently, as group size increases, individuals become less likely to contribute themselves and more likely to rely on the contributions of others (Brunner 1996, Carpenter 2006).

6.2.1.3 Repetition

Table 5 - Repetition

has been emphasized in section(s)	(will be) summarized in section(s)	is interrelated with .. (section(s))	has impact on (section(s))	has policy implications (for) ... (section(s))	has a likely effect of:
5.1.2	5.1.2	—	6.2.2.57	8 9	— —

Source: own compilation.

Repetition has become one of the most common features in VCM-settings. Its indisputable effect is a deterioration in contributions after some number of iterations. Assuming fully rational subjects and no sanctioning mechanisms, towards the last iteration, there should be no contribution at all. Empirically, however, approximately 60 to 80 percent of all subjects contribute nothing in the final period and the rest contribute little (Camerer and Fehr 2002, p.11, see also Figure 6 on page 81). A further explanation for the decline of contributions over time lies in the heterogeneity of individuals, as reciprocators stop cooperation when they gradually notice that they are matched with free riders.

6.2.1.4 Grouping Individuals according to certain Inclinations (Group Identity)

Table 6 - Grouping Individuals according to certain Inclinations (Group Identity)

has been emphasized in section(s)	(will be) summarized in section(s)	is interrelated with .. (section(s))	has impact on (section(s))	has policy implications (for) ... (section(s))	has a likely effect of:
5.2.3.2	6.2.1.4	6.2.1.5 5.1.3 3.1.1.1	6.2.3.1	8.1.3 8.2	+

Source: own compilation.

Group identity can be defined as members' positive attitudes towards their group. The group identity hypothesis states that discussion and communication (see section 6.2.1.5) within the group promotes members' identity (or positive attitudes) towards the group (Messick and Brewer 1983), which increases group members' cooperative behaviour (Chen et al. 2007, Fehr and Gächter 1999, see also section 3.1.1.1).

Brewer and Kramer (1986) and Kramer et al. (1986), for instance, used a "common fate"-manipulation for group identity and found that people who shared common fate were more willing to cooperate. Dawes et al. (1990), reviewing a series of studies they conducted during a 10 years period, conclude that "with no discussion, egoistic motives explain cooperation; with discussion, group identity - alone or in interaction with verbal promises - explains its dramatic increase" (p. 109; Chen et al. 2007, p. 260).

Another study is that of Leanne Ma et al. (2000), who investigate whether a high level of contributions can be sustained in groups of subjects who have been pre-selected on the basis of their altruistic inclinations. They investigate on whether the levels and dynamics of group contributions differ significantly between groups with altruists and groups of non-altruists and find that subjects' altruism has a weak but positive effect on group behaviour in the public good game (p. 1).

In section 8.1.3 we will discuss a policy instrument called "social engineering". The underlying idea is to achieve socially desirable (best) results by an optimal grouping of individuals according to certain inclinations.

6.2.1.5 Communication

Table 7 - Communication

has been emphasized in section(s)	(will be) summarized in section(s)	is interrelated with .. (section(s))	has impact on (section(s))	has policy implications (for) ... (section(s))	has a likely effect of:
2.2.5 5.2.3.2	5.1.3	6.2.1.4 5.1.3	2.2.5 5.2.4	is of general importance	++

Source: own compilation. In Table 1, communication is listed under "institutional design variables".

The effectiveness of communication, especially face-to-face communication, has been a robust finding in social dilemma research (e.g., Dawes et al. 1977, see also section 2.2.5). Isaac et al. (1988) pioneered the immense literature on communication by considering non-committal, face-to-face-communication (also referred to as cheap talk) between rounds of iterated games. More recent studies observe that contributions not only can reach 100 %, but also they were sustained in later rounds absent of communication (Messer et al. 2007).

Among the many hypotheses proposed to explain this effect, the group identity hypothesis has been most compelling (see section 6.2.1.4 (p. 97), see also Brewer and Kramer 1986, Dawes et al. 1988, Dawes et al. 1990, and Chen et al. 2007, p. 260)

Bochet et al. (2006) and Messer et al. (2007) also compared several types of communication and punishment schemes as means to increase contributions and efficiency in dilemma situations. Interestingly, the authors find that anonymous communication via chat rooms was almost as effective in increasing contributions and efficiency as face-to-face communications is.

6.2.1.6 Socio-economic Background

Table 8 – Socio-economic Background

has been emphasized in section(s)	(will be) summarized in section(s)	is interrelated with .. (section(s))	has impact on (section(s))	has policy implications (for) ... (section(s))	has a likely effect of:
—	6.2.1.6	5.2.2 6.2.2.6 6.2.2.3 6.2.1.7 6.2.1.8	5.2.4 2.2.7 6.2.2.7	9.1.2.2	+ / —

Source: own compilation.

One major further finding in this survey is that considerable heterogeneity within the population exists (see, e.g., sections 2.2.7 and 6.2.2.7). This makes a subsequent analysis of whether a causal determination can be found in the socio-economic-background⁵⁵⁾ worthwhile. Gächter and Herrmann (2006), for instance, conducted a study with Russian citizens and found that the sociological background

matters decisively for voluntary cooperation. In particular, they found higher levels of voluntary cooperation among rural residents than among urban residents (p. 19).

The authors suggest two reasons for that: First, due to several developmental lags inherited from the past, the gap between urban and rural areas is huge in Russia (and is particularly pronounced in the region of Kursk, where the experiments had been conducted). Furthermore, the rural areas were strongly shaped by collectivism (up to 1991), because economic and social life was dominated by monopolist collective firms. Second, norm enforcement is easier in close parochial communities⁵⁶⁾ than in anonymous large groups with limited and weak monitoring possibilities (see, e.g., Bowles and Gintis 2002 for theoretical arguments). Finally, the authors also find a correlation between the socio-economic background and participants' age: rural residents and mature participants were identified to be more cooperative than urban residents and young people (Gächter and Herrmann 2006, p. 3-19).

Some Trivia: The particularly interesting case of Russia

Gächter and Herrmann (2006) emphasize some peculiarities of the socialization background in Rus-

sia within their study population: People born before 1970 already were adults by the time of the breakdown of the Soviet Union in 1991, and were therefore socialized during communism, whereas people who were 21 at the time of the experiment were only 10 years old when the Soviet Union broke down. These subject pools thus differ in the experiences of their formative years, and, according to the authors, there are “psychological reasons to believe that socialization and experiences in the early adulthood shape people’s pro-social beha-

viours”⁵⁷). Gächter and Herrmann’s (2006) mature participants were socialized in their formative years in a collectivist ideology and economy⁵⁸), while the young urban and rural participants experienced their teenage years after the demise of the Soviet Union, which shaped their experience less by a communist ideology but more by the rooky transition to a market economy with all accompanying sociological changes. Amongst those changes are “widespread perceptions of ubiquitous unfairness in the economic process and a lack of trust⁵⁹) in the rule of law”⁶⁰) (Gächter and Herrmann 2006, p. 3-19).

context. Second, no gender differences could be detected when the price of giving was changed, i.e., both sexes seem to be similarly price sensitive. Third, men and women differ in their reaction to social comparison. While the information that many others contribute to the two social funds does not change the pro-social behaviour of women, it increases the contribution of men dramatically. In other words, men behave stronger in line with average group behaviour, whereas women seem to be insensitive to information about the group behaviour (Meier 2005, p. 11-12).

6.2.1.7 Gender

Table 9 – Gender

has been emphasized in section(s)	(will be) summarized in section(s)	is interrelated with .. (section(s))	has impact on (section(s))	has policy implications (for) ... (section(s))	has a likely effect of:
—	6.2.1.7	2.2.4 2.2.6.1 6.2.2.3	5.2.4 2.2.7 6.2.2.7	8.1.2.3	mixed (on price sensitivity) +/—

Source: own compilation.

Gender and Education

The evidence for effects of gender differences on pro-social behaviour is mixed. However, gender effects on contributions, especially in linkage with other factors like price elasticities, education, criminal behaviour, or environmental morale have been studied. We’ll briefly stress some of these studies.

Ockenfels and Weimann (1997), similar to Selten and Ockenfels (1998), find an interaction between gender and education when studying givings by economists and non-economists. Economists sacrifice significantly less money for reasons of solidarity. A closer look, however, reveals that this effect is restricted to males. This “superimposition of distinct type-effects seems to be stable” (p. 276) and will be addressed more closely in section 6.2.2.3.

Gender and the Price of Giving

Andreoni and Vesterlund (2001, p. 294) investigate in a charitable giving-setting and observe different price elasticities among men and women: “When it is relatively expensive to give, women are more generous than men; however as the price of giving decreases, men begin to give more than women” (Meier 2004, Elliot 1998).

Gender and Crime

Following Torgler et al. (2008), the correlation between gender and criminal or delinquent behaviour has been investigated extensively in the criminology literature. Mears et al. (2000), analyzing several studies, convincingly point out that women are less likely to be involved in corruption, cheating on taxes or other crime compared to men:

Three further clues are provided by results from Meier’s (2005) field study, examining contributions to two social funds: firstly, men are slightly more likely to contribute in a risk-free charitable giving

„at every age, within all racial or ethnic groups examined to date, and for all but a handful of offense types that are peculiarly female... sex differences in delinquency are independently corroborated by self-report, victimization, and police data, and they appear to hold cross-culturally as well as historically.“ (p. 143).

Other effects of gender-specific socialization (the maintenance of life and the environment)

According to Torgler et al. (2008), women’s traditional gender socialization, cultural norms and the role of women as caregivers and nurturers, all lead to a higher concern for the maintenance of life and environment. In addition, women’s traditional domains, like working at home, are said to induce a greater likelihood to engage privately in behaviours aimed at the preservation of the environment (for an overview, see Hunter et al. 2004). This is what Torgler et al’s results confirm: women (at every age) show more concern for the environment than men do. They also volunteer more than men, although political volunteers are more likely to be male (Torgler et al. 2008, p. 4-6).

Other explanations for the predominance of women in social roles come from Henderson (1996) by suggesting that women spend their available leisure time on deeply socialized roles emphasizing the ethics of care⁶¹⁾ (p. 147), ensuring that women conform to the „traditional feminine identities of nurturing, caring, passivity, gentleness.“ (p.148). Torgler et al. (2008) are convinced that these characteristics predispose women to spending their leisure time on activities that are „other-regarded“ and, as a consequence, “are nurturing for society and the environment” (Torgler et al. 2008, p. 6-7).

6.2.1.8 Age

Table 10 – Age

has been emphasized in section(s)	(will be) summarized in section(s)	is interrelated with .. (section(s))	has impact on (section(s))	has policy implications (for) ... (section(s))	has a likely effect of:
—	6.2.1.8	2.2.4 2.2.6.1	3.3 6.2.2.2 2.2.7 6.2.2.7	8.1.2.3 9.3	+ / —

Source: own compilation.

Gächter et al. (2004) observe in a one-shot PGG with 782 subjects (from various cities and villages in Russia and Belarus⁶²⁾ that “the older people are, the less likely they seem to be afraid of being exploited, and this trust (see section 6.2.2.2) in the fairness (see section 7.1) of others is strongly positively correlated with cooperative behaviour. In other words, people who trust that others do not exploit them display a higher voluntary cooperation than those who hold the contrary belief (see section 8.1.2.1). A similar reasoning holds for peoples’ beliefs about other peoples’ helpfulness.” (p. 523). These findings are consistent with evidence that many people are conditional cooperators (see section 2.2.3.3), who are prepared to cooperate if they believe that others cooperate as well.

Increasing norm-compliance but lowered environmental preferences

Further observations come from Torgler et al. (2008), focusing on social norms (in an environmental context). They review studies stressing that age is negatively correlated with the willingness to contribute to environmental protection, since older people will not live to enjoy the long-term benefits of preserving resources⁶³). They argue that the social position is a key explanation of an age effect. Tittle (1980) explains that aged persons have acquired greater social stakes such as material goods, status and a stronger dependency on the reactions from others. This stronger dependency can result in a higher compliance with social norms of pro-environmental behaviour by the recognition of socially appropriate behaviour (Bamberg and Möser 2007). Thus, the potential costs of non-compliance can increase and they observe that compliance increases with age. The literature on tax morale, for example, provides support for this age effect as well (see the discussion of policy implications in section 9 (p. 137f.) and Torgler et al. 2008, p. 7-8).

6.2.2 Systemic Variables

Variables related to the (experimental) environment that are more complicated to control than those discussed in the last subsection, are called systemic variables. While it is straight forward for the experimenter to control the institutional environment with monetary incentives (the payoff structure, section 6.2.1.1), the number of participants (section 6.2.1.2) or participants' gender (section 6.2.1.7), it becomes more tricky when controlling for beliefs (section 6.2.2.1), trust attitudes (section 6.2.2.2), or experience with game situations (section 6.2.2.4), which we will now address.

6.2.2.1 Beliefs

Table 11 - Beliefs

has been emphasized in section(s);	(will be) summarized in section(s);	is interrelated with .. (section(s),)	has impact on (section(s),)	has policy implications (for) ... (section(s),)	has a likely effect of:
2.2.3.1	6.2.2.1	2.2.1 2.2.7 6.2.2.2	2.2.3.1 5.2.3	8.1.2.1 9.2.1 9.3	+/-

Source: own compilation.

Beliefs about others' actions are an interesting example for the progress and advancement of knowledge accumulation in experimental economics. Whereas Ledyard (1995) was still just assuming that "the data on beliefs are the results of surveys but there does seem to be something systematic; subjects with a propensity to cooperate (for whatever reason) also tend to believe others are more likely to cooperate .. I think these ideas deserve to be explored further especially in a way that provides more reliability in the responses to questions about beliefs" (p. 59-60), Gächter et al. (2004), roughly ten years later, find that "people who believe that most others are fair and do not exploit others make significantly higher contributions to the public good than those who believe that they will be exploited by others".

This is in line with our theoretical considerations (sections 2.2.3.3, 4, and 5.2.1.2). Likewise, optimists who believe that others are helpful instead of egoistic also contribute significantly more than pessimists who hold the opposite belief (Gächter et al. 2004, p. 507). These findings are consistent with the observation that most

people do not want to be the “suckers” in cooperative enterprises.

Incentivizing Beliefs

Incentivizing beliefs (in game theoretic terms) means rewarding players financially if their stated beliefs about their opponents’ choices correspond to their opponents’ actual choices. Studying belief incentivizing, Gächter and Renner (2006) get the following three noteworthy results:

1. Incentivizing beliefs increases the accuracy between estimated and actual average contribution of the other group members significantly (measured as the difference between estimated and actual contributions).
2. Incentivizing beliefs does not affect the level and distribution of elicited beliefs.
3. The relationship between beliefs and contributions is highly significantly positive (p. 2).

Belief formation, elicitation and management should thus be of prime interest for policy-makers. We will discuss the importance and its implications in section 8.1.2.1. Belief formation is grounded on trust attitudes, which we will address next.

6.2.2.2 Trust (and motivational Crowding-out Effect)

Table 12 – Trust (and motivational Crowding-Out)

has been emphasized in section(s);	(will be) summarized in section(s);	is interrelated with .. (section(s);)	has impact on (section(s);)	has policy implications (for) ... (section(s);)	has a likely effect of:
—	6.2.2.2	2.2.3.1 6.2.1.1 6.2.1.6 6.2.1.7 6.2.2.1	2.2.3 5.2.1	8.1.3 8.2 9	+ / —

Source: own compilation.

Trust, socio-economic background, fairness and optimism

In section 6.2.1.6 we stressed that the socio-economic background influences trust attitudes, which, in turn, are correlated with the contribution behaviour. Gächter et al. (2004), studying trust attitudes, find that non-students are more trusting than students. Yet, controlling for the socio-economic background reveals that age is more important than the socio-economic status of being a white-collar or a blue-collar-student. When correlating trust attitudes to the decision to cooperate in a PGG, Gächter et al. (2004) find that people “who believe that most others are fair and do not exploit others make significantly higher contributions” to the public good than others believing they would be exploited by others (as already argued in section 5.2). Furthermore, people who trust strangers are also significantly more cooperative in a one-shot-experiment than those who mistrust strangers (p. 507).

Trust, monetary incentives and crowding out of intrinsic motivation

In a laboratory experiment with CEOs, Fehr and List (2002) investigate on the role of trust in a setting with (monetary) incentives. They find that detrimental effects (intrinsic motivational crowding-out) on trust follow from external incentives: if the first player uses an external incentive in a trust game (see subsection 1.3 for game details), the second player returns less money. The highest efficiency is reached if it is possible to implement an external incentive,

but certain subjects explicitly trust in each other, so that they do not use the incentive mechanism. Therefore, while in general trust is crowded out by external incentives, incentives also seem to allow for exhibiting trust when they are explicitly not used

(Fehr and Gächter 2002). The authors interpret the negative effect of incentives in terms of reciprocity, that is, the explicit threat to punish “shirking” is perceived as distrust and a reciprocal agent increases shirking as a response to such a hostile act (see also section 2.2.3, Meier 2004, p. 37, and Meier 2006, p. 32).

Bohnet et al. (2001) conducted an experiment where subjects had to decide whether they wanted to enter a contract without knowing whether the partner would perform. Economic theory expects that a higher probability of contract enforcement will increase contract performance. The authors, however, report a crowding-out effect: in a situation of weak contract enforcement, trustworthiness (i.e., people do perform contracts) is higher than in a situation of medium contract enforcement. Only if contract enforcement is increased well past the medium mark, contracts are performed again. These findings support the notion that medium or low incentives can crowd out trust and intrinsic motivation (see also section 2.2.6.2).

Trust, Gender and Ethnicity

In their study about trust and trustworthiness, Bohnet and Baytelman (2007) find that in most games, women are willing to trust less and expect to get back less than men. Further findings include that whites often trust and expect back more than non-whites, whereas there are no differences between Americans and non-Americans. There are generally “no significant differences in the willingness to be trustworthy or expectations to be sent between whites and non-whites” (Bohnet and Baytelman 2007, p. 109).

6.2.2.3 Education and Economics Training

Table 13 – Education and Economics Training

has been emphasized in section(s)	(will be) summarized in section(s)	is interrelated with .. (section(s))	has impact on (section(s))	has policy implications (for) ... (section(s))	has a likely effect of:
—	6.2.2.3	6.2.2.4 6.2.2.5	8.1.1	8.1 8.2	—

Source: own compilation.

There is widespread criticism that economics training erodes pro-social behaviour (e.g., Frank et al. (1993a, 1993b, 1996), Yezer et al. 1996). Especially in recent years, as corporate illegal activities have been uncovered, critics held business schools and economics education at least partly responsible for this unethical behaviour. More generally, it is widely believed that economics training reduces cooperative behaviour (see, e.g., Selten and Ockenfels 1998 or Ockenfels and Weimann 1997). This claim has been tested not only based on questionnaire data about attitudes or lab experiments, but also in the field. Meier (2004) analyzes whether economic education has a negative effect on pro-social behaviour (with a sample size of 33.000 students). In general, there are large differences between the students of the different faculties, supporting the view that people are heterogeneous in their pro-social preferences. Meier’s data and results confirm that students of economics behave more selfishly than the average non-economists.

However, this behavioural difference may also be due to a selection effect: selfish persons may choose to study economics. To be precise, selfish persons select business administration in particular. According to a study published in *The Economist* (1993, p. 71), it is therefore not true that “economists are an unpleasant lot” (see also Meier 2004, p. 164), but that business economists are. The empirical analysis could not detect an

indoctrination effect of economics training on top of the selection effect. This means that academic economists do not create the type of selfish persons (the Homo Oeconomicus) they axiomatically assume in their theories (Meier 2004, p. 164).

6.2.2.4 (In)Experience

Table 14 – (In)Experience

has been emphasized in section(s);	(will be) summarized in section(s);	is interrelated with .. (section(s));	has impact on (section(s));	has policy implications (for) ... (section(s));	has a likely effect of:
—	6.2.2.4	6.2.2.3			mixed (—)

Source: own compilation.

As a natural explanation for a (large) rate of contributions (40 % to 60 %) in many VCM-experiments, Andreoni (1988) suggests that it could be found in the inexperience of subjects. He argues that if one must contribute a number between 0 and 100 and does not understand the implications of the act, then a natural choice is somewhere in the middle. In newer publications (e.g., Hichri 2002), however, this phenomenon has been explained as a result of some more purposeful behaviour (e.g., altruism or reciprocity) and not as simply the result of confusion or inexperience; thus we'll not pursue this argument any longer.

Experience in terms of contributions of subjects who have previously participated in similar experiments (and therefore gained knowledge and do more easily understand the situation) have been found to contribute less than those who are first-timers but contribute still more than zero (see Isaac et al. 1984, Palfrey and Prisbey 1993). However, Palfrey and Prisbey (1993) also suggest that experience does not actually have a significant effect on the percentage rate of contributions, because, although experienced subjects contribute less, they also make fewer errors. They also find that experienced subjects are more responsive to MPCR (see 6.2.1.1), whereas two other studies, which control for experience this way (Marwell and Ames 1981, and Isaac et al. 1988), find no significant effect (Led-yard 1994, p. 41f).

6.2.2.5 Learning (and Confusion)

Related to the above, previous studies have focused on aspects of individual behaviour like learning. Learning models (e.g., reinforcement learning, experience weighted attraction learning) are based on the idea that subjects learn and actualize their strategies and choices while playing a game, which leads to an observed change in behaviour owing to experience (Hichri 2002, p. 3f). However, no significant effect on contributions should be expected.

Research that followed (on altruism theories) showed that a large portion of cooperative behaviour cannot be explained by peoples' confusion with the game, and should be attributed to their taste for cooperation (Andreoni 1993, Palfrey and Prisbey 1997, Leanne Ma et al. 2000).

Table 15 – Learning (and Confusion)

has been emphasized in section(s)	(will be) summarized in section(s)	is interrelated with .. (section(s))	has impact on (section(s))	has policy implications (for) ... (section(s))	has a likely effect of:
—	—	6.2.2.3 6.2.2.4		*	0

Source: own compilation.

* Note that the statements made below are not in line with those made in sections 9 and 10 (policy implications), where learning has proved to have effects (e.g., in the field of environmental behaviour). This is due to the fact that below learning is understood as actualizing strategies in (laboratory) game play, while in sections 9 and 10, learning is attributed to peoples’ (learning) progresses in the long-run.

6.2.2.6 Cultural Values and Differences

Table 16 – Cultural Values and Differences

has been emphasized in section(s)	(will be) summarized in section(s)	is interrelated with .. (section(s))	has impact on (section(s))	has policy implications (for) ... (section(s))	has a likely effect of:
2.2.7	6.2.2.6	6.2.2.7	6.2.2.2	.. is of general importance e.g, 8	+ / —

Source: own compilation.

Hagen and Hammerstein (2006) report increasing evidence that culture plays an important role in the explanation of game results. An intriguing finding from cross-cultural studies is that game play in many societies seems to reflect local social and economic institutions (Henrich et al. 2005). Whereas in one of the first cross-cultural comparisons in UG behaviour, Roth et al. (1991) discovered only minor differences in the distributions of offers and acceptances between student populations in Pittsburgh, Tokyo, Ljubljana and Jerusalem, Henrich et al. (2005) observe, for example, in the New Guinean societies of Au and Gnau, that accepting a gift creates a strong obligation to reciprocate, often in ways that the receiver finds onerous (Gurven et al. 2007). What follows if the receiver fails to reciprocate is that he finds himself in a subordinate social position. Consequently, large gifts are often refused. Perhaps not coincidentally, in these societies and unlike many other societies, large, hyper-fair offers exceeding 50% are frequently rejected in the UG (Hagen and Hammerstein 2006, p. 345).

The findings of low offers in Henrich’s (2000) and Henrich et al. (2005) in combination with few rejections in the UG, and low contributions in the PGG among the Machiguenga, a group of Peruvian forage farmers, let Gurven (2004) suggest that the “cultural trajectory associated with a traditional, non-market oriented subsistence economy may lead to very different outcomes.” (p. 7).

Subsequent tests by anthropologists and economists working in similar traditional communities in Africa, Indonesia, New Guinea, and South America have revealed an even broader spectrum of offers and rejections in the UG and of contributions in the PGG (Henrich et al. 2005).

Due to the relatively scarce levels of integration to the market in many of these traditional societies, it has been argued that living in large populations with a market environment somehow favours ‘divide equally’ and ‘punish selfishness’ (Henrich et al. 2005, Gurven 2004, p. 7) In other words: game results obtained from traditional populations, where daily cooperation is often viewed as a crucial component of subsistence strategies, are closer to the self-interest predictions than the results from games played among industrialized, western populations with a long history of market economies (and market integration). Gurven summarizes that “thus, this and other similar studies raise more questions than answers” (Gurven 2004, p. 21).

Races and Nationalities

Ayres and Siegelman (1995) observe in their field studies that market outcomes depend systematically on the races of the parties involved. In an experimental study, Weimann (1994) finds that American students are less cooperative than Germans when they interact repeatedly. Burlando and Hey (1997) use the same approach and examine cooperation behaviour of British and Italians. They find that British subjects free ride to a significantly larger extent than Italians do.

Ockenfels and Weimann (1997), studying differences between East- and West-Germany conclude:

“Cultural background seems to have a strong influence on individual cooperation and solidarity behavior. The underlying process leading to the observation that eastern subjects behave more selfishly than western subjects is unclear. One might think that eastern subjects have grown up in a socialistic system which produced a social dilemma: individual effort to expand production was not rewarded and therefore not rational. Each person had to develop strategies to overcome the scarcity resulting from the unsolved dilemma. This might lead to solidarity and cooperation in small non-anonymous groups such as families or near friends on the one hand, but to egoism in large anonymous groups such as in firms, on the other hand. Note, that our experimental designs established anonymity through double blind settings. Furthermore, after the unification, selfish behaviour might be considered as “typical” in a

free market-oriented system, and this might “justify” selfish behaviour.” (p. 276).

What experimental economists can learn from the observation that different behavioural patterns exist is that they should be careful in composing their subject pools. Camerer and Fehr (2002) and Meier (2004), for instance, have emphasized that different types may decide differently (see next subsection). In this respect, Ockenfels and Weimann (1997) emphasize that the distribution of subject pools over culture and nationality, sex, origin, etc., is an important property and should be taken into account “when judging experimental data and extrapolating from laboratory behaviour to other contexts.” (p. 276).

6.2.2.7 Heterogeneity (win)in Individuals

Heterogeneity within individuals has been a major insight in social dilemma research as well as a topic in this survey (discussed in sections 2.2.7, 4, 5.2.2, 6.2.1.4 and 6.2.2.6). Given the wealth of experimental observations, the implications of a systematic connection between types and behavioural patterns will be summarized in section 7.1.

6.2.3 Institutional Design Variables

6.2.3.1 Punishment

Punishment is a main topic within this work. Implementations of punishment possibilities range from direct punishing (within participants in a certain decision situation) to third-party punishment and spiteful (revenge) punishment, or counter-punishment (which, if allowed for, can comprise up to 25% of all punishments, see section 7.5 for further details).

Table 17 - Punishment

has been emphasized in section(s)	(will be) summarized in section(s)	is interrelated with .. (section(s))	has impact on (section(s))	has policy implications (for) ... (section(s))	has a likely effect of:
3.1.1	5.2.4	7.5 7.6	.. is of general importance	.. is of general importance, e.g., 9.1.1.2	++

Source: own compilation.

Degree and Frequency of Punishment

Types of punishers (empirics)

Carpenter (2007) distinguishes five basic types of punishers. The distribution is as follows: 6 % are free riders who punish cooperators, 17 % are free riders who never punish, 32 % are free riders who punish other free riders, 15 % are contributors who do not punish, and the remaining 30 % are contributors who punish free riders. The author calls the first group principled free-riders, the third group as hypocritical free riders, and the last group as principled cooperators (p. 532).

A slightly different nomenclature was introduced by Carpenter and Matthews (2002). They consider five agent types in games with punishment possibilities:

- (1) Free Riders: don't contribute and don't punish,
- (2) Second Order Free Riders: contribute, but never punish,
- (3) Strong Reciprocators: contribute and punish in-group free riders only,
- (4) Pure Social Reciprocators: contribute and punish out-group free riders only,
- (5) Social Reciprocators: contribute and punish free riders in both groups,

(Carpenter and Matthews 2002, p. 11).

In their experiment, about 30% of the participants consistently punish both outside and inside their groups, about 50% punish in-group only, and the remaining 20% effectively never punish at all (p. 13).

Gächter and Herrmann (2006) in their study get three noteworthy results regarding the degree and frequency of punishment with different subject pools: they controlled for people who were members of voluntary organizations and found that these punished weakly significantly more spitefully than people with no memberships to voluntary organizations did. Furthermore, they controlled for people with a university degree and compared their punishing behaviour to that of people without a university degree: the former weakly significantly punished more than white-collar workers. Gächter and Herrmann (2006) thus conclude, "higher degrees of education did not lower spiteful punishment, which also suggests that spiteful punishment was not due to confusion." (p. 19).

6.3 Variables affecting Contribution Behaviour at a Glance

As a summary for Chapter 6, experimental research has discovered contextual variables (collected as "stylized facts") that shape individuals' operating motives. The following Table 18 presents their likely direction and (ordered by their) relative strength (strong and weak positive or negative impact) on the change in total contributions as a percentage of the efficient level. The usual annotations this time in Ledyard's (1995) words: "Some effects are more certain than others, in that replication has confirmed initial findings. Understanding behaviour would be easier if each of these variables had a separable and identifiable effect on contributions." (p. 37)⁶⁴.

Table 18 – Variables affecting Contribution Behaviour at a glance

Source: own compilation based on the structure of Ledyard (1995).

I	Strong positive or strong negative effects (depends on concrete implementation)	abbreviation:
	<ul style="list-style-type: none"> • (Increase or Decrease in) marginal per capita return (MPCR), the “price of giving” and “rebates” • Communication (structured and relevant) • punishment 	++ or --
II	Strong positive effects	abbreviation:
	<ul style="list-style-type: none"> • reciprocal inclinations (conditional cooperation) • altruistic inclinations 	++
III	positive or negative effects (depends on concrete implementation)	
	<ul style="list-style-type: none"> • common knowledge • homogeneity (symmetry (+) and heterogeneity (-) in information and endowment • Friendship, Group identification, peer recognition • beliefs • property rights • thresholds / provision points • number of tokens (initial endowment) • visibility of actions • gender • age • cultural differences 	+ or -
IV	Strong negative effects	abbreviation:
	<ul style="list-style-type: none"> • Repetition • Anonymity 	--
V	Negative effects	abbreviation:
	<ul style="list-style-type: none"> • Economics training • (In)Experience • Unanimity 	-
VI	Likely no effect	abbreviation:
	<ul style="list-style-type: none"> • group size • learning and confusion 	0
VII	Unknown effects	abbreviation:
	<ul style="list-style-type: none"> • Effort • Risk Aversion • Moral suasion 	?
VIII	Not separable but strong (positive or strong negative) cross-effects	abbreviation:
	<ul style="list-style-type: none"> • institutional framing (context dependence in form of grouping individuals according to certain inclinations) • heterogeneity (with)in individuals 	C+ C-

7 Summary

Several models in the social sciences go a step beyond rational choice theory by explicitly incorporating others' welfare as important components of individual utility functions (chronologically amongst others Bolton 1991, Rabin 1993, Bergstrom 1996, Fehr and Schmidt 1999, Bolton and Ockenfels 2000, Fischbacher and Gächter 2006). One productive avenue of research that has made great dents in the Homo Oeconomicus framework is that of experimental economics. Several of the simplest and most common economic games which produce results at odds with self-interest predictions are the Ultimatum Game (UG), the Dictator Game (DG), and the Public Goods Game (PGG). While the results of these games have been shown to vary under different experimental conditions (see the reviews by Ledyard 1995 and Roth 1995), they also show several robust results (see subsections 6.2 for details and 6.3 for results at a glance) across many treatments. They repeatedly show that the rational, self-interested profit-maximizer rarely "rears its selfish head"⁶⁵⁾ (Gurven 2004). Thus, few scholars who consider individuals as heterogeneous (see subsection 7.1) and free decision-making agents, sensitive to the costs and benefits of various behavioural options, still adhere to the notion that humans act according to strict rational self-interest. Much theoretical and empirical work also outside the tenets of economics and (social)psychology in socio-biology, behavioural ecology and lately in neuro(economics⁶⁶⁾ and –sciences over the past thirty years have forced researchers to conclude that costly acts conferring benefits on others are not simply anomalies to be explained away as exceptions to the self-motivation hypothesis (Gurven 2004)⁶⁷⁾.

Recent work in behavioural economics include examinations of the sacrifices that people are willing to endure to assure fair outcomes, and, in this sense, scholars have sought to understand norms like reciprocity (see subsection 7.4) or norm-enforcement mechanisms like punishment (see subsections 6.2.3.1 and 7.5, Carpenter 2007, p. 523). The public goods game with a punishment opportunity can be viewed as the paradigmatic example for the enforcement of a social norm (see subsection 7.6). Social norms often demand that people give up private benefits to achieve some other goal. This raises the question of why most people obey the norm. The evidence above suggests an answer: Some players will punish those who do not obey the norm (at a

cost to themselves), which enforces the norm (Camerer and Fehr 2002, p. 13).

Painting in broad strokes, understanding punishment and reciprocity, in particular, is important because it provides the theoretical foundations to answer the puzzle of how cooperation can evolve and be sustained in large groups (in comparison to the common lab environments), like, e.g., in neighbourhoods (Carpenter and Matthews 2002, p. 13). An intuitive (evolutionary) argumentation is brought forth by Gurven (2004): "There is little doubt that humans everywhere have worked out cultural ways (norms) of attaining gains from cooperative ventures, and that these cultural methods might require some universals of human cognitive machinery, including abilities to detect and punish cheaters. Because cooperation is usually costly in terms of time, energy, or other resources, there are strong incentives to control free-riding in cooperative ventures" (p. 22).

There is plenty of evidence linking cooperation in one-shot dilemmas to a general pro-social value orientation and to benevolence values like social responsibility, moral obligation or in-group-favouritism (see chapter 3). Some people (~ 50 - 60 %) have a cooperative⁶⁸⁾ social value orientation (usually referred to as pro-socials). For pro-socials, equal distribution is a fundamental goal and equality is a highly prioritized value (Biel and Thøgersen 2007).

In addition to inequality aversion, models that introduce other motives like envy and spitefulness (Fehr and Schmidt 2003) could help understand why people, on the one hand, behave altruistically towards others worse off than they are, while on the other hand they punish those who are better off than they are (Meier 2004, p. 20). Charness and Rabin (2002), for example, found in a game with unequal payoffs, that there is "a strong degree of respect for social efficiency, tempered by concern for those well off" (p. 849), i.e., the more unequal but social efficient outcome is often chosen. Whether people are more concerned with social welfare than with inequality has to be investigated further (Meier 2004, p. 21) but brings us to one key-insight of this work: there is considerable heterogeneity among individuals. Which implications this bears in form of motivations for pro-social behaviour is what we discuss now.

7.1 Implications of Heterogeneity in Individuals

We discussed individual differences in humans in sections 2.2.7, 4, 5.2.2, 6.2.1.4 and 6.2.2.6 and can derive three important implications (following Meier 2006, p. 24-26).

1) The interaction of different types of people is crucial to an understanding why cooperation is stable and why public goods are provided. Consider, for example, the situation in which an egoistic individual is interacting with a reciprocal individual, i.e., the coexistence of both types. The presence of a reciprocal individual may change the material incentive of the egoistic type and thereby cause the egoist to behave pro-socially⁶⁹).

The presence of only a few reciprocal types may have a big impact on the aggregate out-come of markets and organizations (see the survey in Fehr and Fischbacher 2002; how-ever, also the opposite is possible, see chapter 10.2). Whether a pro-social individual will cause an egoist to behave pro-socially, or, conversely, a few egoists will cause pro-social individuals to start free-riding, is a question that depends crucially on the institutional setting. However, in order to analyze the institutional factors that lead to one or the other of the two outcomes, one has to understand how heterogeneous individuals interact.

2) The institutional environment may influence individuals differently (see also 7.3). In analyzing the effect of a change in institutional settings, it is important to take the heterogeneity of individuals into account. Meier (2005a) presents evidence from a controlled field experiment, showing that only certain types of people react to a change in relative prices. In addition, people may react quite differently to the introduction of monetary incentives with respect to their motivation to behave pro-socially (motivational crowding-out, see also 2.2.6.2).

3) Understanding (the evolution of) heterogeneous pro-social preferences can also help to understand how pro-social preferences can be fostered. According to Meier, little is still known about this question in economics. One prominent position, however, is that students of economics are often portrayed as being more egoistic than those majoring in other fields, partly because their training changes their behaviour (see Frank et al. 1993a and 1996, and section 6.2.2.3). Teaching them

some ethics is therefore assumed to make them better citizens and better future managers.

7.2 Appropriateness of different Theories of other-regarding Preferences in explaining Behaviour

A number of important phenomena and puzzles, however, cannot be explained by the sole presence of individuals with other-regarding preferences. Meier (2004, p. 30-32) reports on a number of exclusively experimental studies that attempt to discriminate between the various theories of pro-social behaviour (see also Fehr and Schmidt 2003), in which the results are mixed with regard to which model best explains such behaviour. While, for example, reciprocity models are shown to explain behaviour in various public good situations, in other situations, e.g., Dictator Games, pro-social behaviour cannot be due to reciprocity. Similarly, some experiments show that people are motivated by inequality aversion, while others support the notion that people are concerned with overall efficiency independent of equality. Also, altruism and group-regarding behaviour cannot explain all data: when the conflict between group interest and self-interest is removed, subjects still contribute in ways that are counter to both their self-interest and their group interest (Ledyard 1995, Saijo and Yamaguchi 1992). It is too early to conclude whether one theory is most appropriate to explain pro-social behaviour (Meier 2004, p. 30) as still too little field evidence exists to be able to discriminate between the various theories. An exception is the empirical evidence that government grants do not completely crowd out private contributions to public goods, which supports the notion that people cannot be solely motivated by pure altruism⁷⁰).

The divergent results also show that there is no single motive that can explain pro-social behaviour in general. More likely, the aforementioned motivations are conditional on specific situations. The empirical evidence mentioned in sections 5 and 6 point out some conditions which trigger certain motives. Of course, other factors matter as well, such as the degree of anonymity, whether communication is possible, whether the decision is repeated, how large the marginal returns on contributions are, what the size of the group is and so on. The salience of interdependent utility in small groups is likely to be an important reason why reciprocity is crucial in this context. Everybody knows that free riding of a mino-

city decreases the individual's pay-off. However, in situations where interdependence is not as salient, conditional cooperation may not be as important. For example, whether your neighbour contributes to the World Wildlife Funds or not does not obviously influence your well-being (Meier 2006).

In the case of charitable giving or 'dictator game'-situations, reciprocity is less important and sometimes even not possible due to the decision situation. It is hard to imagine that a street child in Brazil will ever reciprocate a donation. Altruism and 'warm glow' giving can, however, explain the large amount of money donated. The probability of pro-social behaviour increases with the degree of identification (Bohnet and Frey 1999b) and with the neediness of the recipient. Altruism and 'warm glow'-giving is very sensitive to contextual factors, because with a slight variation in the institutional environment, the expected 'warm glow' can change.

The same can be said about the more general phenomenon of intrinsic motivation. As discussed in section 2.2.5, the design of institutions can dramatically influence the intrinsic motivation to behave pro-socially. Whether people think that their contribution behaviour is voluntary or whether they perceive it to be enforced is an important factor in the pleasure they get from pro-social behaviour and ultimately influences the extent of such behaviour.

In sum, there is still a lot to learn about the motives for pro-social behaviour. Meier (2004) emphasizes that "the focus has to be more on which conditions may trigger the various motives for pro-social behaviour" and "more field evidence needs to complement the findings from laboratory experiments" (p. 32).

7.3 Institutions

Institutional factors have come to be identified as important determinants of economic behaviour (see especially sections 2.2.5 and 5.2.3) in serving three important purposes:

- institutions should make individuals' behaviour predictable⁷¹),
- in that institutions' design should allow to manipulate peoples' behaviour, e.g., by keeping people from being too selfish and not pursuing societies' interest,
- to protect and nurture individuals' intrinsic motivation, their civic virtue, their willingness to trust

and be trustworthy absent material incentives, in order to elicit contributions, and

- by providing a salient framing (context) of the decision situation (Bohnet and Baytelman 2007, p. 115).

The context (framing), in which a decision is made, crucially influences whether engaging in a pro-social activity. The context might allow people to attribute the same decision to either a greedy or an altruistic trait, thereby affecting the decision in the first place⁷²). Thus, from a policy perspective, the institutional environment may be used by authorities to influence social preferences when they prescribe and enforce social norms. We will outline this in section 9.1.1.

Consequently, the working definition of framing has been expanded to incorporate norms, perspectives, contexts, and other social and cultural elements. According to Zajac (1995, p. 105 f.), institutional framing is grounded in North's conception of institutions: "Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction" (North 1990, p. 3). Framing is then a manipulation of factors causing a change in an individual's frame such that predictable behaviour is affected (Elliot et al. 1998, p. 455).

Recommendations for broadening both experimental and theoretical analyses to include institutional framing are occurring more frequently in the literature. Frey and Bohnet (1995) issue a general call for institutional experimentation: "We thus appeal for a closer integration of institutions and experiments and believe that institutional and experimental economics may profit greatly from each other, opening up new insights for the understanding of social reality" (p. 300). Incorporating institutional frames into economic predictive models of choice may be essential to understanding when (and why) the standard self-interest model fails to explain economic behaviour⁷³) (Elliot et al. 1998, p. 455-456).

7.4 Reciprocity (Fairness)

Widely recognized, reciprocal altruism leads to a high level of cooperation in social dilemma situations. Especially has reciprocity become the most plausible explanation on the question why contributions decline over time, which is that each group has

a mixture of subjects who behave selfishly and others who behave reciprocally. The reciprocal subjects are willing to cooperate if the other group members cooperate as well.

An illustrative area for the study of reciprocity and fairness principles are labour relations: numerous studies, both theoretical and empirical, have argued that reciprocally motivated individuals respond to fair treatments such as higher wages with higher levels of motivation and work effort (see, e.g., Akerlof 1982, Bewley 2000, Fehr and Falk 1999).

Standing for the aforementioned studies, a recent work by Dohmen et al. (2006) is selected to provide empirical evidence on whether there is a systematic relationship between the perceived fairness of labour contracts and the work effort⁷⁴ employees provide. The results obtained are strongly consistent with the fair-wage-effort hypothesis⁷⁵: they find a significantly positive correlation between the degree of positive reciprocity and effort on the job, whereas the impact of reciprocity is comparable in size to that of other important variables. One additional point on the positive reciprocity scale, for instance, has the same effect on hours worked as an additional year of experience, or half a year of additional education. The authors were also interested in whether a relationship between absenteeism and reciprocal inclination existed. Interestingly, they find that positive reciprocity has no impact, but negatively reciprocal types are significantly more likely to take sick days.

A final result in their study concerns a key labour market variable, namely unemployment. Dohmen et al. (2006) discuss arguments based on lab evidence and theories of social preferences, which suggest that individuals who are positively reciprocal may be better able to maintain long-term employment relationships, whereas negatively reciprocal individuals⁷⁶ may be more likely to be unemployed. They find evidence supporting this hypothesis: the unemployed are in fact significantly less positively reciprocal, and significantly more negatively reciprocal. In terms of magnitude, one additional point on the reciprocity scale has about the same impact on the probability of being employed as half a year of education.

How successful is Homo Reciprocans?

Dohmen et al. (2006, p. 3ff) leads this to investigate whether Homo Reciprocans is more “successful” than his non-reciprocal fellows are⁷⁷. Since reciprocally

individuals are willing to reward and sanction fair or unfair behaviour even if this is costly to them, one might speculate that Homo Reciprocans has a strategic disadvantage, because of the resources “wasted” for rewards and sanctions. On the other hand, the authors state that “we know from evolutionary game theory that if one’s own type can be signalled, it can be an advantage to credibly signal that one is willing to punish unfair behaviour or to reward fair treatments” (p. 4). For example, firms that expect reciprocal actions by their workers may have a reason to pay higher wages or to treat workers with respect (Akerlof 1982, Bewley 2000). Likewise, groups consisting of a sufficient number of reciprocators will find it easier to enforce the voluntary provision of public goods, which may result in higher efficiency (Fehr and Gächter 2000, Dohmen et al. 2006).⁷⁸

7.5 Punishment and (spiteful) Counter-Punishment

Cheating is unfair. In the presence of selfish subjects who never contribute, reciprocal subjects gradually notice that they are matched with free-riders and refuse to be taken advantage of (Camerer and Fehr 2002, p. 11). It has been demonstrated that people dispose of a very sensitive cheater detection mechanism (Cosmides and Tooby 1989) and most people hold strong punishing sentiments if they suspect others to have cheated on an earlier premise (Fehr and Gächter 2000, Engel 2007, p. 4). They tend to punish anti-social behaviour, at a cost to themselves, even when the probability of future interactions is extremely low, or zero (Gintis 2000, p. 15). However, the relative price effect is active as well (see, e.g., Sefton et al. 2006): the more inexpensive punishment is, the more it is used (p. 18).

Spiteful punishment and counter-punishment

Nikiforakis (2008) examines how cooperation and group welfare are affected when agents are given the ability to take revenge for punishments. He finds that one quarter of all punishments are retaliated. Individuals who counter-punish seem to be motivated by a desire to hurt those who hurt them, but also use counter-punishments strategically to discourage future punishments. The threat of revenge weakens cooperators’ willingness to punish free riders and

leads to the breakdown of cooperation. The benefits from higher cooperation are insufficient to offset the punishment. This is supported by results of Page et al. (2005) and Gächter and Herrmann (2006). The latter state that “spiteful punishment can undermine the positive impact of punishment for cooperation and thereby limit the success of self-governance.” (p. 19).

What conclusions can we draw from these results? Cooperation cannot be sustained in the presence of counter-punishment opportunities. As counter-punishment opportunities exist almost in every decentralized interaction where punishment opportunities exist, the results question the belief that individuals can govern themselves through punishments, and lend support to the widespread existence of central authorities (Nikiforakis 2008, p. 110).

More aspects and their policy implications will be addressed in section 9 (p. 137 ff).

7.6 Social Norms

No human societies exist without social norms, that is, without normative standards of behaviour that coordinate interactions between individuals and which can be enforced by (in-formal) social sanctions⁷⁹). In section 3, the discussion on social norms focussed on how norms are activated. Yet, two additional dimensions are of importance. The questions how norms, once evolved, are held in place, and, which economic purpose norms serve.

Following Young (2006), three different mechanisms exist by which norms are held in place:

1. Norms are maintained because of some kind of coordination motive.

When driving on the left lane is a norm, everybody will adhere to the norm in order to avoid accidents. These phenomena are held in place by shared expectations “about the appropriate solution to a given coordination problem, but there is no need for social enforcement” (p. 4).

2. Norms are sustained by a threat of social disapproval or punishment towards norm violators (see Sudge 1986 or Coleman 1990).

When waiting patiently in a queue is the norm, those who push their way through to the front, may be censured.

3. Norms and associated enforcement mechanisms arise through the internalization of norms of proper conduct.

When not littering is the norm, avoiding littering even in situations when no one can see oneself should be undertaken. Norms often take on the character of virtuous or right action (Hume 1739, 1978), and deviations from norm-guided behaviour can evoke emotions of shame or guilt even when third party enforcement is absent (Coleman 1990). This fact is especially useful in large societies, where it may be difficult to monitor norm compliance and that entail sanctions by third parties (Young 2006, p. 3, see also sections 9 and 10).

A particularly interesting aspect of norms of proper conduct is its “welfare consequences”, as pointed out by Young (2006): “consider norms of etiquette, such as the fine points of table manners. The welfare consequences are so trivial that it is hard to see why anyone bothers with them. No one is harmed, for example, if I wear a hat to dinner or eat peas with my fingers. The fact is, however, that such indiscretions may do serious harm to my reputation. In particular, they signal that I am a person who does not care about social norms, which may lead others to doubt my reliability in more important interactions (Posner 2000). Complex social rituals allow people to signal their sensitivity to norms in general; they also provide a training ground for learning to follow norms, and for disciplining those who fail to do so.” (Young 2006, p. 4-5).

The economic purpose of social norms

What economic purpose do norms serve? According to Wärneryd (1994), norms coordinate expectations, and thereby reduce transaction costs in interactions that possess multiple equilibria. In typical market transactions, although incomplete contracts are prevalent (i.e., risks exist that the contract is not performed), it is not usually expected to turn to the legal system in order to ensure that the terms of the transaction are fulfilled. Instead, informal (often implicit) agreements, regulated by social norms, govern a large part of the everyday transactions in an economy. In developing countries, as Guttman (2001) states, where the State and the legal system are relatively weak, cooperative social norms are important in particular. However, the stability of such norms poses a problem for economists: Why do

the selfish uphold cooperative norms when such norms typically constrain them from maximizing their utility? An explanation has been given in the discussion on self-interest-theories (section 2.1): rational individuals uphold cooperative social norms in order to preserve reputations for trustworthiness, which are valuable for their market and non-market interactions (Guttman 2001).

8 Societies Quest for socially beneficial (individual) Behaviour

Finding ways to overcome free-riding incentives in the provision of public goods has long been the goal of societies and policy-makers. While governments in general have the authority to impose taxes or other coercive mechanisms, many private organizations do not and must rely on voluntary mechanisms to provide the desired goods or services. Lacking the power to enforce giving, such fundraisers regularly link the public good provision with private benefits, and, for example, make use of lotteries or charitable auctions (see, e.g., section 2.1, Goeree et al. 2004, Morgan and Sefton 2000 or Lange 2006). The studies we reviewed in Part I indicate that such mechanisms can indeed increase the provision level of the public good.

More appealing, however, seem the promising results on conditional cooperation, which emphasize the voluntary nature of engaging in the provision of public goods. In many policy fields, such as the management of international common pool resources (e.g., climate change), where supranational enforcement of contracts is difficult, policy instruments to elicit voluntary actions are crucial.

This and the next chapter pick up examples of several strands of research and try to put them into a more general context, outlining some possible answers on the question which implications for public policy and management can be derived from our behavioural patterns. A special interest lies in assessing the economic and social consequences of reciprocal behaviour. For instance, particularly important economic implications of reciprocity concern labour relations, i.e., effort in the workplace (Gächter 2006, Dohmen et al. 2006, Frey 1993, Akerlof 1982, Meier 2006b), political “logrolling” (a number of examples can be found in Cialdini 1993), tax compliance (see section 9.2), or the willingness and conditions under which support for the welfare state

can be achieved (see section 9.3.1). Before we turn to these concrete policy fields, we start with a discussion on how authorities (and decision-makers in general) can promote socially desirable behaviour (section 8.1). There are some important prerequisites and suppositions, which - taken into account - are able to elicit an astonishing potential of voluntary willingness to act for the good of society (section 8.1.2). Section 8.2 summarizes some possible recommendations for corporate and intra-governmental decision-making.

8.1 Options for Authorities to foster desirable (pro-social) Behaviour

In one of her latest papers, studying environmental affairs, Elinor Ostrom (2006) states:

“[...] at a more general level, our experiments, along with field research and theoretical efforts, lead us to posit that the crucial variables to enhance cooperation in regard to common-pool resources and other forms of collective action are those that enhance reciprocity, individual reputations, and trust.” (p. 161).

Underlying this argumentation is the notion that repeated interactions, where participants gain trust that others are trustworthy and engage in reciprocal relationships, lead to high levels of performance. Field research shows that many rules adopted by local resource users (and sometimes denigrated by policy analysis) affect reciprocity, reputations and trust. Large groups with the authority to make their own rules tend to create nested decision-making units, so that smaller units can engage in effective communication and decision making about aspects of a smaller subsystem (Ostrom 2006, p. 161)⁸⁰. We will address aspects of federalism, i.e., centralization versus decentralization and self-governance versus externally imposed regulations in section 9.1.2. For now, we will stick with the question what authorities can do to promote and maintain desirable behaviour within their citizenry.

8.1.1 Investment in Social Capital

Up to now, policy implications have been annotated unsystematically throughout this work. To aggregate important results, let us start with an illustrative example for determinants of voluntarism and the importance of investment in social capital to elicit

voluntary actions that Torgler et al. (2008) study in the field of environmental policy-making.

Voluntary norm-compliance in the field of environmental phenomena, such as no littering on beaches (as discussed in section 7.6) is primarily being driven by social norms or preferences for environmental protection (see also chapter 4). Such a willingness to contribute to the environment is especially useful in situations where it is extraordinarily expensive to arrange an enforcement regime. As a consequence, voluntary compliance lowers the cost of government's operations.

Torgler et al. (2008) investigate whether there exist gender, age, educational or parental effects in the expression of environmental preferences. The strength of their paper is the use of a large micro-data set covering 33 different countries (provided by the European Values Survey 1999/2000). They explore both the willingness to contribute private money and to agree to pay higher taxes in environmental matters. Second, these effects are examined regarding the influence of individuals' willingness to free-ride and to participate in some kind of voluntary environmental organization (i.e., membership or voluntary work). Third, they investigate the social norms of compliance or environmental morale focusing on the justifiability of littering.

Their results indicate that women have a stronger preference towards the environment and a stronger willingness to contribute. Moreover, they observe the tendency of a negative correlation between age and environmental preferences⁸¹). However, age exerts a positive effect on social norms (environmental morale), indicating an obvious difference between social norms of compliance and environmental willingness to pay higher tax or to give contribute private money.

One crucial implication of these findings is that they can usefully be employed in policies to create and maintain social capital⁸²) to better preserve the environment. As a consequence, it is important that governments, international agencies, and other organizations accept and understand that investment in the creation of social capital pays off (Torgler et al. 2008).

Regarding the effect of education, the authors note that the literature indicates formal education⁸³) to have a significant positive influence on the willingness to contribute to environmental quality. However, informal education is also important and is being regarded in the analysis by a self-reported tendency to discuss political matters (as a proxy). "Well-infor-

med citizens are more aware of environmental issues and problems and have stronger environmental attitudes, because they are more knowledgeable about the possible damage" (Torgler et al. 2008, p. 20).

Finally, and most important for (political) decision-makers, any efforts made to identify the characteristics of those people, e.g., holding higher environmental preferences, help to ensure the success of those investments. The findings obtained in Torgler's et al. (2008) analysis can also be used to bring about positive environmental outcomes in other areas as the interesting and attractive feature of this behaviour is its voluntary nature. Such behaviour is not only cost effective, but can be more successfully activated in areas where law enforcement and market incentives fail (because they are too hard or expensive to implement). There are implications for both developed and developing countries: for instance, developing countries experience a major problem with littering on public places and the clean up is quite expensive for the city councils. Heavy fines and strict law enforcement have been trialled in unsuccessful attempts to discourage littering (Torgler et al. 2008, p. 26-27). Hence, this should be useful for politicians and decision-makers as well, ideally by incorporating a strategy for belief elicitation and management.

8.1.2 Prerequisites for and Responsibilities of Decision-Makers and Top-Officials

8.1.2.1 Belief Management

Since beliefs about others' behaviour are highly relevant for voluntary cooperation if many people are conditional cooperators, policy should not only take into account the incentive effects on the behaviour of an individual, but also how policy affects the beliefs and behaviour of the majority of citizens who are conditional cooperators (Gächter 2006, p. 25). Establishing and maintaining cooperation thus involves the management of peoples' beliefs. Belief-dependent cooperation can be viewed as a social interaction effect that is relevant in many important domains. For example, if people believe that cheating on taxes, corruption, or abuse of the welfare state are wide-spread, they are themselves more likely to cheat on taxes and are more willing to abuse welfare state institutions.

It is therefore important that public policy prevents

ly to cheat on taxes and are more willing to abuse welfare state institutions.

It is therefore important that public policy prevents the initial unravelling of civic duties, because once people start to believe that most others engage in unlawful behaviour, the belief-dependency of individuals' cooperation behaviour may render it very difficult to re-establish lawful behaviour (Fehr and Fischbacher 2002, p. 15-16). Several studies discuss this fact in the field of public disorder (referred to as "broken-window-effect") and with petty crime, which we will briefly review in section 8.1.2.3.

8.1.2.2 Higher ethical Standards for Leaders as (moral) Role Models

Behaviour by leaders – politicians and top-officials – may matter strongly for the morale of the citizens. As leaders are "belief managers", amongst other things, leading by example strongly shapes beliefs about what others are doing, as experiments by Fischbacher and Gächter (2006) have shown.

There is a "multiplier effect", because a bad example (dishonesty in tax matters, corruption, and unethical behaviour in other domains) may not only have direct effects on the concerned individual, but may also have indirect belief effects about how others will react. Moreover, there may be strong path-dependency-effects, which may adversely affect morale in the long-run. Gächter (2006) argues that leaders should thus be role models for whom higher moral standards should hold than for normal citizens. Leaders in particular should be forced to resign quickly if there is confirmed evidence of dishonesty and inappropriate behaviour (p. 22-23).

8.1.2.3 The Role of Belief Management for Criminality, Public Disorder and Social Interaction

There is widespread acceptance in economics that criminal activities adhere to Gary S. Beckers dictum stating that as long as the material costs associated with criminal activities surmount the utility derived, a rational individual will exhibit rule-consistent behaviour (Becker 1968, Falk 2001). While the behavioural hypothesis for Homo Reciprocans predicts conditional behaviour in the willingness to conform to rules (i.e., to laws), an individual's willingness to act rule-consistent will be contingent upon the rule-adherence of other individuals. The point is

that the decision to engage in criminal activities not only relies on the calculus of material factors, but on the expectations on other individuals' behaviour (Falk 2001, p. 19). This consideration leads to the existence of good and bad equilibria for expectations. In the good equilibrium, where all individuals exhibit rule-conformity, others will be induced to do so as well, whereas in the bad equilibrium, where individuals expect rule violations, others' behaviour will lead to the erosion of the rules.

The existence of good and bad equilibria for expectations results in an interesting policy-instrument for the management of beliefs. Skogan (1990) discusses political belief management in the case of public disorder. The neglect of public buildings and places can elicit a self-fulfilling prophecy that a desolate appearance (e.g., littering) can enhance further ruinously decay. While an intact appearance of public places underlines the successful enforcement of norms, a desolate appearance can lead to the self-fulfilling prophecy of further ruinous decay (so called broken-window-effect). Skogan's (1990) empirical investigation in 40 US-American cities resulted in a positive correlation of public disorder in respective districts and the crime rate (Falk 2001). Kahan (1997) also outlines the possible benefits of policies that suppress disorder in public areas, because visible forms of rule-infringement will encourage further criminal activities (Falk 2001).

The correlation of appearance of public places and the willingness to adhere to norms and rules has also been verified empirically by Cialdini et al. (1990) who tested whether individuals litter more in an environment that is already polluted. They could show a positive correlation and conclude that the appearance of the environment sends a strong signal on whether norms are successfully upheld or not (Chen et al. 2007).

The implication for political belief-management is to suggest general norm-adherence: the demonstration of an intact appearance of public places by regular maintenance and the penalty of petty crime can suggest incentives for reciprocal behaviour. Falk (2001) considers the "zero tolerance" policies employed in New York which comprise of consequent punishment of petty crime⁸⁴, accompanied with a subsequent policy of deterrence. This deterrence leads to the expectation that few legal abuses occur, the social order is upheld, and, in turn, reduce conditional abuses of wilful damage to property.

8.1.3 “Social Engineering” – the optimal Grouping of Individuals

The idea of grouping individuals with similar preferences to achieve socially desirable outcomes, which we could refer to as “social engineering”, should be taken into account as well. Gunnthorsdottir et al. (2007) conducted an experiment, grouping high contributors with other high contributors without letting the players know the grouping. This resulted in superior outcomes among grouped cooperatives. The grouping done by the experimenter could also be conferred to politicians or authorities.

However, Ones and Putterman (2003), conducting an experiment similar to Gunnthorsdottir et al.’s experiment, state: “Although we demonstrated that one can with a reasonable degree of replicability put together groups that will significantly exceed average levels of cooperation – something one might want to do, for instance, to create a more successful business partnership or team – this came, in our homogeneous grouping periods, at the cost of also creating some extremely uncooperative groups.” (p. 33).

Thus, conferring “social engineering” from the experimenter to the politician could result in putting together low contributors and punishers of low contributors, rather than wasting the efficiency-enhancing potential of the punishers by grouping them with already cooperative types.

Ones and Putterman (2003) as a best approach also suggest to constitute as many groups as possible out of a mix of strong positive reciprocators, strong negative reciprocators, and more neutral or payoff maximizing types, while isolating the few strongly “perverse” punishers in groups that must either be treated as a “lost course”, or policed by some external mechanism⁸⁵).

8.2 Implications for corporate or intra-governmental Decision-Making

In light of the facts and possibilities (collected in sections 7 and 8.1) for fostering (voluntary) cooperative behaviour, a couple of recommendations for corporate or intra-governmental decision-making, i.e., managerial decisions, can be derived.

Providing the right Incentives in the Management of Pay Systems (Wages and Labour Contracts)

Remember, for instance, the findings on fairness principles (reciprocity) in labour and employment relations (addressed in section 7.4). These findings bear implications for decision-makers in terms of the management of pay systems. The fact that even a wage increase could be considered as a loss, which could trigger a negative response, stresses the importance of justified expectations to be fulfilled and expectations being realistic. Following Bregm (2008), “a tendency to optimistic expectations or a self-serving bias in evaluations implies the importance of managers contributing actively to a realistic formation of expectations.” (p. 89). Therefore, it should be an essential task for the management to inform employees about criteria and the expected possibilities for wage increments. This argument especially holds for the public sector (due to the greater transparency of comparison possibilities, as wages are known) than in the private sector.

Wages and Labour Contracts

An evenly important aspect concerns the specification of labour contracts. In section 7.4, we learned that reciprocally motivated individuals respond to fair treatments, such as higher wages, with higher levels of motivation and work effort. Employment relations to a large extent are characterized to be regulated by incomplete contracts, i.e., not all details which might matter in an ongoing relationship are contractually determined (Falk et al. 1999). This opens up room for social norms to govern behaviour. For instance, by paying generous wages, firms may have incentives to appeal to workers’ reciprocity. For the former (incomplete contracts), in a much cited study on labour contracting, Fehr et al. (2001) found that subjects provided less effort when the contract specified fines for inadequate performance than when it did not. These findings are in line with a large literature in psychology that has documented many instances where explicit incentives for task performance lead to decreased motivation and reduced long-run performance (see, e.g., Deci 1975, section 2.2.6.2, and Benabou and Tirole 2004, p. 1).

Besides monetary incentives, there exist social incentives, like social approval or disapproval, employees may also react to when they decide about their behaviour in the contractually incompletely specified employment relation (Falk et al. 1999).

Crucial here is the role that positive and negative reciprocity play in human's willingness to cooperate; they are critical in the design of incentives (Cardenas 2004, p. 238). With an incomplete contract, for instance, a reciprocal worker is able to punish the employer by choosing a low effort level.

Therefore, wage variations that are unrelated to variations in performance incentives may nonetheless have a large impact on behaviour. Bewley (1997) provides extensive field evidence which supports this view (see also Falk et al. 1999 and Bregm 2008).

Good Governance and the effects on work morale

Business Practitioners agree that work morale, i.e., loyalty, initiative, creativity, helping others, and zest for the job is crucial for productivity (Bewley 2000). Work in experimental and behavioural economics indicates that work morale is strongly shaped by the behaviour of the management and co-workers.

First, there may be social interaction effects in that people adapt their work morale to that of their peers (Gächter 2006).

Second, the leadership model (e.g., leading by example or leading by threats) suggests that managers may strongly influence morale and voluntary cooperation. Some evidence clearly expresses the conviction that leading by example matters for the ethical behaviour of employees (e.g., Fehr and Falk 1999). Moreover, belief management (section 8.1.2.1) suggests that the CEO's behaviour may have long-lasting consequences on company morale and culture because of path-dependency effects.

Third, that group composition (i.e., selecting the "right member", remember subsection 8.1.3) matters may explain why companies sometimes fire workers, despite firing looks like a policy of management by threats. Yet, as Bewley (2000) notes, human resource managers use the possibility of firing workers and incompetents to re-establish the work morale within the other employees. Firing is therefore used mainly as a means to remove "bad characters" from the group and not as a threat to discipline the other workers. The reason is that explicit threats create a hostile atmosphere and may even reduce the workers' generalized willingness to cooperate with the firm. According to Fehr and Fischbacher (2006), managers report that the employees themselves do not want to work together with lazy colleagues, because these colleagues do not bear their share of the burden, which is viewed as unfair. Therefore,

"the firing of lazy workers is mainly used to establish internal equity, and to prevent the unravelling of cooperation" (Fehr and Fischbacher 2006, p. 15-16). If conditional cooperators know that they are among "like-minded" cooperators, cooperation can be established at very high levels. In a company context, this may mean that even a few shirkers can undermine work morale. Motivated workers may prefer that "bad apples" are fired because they do not like being "suckered" by their colleagues, and because it re-establishes beliefs about others' team spirit (Gächter 2006, p. 21-22).

The formation of a corporate culture of teamwork and helpfulness

Managers' behaviour also plays a decisive role in the formation of a corporate culture. The following two paragraphs examine the question whether it is beneficial to a firm if the creation of an atmosphere of teamwork and helpfulness is promoted. Thereto, major results of Kosfeld and von Siemens' (2007) recent study on competition, cooperation and corporate culture will be utilized.

Teamwork, cooperation, and helpfulness between workers, as several studies have confirmed, can be of substantial value to a firm. There are many examples – workers with complementary skills can increase output and productivity by helping each other on individual tasks. Similarly, communication and the sharing of relevant information between different workers or working groups often greatly enhance the efficiency of production. While cooperation between workers is beneficial to the firm, the exertion of cooperative effort is usually costly to a worker. Moreover, it is typically hard to identify, let alone to verify, whether or not a worker helped a co-worker or shared information. Hence, incentives for cooperation are difficult to provide. Unless workers are intrinsically motivated, firms therefore often face inefficiently low levels of worker cooperation.

In their model, Kosfeld and von Siemens (2007) assume that there exist two types of workers: selfish workers and conditionally cooperative workers. A selfish worker responds to monetary incentives and hence exerts individual effort only if monetary incentives are sufficiently high. Since teamwork is non-contactable, a selfish worker never exerts team effort. A conditionally cooperative worker, on the other hand, also responds to monetary incentives with respect to individual effort. However, he might also exert team effort in case his co-worker coopera-

tes as well. The authors derive the result that no teamwork is observed in firms offering what they call “selfish contracts”, which are solely based on monetary incentives.

Kosfeld and von Siemens’ (2007) model also provides an explanation for the emergence and stability of different corporate cultures (by which they mean differences in the level of cooperation and team work within firms). Firms in their model compete under incomplete information about the type of worker accepting a particular contract.

Contrary to research in management science, that stresses the importance of leadership with regard to corporate culture (see, e.g., Schein 2004), firms in their model develop different cultures not because particular entrepreneurs create them, but because they are the outcome of competition for workers with heterogeneous preferences (p. 21). The authors find evidence that firms which enjoy high levels of team work tend to be more productive than firms without or with only low levels of team work (p. 4, citing several studies).

By choosing different contracts, “workers in equilibrium self-select into different firms, thus leading to heterogeneous corporate cultures of teamwork with corresponding differences in incentives and firm productivity.” (p. 5).

An interesting conclusion comes from Bohnet and Baytelman (2007). They argue for environments characterized by external contract enforcement devices and state that these “do not attract the intrinsically motivated “good-doers” as they do not reward intrinsic social orientation. Politics will not attract particularly virtuous politicians if it treats the socially oriented identically to the selfish.” (p. 114).

9 Implications for Public Policy

Whereas the phenomena described in section 8 are appearing universally in all policy fields, and therefore not designating one certain policy field, we now turn to specific aspects of two public policy fields in section 9: fiscal policy and social and welfare policy. Institutional policy (as a third policy field) again is made a subject of an auxiliary instrument to integrate and enforce policy outcomes. Finally, typically democratic governance principles like federalism (decentralization) are examined in whether their existence (and implementation) is able to bring about

profits in terms of (increasing) socially desirable outcomes. Bowles (in Gintis 2005), for example, refers to community governance as a means that can be employed to solve problems that cannot be mastered by individuals, markets or states. To illustrate this point, the author reviews examples such as the efficacy of peer-monitoring in neighbourhoods (with high criminality). To explain the advantages of community governance, he points to repeated interactions, information flow, and the effectiveness of informal punishment. Yet, Bowles closes by noting that economic inequality might impede the capacity of communities to solve problems (DeScioli 2006, p. 3-4), taking this as a plea for the redistributive welfare state (section 9.3.2).

Community governance, however, is just one peculiarity of possible governance principles, which we’ll now devote to.

9.1 Policy Instruments and Governance Principles

In this section we will discuss the role and use of different policy instruments that are at policy-makers’ disposal. These instruments include institutions and law enforcement possibilities. As law enforcement is costly, questions on how to lower these costs arise. In this respect, considerations on how to incorporate less informal (i.e., less expensive) controls to supplement legal punishment, could be promising.

Furthermore, policy instruments often are related to certain governance principles, such as federalism (section 9.1.2). Studying the effects of federalism and regulation in situations with partial enforcement capacities, e.g., in the context of governance of (local) eco-systems, particularly in self-governing mechanisms versus externally imposed regulations, several lessons about governing can be learned (section 9.1.2.2).

9.1.1 Institutions

If we reconsider the role of institutions as discussed in section 7.3, a goal of institutional intervention should be to change a prisoner’s dilemma situation so that the socially desirable result is achieved. A precondition surely is that people can rely on the sovereign forces of the state. There are several options for interventions then (following Engel 2007): a tax may reduce the benefits from unilateral

and defective reactions. Likewise, a subsidy may increase the benefit from unilateral contribution. Furthermore, those who have contributed may be given the enforceable right to exclude those from the benefit who have not contributed, or may be allowed to conclude binding and enforceable contracts (Engel 2007, p. 4).

Problems and Pitfalls in institutional design

There are, however, many reasons why the design of effective institutions is difficult and why institutional designers ought to be cautious. Many institutions are informal, and informal institutions frequently emerge, rather than being purposefully designed (Hodgson 1988). In addition, the target of institutional intervention, human behaviour, is usually socially embedded (Granovetter 1985). Changing behaviour sustainably with informal institutions therefore needs time. According to Engel (2007), institutional intervention must be designed to set in motion a learning process in its addressees if it shall prove effective.

The optimal design of institutions is a strand of literature on its own and not covered here. However, theoretical work by Buchanan and Tullock (1962) and the essence of the work in “New Institutionalism” state that those deciding on the introduction of new institutions do not always have other-regarding preferences in their rationale.

According to Knight (1992), this does not necessarily imply that existing formal institutions always miss their stated purpose of social betterment; but the pessimistic remark is that they are likely to pick those solutions that give well-organized political forces a distributional advantage. Once the legislator has enacted a new law or rule, it is handed over to the legal system. Like any subsystem of society, “the legal system applies its own internal logic, which may well be at variance with the original political intention”. Conversely, institutional addressees have the ability to creatively mute the institution (Wegner 1997, Engel 2007, p. 7-8).

9.1.1.1 International Institutions (the Quest for optimal Design Principles)

Transnational public goods and externalities are a good example for a need of institutional arrangements, as independent actions often result in non-

optimal Nash-equilibria. To foster cooperation, the international community has devised institutions⁸⁶ in some areas. Examples include aviation, international shipping or telecommunications: institutions in these areas have evolved in the form of conventions and allocative mechanisms, reflecting the common interest in establishing standards of behaviour concerning accident avoidance, jurisdictional rights or competitive practices (Acre and Sandler 2001).

For other fields like environmental and security concerns, treaties and alliances have been used with varying degrees of success. Recent environmental treaties (e.g., the Helsinki Protocol on emissions or the Montreal Protocol on ozone-shield depletion) tend to codify Nash-behaviour and, as such, do not represent much in the way of cooperative gains⁸⁷. Treaties, alliances, and other supranational institutions that are intended to provide public goods or correct externalities, thus result in Nash-equilibria that are sub-optimal. An enormous literature on how more effective institutions that are able to improve upon these equilibria has emerged. Acre and Sandler (2001), for instance, propose such an institutional design. The basic assumption is to limit transaction costs and the requirement of little loss of autonomy on behalf of the participants, thus improving their “well-being”. They state: “A supranational institution, e.g., an alliance or treaty, that employs a correlated strategy sends costless signals, not unlike that of pre-play communication, which allows the participants to condition their play so as to avoid bad outcomes and improve their expected payoffs over Nash equilibria”⁸⁸ (p. 495).

9.1.1.2 Punishment (optimal Design Principles), Laws and Costs of Enforcement

Conditional cooperators reduce their cooperation in the absence of punishment of free riders. The experiments described throughout this work suggest that the goal of policies should be twofold: on the one hand to punish the free riders (i.e., tax evaders, corrupted decision-makers) and at the same time to maintain the optimistic beliefs of the cooperators, by reassuring them that they will not be “suckered” by free riders, so that they continue to uphold their morale together with other “like-minded cooperators” (Gächter 2006).

Yet, apart from the legal implementation (which might be relatively simple), this is no easy task,

given the behavioural (ir)regularities discussed in chapter 6. The reason is that punishment may entail monitoring and a general distrust of the citizens. This in turn is problematic for two reasons:

- First, there is evidence that monitoring may crowd out intrinsic motivation and reciprocal behaviour (see, e.g., Frey 1997 or Fehr and Gächter 2002).
- Second, monitoring may express distrust, which, in addition to the crowding out effect, may have detrimental effects on, e.g., the beliefs about the tax morale of other tax payers.

Thus, Gächter (2006) argues that in order to avoid the negative side effects of distrusting most citizens, policies should aim at punishing the big offenders severely and treat the mild offenders mildly (by not using the full force of penal law, for instance).

This has two advantages: First, strong sanctions have a deterrence effect, and they also reassure and signal the honest citizens that large-scale anti-social behaviour will be punished, which reduces the “sucker effect”. Second, by trusting citizens and by fostering the fairness of, e.g., the tax system and the tax authorities, crowding out effects of intrinsic motivation and voluntary cooperation may be avoided (Gächter 2006, p. 22-24).

The Costs of Law Enforcement (and new Forms of Informal Sanctions)

If groups are able to informally enforce rules, the costs of law enforcement might be reduced by taking advantage of informal sanctions and the enforcement mechanisms underlying social norms. In recent years, for example, legal scholars and practitioners have turned to shaming as a form of punishment (Kahan 1996).

Instead of (or in addition to) putting someone in jail, a judge may order the placement of a sign on their house identifying them as “dangerous”, publish their name in the town newspaper, or some other publicizing of their offense. The idea is that law can incorporate less expensive informal controls to supplement legal punishment.

However, there also exists research that points to a problem with this approach: the same sanction with the same costs and benefits may be imposed differently depending on the social context (section

2.2.5). Publicity regarding offenses may incite negative reactions from the community members. Horne (2007) argues that offenders, therefore, might be the subject to informal sanctioning greatly exceeding what the offense merits. Thus, relying on norms to address dissatisfaction with law should be done with cautiousness, as norm enforcement may reflect characteristics of social relations more than the particularities of an offense (Horne 2007, p. 166).

9.1.2 Federalism (Centralization versus Decentralization) and Regulation

In the debate of subsidiarity and civil societal actions, Falk (2001) argues that the reinforcement, appreciation and valorisation of small political units like townships, municipalities, quarters and districts, clubs and associations is favourable for several reasons: The smaller a group, the easier it is to target norm-violators, which in turn enables groups to establish sanctioning mechanisms that reach free-riders with high accuracy. Second, members of smaller (political) units often interact repeatedly. As we know, repeated interaction has positive effects on contribution behaviour (Keser and van Winden 2000, Falk 2001) and long-lasting relationships lead to more reciprocity and a higher efficiency level as compared to one-time-interactions (Gächter and Falk 1999). In all, this confers attractiveness on small political units for the adoption of various political tasks (Falk 2001), e.g., in fighting for illegal use and demand of aid money or more effective provision of local public goods.

When there are risks for collective action to fail because monitoring among group members is imperfect, the introduction of centralized mechanisms to control free-riding might be desirable to combine the best of both centralized and decentralized worlds.

9.1.2.1 Consequences of direct-democratic Participation and Decentralization

One strand of research not yet discussed is the research on happiness and subjective well-being, which will now be used as a vehicle for participational consequences for political outcomes.

Frey and Stutzer (2000) argue that there are two major reasons why a higher extent of direct political participation possibilities or more strongly develo-

ped institutions of direct democracy (in particular via popular referenda and initiatives) can be expected to raise citizens' subjective well-being (Frey 1994). Firstly, due to the more live and active role of the citizens, (professional) politicians are better monitored and controlled. Government activities, i.e., public outlays as well as many other decisions by the government are closer to the wishes of the citizenry (e.g., Pommerehne 1978, 1990). Therefore, the authors argue, satisfaction with government output is reflected in a higher level of overall well-being.

Secondly, the institutions of direct democracy extend the citizens' possibilities to get involved in the political process. This notion is supported by Fehr and Rockenbach (2003) who find that participation of individuals in self-governed mechanisms that are seen as democratic and perceived as fair can contribute to maintain altruistic behaviour. However, Elinor Ostrom in one of her latest papers also alludes that "unfortunately, some policy advisors have thought that involving the users of a resource in some kind of participatory activity is an easy way to overcome resistance to external programs designed to protect resources. This is not the lesson we have learned. Calling resource users to a single meeting and asking them "to participate" while telling them what a project will do, is just an exogenous change that is likely to crowd out positive endogenous processes (Frey 1994). These efforts are unlikely to create a setting in which reciprocity and trust can be achieved" (Ostrom 2006, p. 161).

Finally, federal decentralization, and, in particular, local autonomy, is another constitutional element, which can be hypothesised to positively affect citizens' happiness. Political decision making in municipalities is closer to relevant information about residents' preferences and also closer to direct control by its citizens, as Frey and Stutzer (2000) argue.

9.1.2.2 Self-Governance (within small local Groups)

Ostrom (2006), studying 200 local irrigation systems in Nepal, argues that (local) self-governance regimes tend to enforce norms more reliable locally than centralized government enforcement in producing compliance. The success of local enforcement is due to the huge variety of rules, which often include many redundancies that seem to facilitate experimentation and fine-tuning of local enforcement systems.

An evenly interesting aspect for policy-design includes the evaluation of social costs of introducing external regulations that require monitoring, enforcing institutions and resources, against the resources that groups can endogenously provide to enforce their self-governing institutions. In the case of external regulations, once implemented, there are net transfers of resources flowing from the regulated group to the regulator (when fines are collected). If fines are collected, there are net losses for the group, while in the case of self-governed mechanisms, not only less financial resources are required, but the social costs assumed by the community can be assumed as contributing to other types of gains for the participants and the building and reinforcing of governance mechanisms that reduce social losses from opportunistic behaviour (Cardenas 2004, p. 239-240).

9.1.2.3 Detrimental Effects on Self-governance by spiteful Punishment

Whereas pro-social motivations coupled with costly informal sanctions of free riders make "self-governance" in the sense of high levels of voluntary cooperation possible, there also exists empirical evidence that informal punishment can have detrimental consequences that severely limit successful self-governance⁸⁹). In an experiment using different subject pools in Russia, Gächter and Herrmann (2006) observed substantial punishment not only of free riders, but also of people who contributed the same or more than the punishing subject (hence we refer to this sort of punishment as being "spiteful").

Spiteful punishment has been observed in various studies (remember section 7.5), and can be of considerable magnitude. In Gächter and Herrmann's study, for instance, the ratio of expenditures on spiteful punishment of free riders was 78 percent among urban mature people (and 39 percent for the urban young people) in their Russian sample. By contrast, Fehr and Gächter (2002) identified a ratio of 23 percent in their experiments with undergraduate Swiss students. The presence of spiteful punishment, however, influenced voluntary contributions in any case: Among the urban mature participants, cooperation in the presence of a punishment option was even lower than in its absence (Gächter and Herrmann 2006).

Punishment possibilities, however, are not always available. Consider, for example, tax policy. Punish-

ment in this context comes in the form of non-contributing, i.e., not paying taxes, which we will now turn to. Further interesting questions in this matter are whether tax morale and fairness considerations constitute true motivations for tax compliance or whether they are mere rationalizations of selfish behaviour. We'll henceforth review several aspects influencing tax ethics.

9.2 Fiscal Policy

The dominant view and assumption in the models of optimal taxation (relying on Homo Oeconomicus) is that only those who expect to draw a net benefit from it adhere to public redistribution. Thus, the individual demand for redistribution depends negatively on the contributions that people actually pay and positively on benefits, they expect to be returned from the public redistribution (Sinn 1995). Taxpayers are thus likely to evade taxes unless the probability of detection and the severity of expected penalties renders tax evasion an unattractive option (Wenzel 2005). However, relying on Homo Reciprocans, tax morale shall be understood as a form of conditional cooperation, where different outcomes can be expected, if there is no violation of fairness principles.

9.2.1 *Perceived Fairness of the Tax system, Tax Morale and Benefit Fraud*

Gächter (2006) alludes that political decision makers and legislators should be aware that norms of reciprocity can influence tax morale decisively. Ample evidence both from the field and the lab exists that proves that people pay more taxes (or conversely: do not falsely claim welfare benefits) than the standard economic model of tax evasion predicts (see, e.g., Andreoni et al. 1998 or Torgler 2002). People are less likely to cheat on their taxes or to commit benefit fraud if others behave honestly (e.g., Cialdini 1989, Andreoni et al. 1998, Slemrod 1992, Gächter 2006, p. 20-21)⁹⁰.

The perception of the fairness of the tax system matters

Investigations on the determinants of tax compliance have revealed the particular importance of the perception that the tax system is considered as fair

(Seidl and Traub 2001). Likewise, the treatment by authorities apparently is an important determinant for peoples' tax morale (Pommerehne and Weck-Hannemann 1996, Frey 1997, Feld and Frey 2002). Cum-mings et al. (2005), for instance, present results from laboratory experiments, which they conducted in Botswana and South Africa. The experiments demonstrate that differences in the fairness of tax administration, perceived fiscal exchange and attitudes towards the government can explain observed differences in tax compliance. Cummings et al. also prove these experimental results to be robust as they replicated them for the same countries using survey responses that measure tax compliance.

How can models of conditional cooperation explain such findings? Gächter suspects that there may be a direct effect by the concerned individual who may reciprocate unfair treatment by authorities and/or the tax system by a lower tax morale, simply because the taxpayer resents unfair treatment in the first place. Second, there may be an indirect effect via the beliefs on other taxpayers' behaviour that tax authorities signal (see also section 8.1.2.1). The reason is that if many people share similar feelings and experiences, then this will lower the belief that others have a high tax morale, which further undermines tax morale. Similarly, the governments trust in the honesty of its citizens may lead to a direct effect of "trust breeds trust" (Feld and Frey 2002), presumably because people like to be considered trustworthy. If such feelings are widespread, they may shape beliefs about other citizen's tax morale and hence reinforce the taxpayer's morale (Gächter 2006, p. 20-21).

A further interesting observation by Torgler (2005) is that tax evasion at the Swiss cantonal level is higher in cantons where citizens have more direct democratic rights. Direct-democratic procedures may positively influence tax morale according to models of conditional cooperation. Gächter (2006) sees the reason in that direct democracy may affect the beliefs about other peoples' tax morale once a tax law is passed in a referendum. A referendum signals peoples' opinion about a topic and "the dissemination of opinions via the result of a referendum may shape peoples' beliefs about others' behaviour" (p. 20-21). Tyran and Feld (2002) tested this intuition in an experiment and found support for it.

9.2.2 Unintentional Adverse Effects of Taxation through motivational crowding out or Signalling Effects

Throughout this work it became clear that deviations from selfishness operate in a diverse array of economic settings. Ostrom (in Gintis et al. 2005) argues that increasing the costs of tax evasion can crowd out intrinsic motivation to contribute taxes, removing fees associated with irrigation networks can decrease system maintenance, offering to compensate citizens for accepting a nuclear waste facility in their neighbourhood can decrease willingness to do so (Descioli 2007, p. 4).

In a related vein, Ariely et al. (2007, p. 4-5) develop the following scenario: an individual is considering to buy a new hybrid car. This car is more expensive than an equivalent car operating with a standard gasoline engine, but the hybrid car helps in preserving the environment. Therefore, driving around in a car, which is clearly a hybrid car, would probably add to one's positive image, especially if one lives in a community that values environmental-friendly technologies. The authors now suppose that the government gives a large tax benefit to those who decide to purchase a hybrid car (and everybody knows about this). The tax incentive, of course, reduces the price of hybrid cars and therefore should make a hybrid car more attractive for the individual. However, the tax incentive also decreases the image value of driving the hybrid car. Without the tax incentive, buying the car definitely shows the individual cares for the environment (positive image), while with the tax incentive, it does not.

The general insight is that, when extrinsic incentives are provided (such as a tax benefit), it is difficult to conclude whether the pro-social act is due to one's good traits (the person's concern for environment) or due to greed (receiving a tax benefit). Thus, if image indeed motivates pro-social behaviour, introducing extrinsic rewards may reduce image motivation, which can lead to a negative net effect (relative price effect net of crowding out effect) on pro-social behaviour (Ariely et al. 2007, p. 4-5).

This directly leads us to some policy advice.

9.2.3 Implications for Governmental Tax Benefit Policies

Following Ariely et al. (2007), normative policy advice could therefore recommend that if a government considers a tax benefit policy to foster the adoption of a new environmental-friendly technology, it should expect the policy to be more successful for a non-visible technology, such as environmental friendly water boilers, relative to a visible technology, such as hybrid cars. This is because hybrid cars, which are clearly visible, may partly be purchased as a signalling medium, while water boilers are most likely not.

By giving tax benefits, the government might unintentionally damage the signalling value underlying the purchase of a hybrid car. Numerically, the net effect of the incentive depends on the strength of the price effect compared with the crowding-out effect (see also Gneezy 2003).

If decision-makers, such as policy makers, anticipate the effectiveness and crowding-out hypothesis, they should use fewer public extrinsic incentives for visible pro-social activities. This brings us back to Titmuss and his intuition that monetary incentives might reduce pro-social behaviour, claiming it crucially depends on the visibility of the pro-social decision. Therefore, if blood donations are public, there is reason to doubt the effect of extrinsic incentives and even to expect decreasing blood donations when monetary incentives are provided (Ariely et al. 2007, p. 17-18).

We now shortly stress a generalization of tax reduction policy, namely general design issues of governmental subsidies that take fairness principles into account.

9.2.4 Implications for Governmental Subsidy Policy-Design

Fairness models predict that governmental contributions to a public good will have no effect on private contributions. A governmental subsidy, however, will decrease the cost of contributing to the public good. This implies, following Nyborg and Rege (2003a), that if the society is already in a state in which people with high fairness concerns contribute to the public good, then a subsidy can increase the number of private contributions to a public good (p. 408).

Coming back to the crowding-(in/out) observations from section 9.2.2: A subsidy on contributions may well be interpreted as a signal that the government acknowledges and wishes to support individuals' environmental conscience (in buying hybrid cars). However, it may also be interpreted as that the government distrusts individuals' environmental morality (inclinations to polluting the environment) and believes that economic incentives are the only language they understand.

This means, the former interpretation would crowd-in intrinsically motivated contributions, while the latter interpretation would lead to a crowding-out. Which interpretation individuals choose will "presumably depend as much on the way a policy is presented as on which instrument the government decides to use." (Nyborg and Rege 2003a, p. 412).

9.3 Social and Welfare State Policy Implications

Finding support for welfare societal actions within the citizenry can ensure enduring (i.e., successful) distributive (welfare) policies. However, this is bound to certain principles. Gintis et al. (2005) review how reciprocity-outcomes shape attitudes towards welfare, and derive implications for the public support of welfare programs. According to their results, two groups of theoretical perceptions have to be taken into account:

1. perceptions of neediness of the recipients (section 9.3.2),
2. and models of social rivalry.

Models, which posit the social rivalry effect, state that individuals compare themselves both to the individual belonging to the social classes that are better off than their own reference group, and to the ones that are worst-off of their reference group. This means, their well-being decreases when the redistribution makes their reference group closer to the worst-off group, *ceteris paribus*. According to Boarini and le Clainche (2007), this may explain why individuals could oppose redistribution.

9.3.1 Preconditions for the Acceptance of political Interventions

The operativeness of the welfare state and supportive society is bound to principles of non-abuse of its services and peoples' notion that social political arrangements are perceived as fair (Falk 2001).

Nowadays, the acceptance of the welfare state is not guaranteed at all. In the U.S., e.g., several social programs meet refusal within the population (examples to follow, for a detailed account see Bowles and Gintis 1998). In Europe, there is a vivid discussion on the affordability and adequacy of welfare state actions. An argument is, that, in the long run, the existence of the welfare state can only be secured when there is a broad reassurance within the population for fair redistribution (Falk 2001, p. 16). The crucial question hereby is the perception and meaning of "fairness" (remember the discussion in section 9.2.4, Falk 2001, p. 15). There are several examples for political attempts that met refusal within the citizenry because of violations of fairness principles. When the Thatcher Administration planned to introduce a poll tax (taxation per capita) in the U.K., for instance, sharp protests hindered the introduction as the very wealthy (e.g., the upper class) would have had to spend only a minor amount of their income relative to the tax burden the middle or lower class would have had to bear (Falk 1999, p. 14).

9.3.2 Solidarity and Support for the redistributive Welfare State and Social Policies

Following Bowles and Gintis (1998), pro-social preferences are also likely to shape the structure of social policies that aim at helping the poor, because political support for policies favouring the poor depends to a large extent on whether the poor are perceived as "deserving or as undeserving" (Wax 2000). If people believe that the poor are poor because they do not want to work hard, the support for policies that help the poor is weakened, as the poor are perceived as undeserving. If, in contrast, people believe that the poor try hard to escape poverty, but for reasons beyond their control, they could not make it, the poor are perceived as deserving.

This sentiment indicates that the extent to which people perceive the poor as deserving is shaped by reciprocity. If the poor exhibit good intentions, i.e., they try to contribute to societies' output, or if they

are poor for reasons that have nothing to do with their intentions, they are perceived as deserving.

For policy interventions, this signifies that social policies enabling the poor to demonstrate their willingness to reciprocate the generosity of society will mobilize greater political support than social policies that do not allow the poor to exhibit their good intentions (Fehr and Fischbacher 2002). Wax (2000) convincingly argues that an important reason for the popularity of President Clinton's 1996 welfare reform initiative was that the initiative appealed to the reciprocity of the people. The slogan of Clinton's reform initiative – "Personal Responsibility and Work Opportunity Reconciliation Act" – is telling in this regard (Fehr and Fischbacher 2002, p. 16-17).

10 Final Conclusions and Perspectives

10.1 Are People cooperative in the End?

All said, are people cooperative in the end? Well, yes and no. We know that around 50 % cooperate initially in a one-shot dilemma under anonymity. This is the good news. And the other half? Latest evidence suggests that some 20 - 30% are notorious free riders (Nash-players). Pioneering efforts in the experimental analysis of public goods explained the rest by subjects' making mistakes, not caring, being confused, bored or choosing their allocations randomly (Ledyard 1995). Since then, several theories giving support that more purposeful patterns underlying cooperational behaviour have emerged. There is consent that altruism, self-interest, reciprocity, decision costs or social norms (amongst other possibilities) are all competing with each other in subjects' true preferences. A task facing experimentalists is to separate the effect of these forces from each other. In Ledyard's words: "The optimistic remark is that since 90% of the subjects seem to be responsive to private incentives, it will be possible to create new mechanisms which focus that self-interest towards the group interest prevails. We need not rely on voluntary contributions approaches but can instead use new organizations."⁹¹ (p. 70).

In this work, we were interested in the understanding under which conditions people contribute to public goods, paraphrasing Adam Smith, to "thoroughly enter into all the passions and motives which

influence it". Peoples' actions reflect a variable mix of altruistic motivation, material self-interest and social or self-image concerns. This mix varies across individuals and situations. Crucially, altering any of the three components of motivation (for instance, by the use of extrinsic incentives or a greater visibility of actions) changes the meaning attached to pro-social (or anti-social) behaviour. This, in turn, feeds back to the reputational incentive to engage in it (Benabou and Tirole 2004, Kurzban and DeScioli 2007, in press).

Recent empirical work by psychologists Kurzban and DeScioli (2005 and 2007) suggests that individual differences in contributions are not idiosyncratic, but rather reflect strategic types with appropriate features clustering around each. It has been found that cooperators, reciprocators or strategists comprise roughly 60 % of all players, who, given the right enforcement tools or settings (rewards, sanctions, publicity, and disclosure) can restrain selfishness; and they will. People value fairness, fear punishment, and direct punishment is an effective means of increasing, or at least maintaining, high levels of cooperation among interacting individuals. Fehr and Fischbacher (2000), for instance, demonstrated that allowing punishment could lead to even full cooperation. However, whether these results reflect universal aspects of fairness, or an evolved psychology, modulating decisions about giving, is the subject of much recent debate (e.g., Camerer and Thaler 1995, Hoffman et al. 1994, Fehr and Schmidt 1999, Gurven 2004, Camerer and Fehr 2006).

Broadly speaking, understanding the differences in behaviour in social dilemma situations will be improved by linking behaviour with underlying differences in motives, which might vary as a function of either situational features (e.g., the incentive structure in a given interaction) or stable individual differences. Though we were able to collect some factors that seem fairly stable as "stylized facts" (in section 6), this is still not sufficient and there is ongoing work to develop this connection. A promising avenue of future research could be assessing the social value orientation of people in these types of games and looking at the relationship between this variable and behaviour, like Kurzban and DeScioli (2007, in press, p. 15) suggest.

However, in view of the new theoretical developments (i.e., experimental methods and different theories on preference assumptions), the importance of concerns for reciprocity in many economic domains, and in view of the existence of rigorous experimental techniques that allow to examine (until recently)

unsolvable problems in a scientific rigorous manner, Fehr and Fischbacher (2002) express their belief that it is time to recognise that a substantial fraction of the people is also motivated by reciprocity. They state: "People differ not only in their tastes for chocolate and bananas, but also along more fundamental dimensions: they differ with regard to their inclination to behave in a selfish or reciprocal manner, and this does have important economic consequences, both on the individual and the aggregate level" (p. 30).

10.2 The economic Consequences of being reciprocal on the individual and aggregate Level

Calling for an intensified investigation of the economic consequences (of reciprocity), Camerer and Fehr (2006) review new models of heterogeneous social preferences and bounded rationality that take heterogeneity of individuals and incentive interactions between different types of individuals into account. They convincingly argue that the mixture of those concepts can create profound effects on aggregate behaviour and enable better predictions of actual aggregate behaviour than traditional economic theory may do. Camerer and Fehr (2006) brilliantly reason:

"The examples discussed in this review show that heterogeneity in other-regarding preferences and bounded rationality, along with the structure of social interactions, determine when collective out-comes are close to predictions based on rationality and self-regarding preferences, or are far from those predictions. Under certain conditions, models based on self-regarding preferences and homogeneous rationality predict aggregate behaviour rather well, even though many people exhibit rationality limits and other-regarding preferences. However, under strategic complementarity, even a small proportion of other-regarding or boundedly rational players may suffice to generate collective outcomes that deviate sharply from models of Economic Man. The new models of heterogeneous social preferences and bounded rationality explain these puzzling results in a unifying way because they explicitly take heterogeneity and incentive interactions between different types of individuals into account. Therefore, they can explain when Economic Man dominates aggregate outcomes and when he fails to do so." (p. 52).

Painting in broader strokes, Camerer and Fehr (2006) conclude that "designing well-functioning economic institutions, to help poor countries grow richer, depends on a good model of human behaviour. Governments, philosophers and lawyers are concerned about crafting policies that protect consumers with rationality limits that are swamped by information and choices, while protecting the freedom of choice of expert consumers." (p. 52). We will continue the discussion on new models of human behaviour in section 10.3.

10.2.1 New Channels for Policy Interventions

Most policy recommendations are based on the Homo Oeconomicus model. This implies at least two things: achieving efficient allocation by insuring that property rights are assigned completely, and that market failures are corrected (Gowdy 2008). Research reviewed in this survey, however, takes the position that so-called "behavioural anomalies" are central to human decision-making, and, therefore should be the starting point for effective economic policies.

One of these behavioural anomalies are the economic consequences of reciprocity, e.g., for fiscal and general policy issues which we discussed in sections 8 and 9. One of the main results is that policies that reward people independent of their contribution to society will most likely be less supported by the public than policies that account for reciprocal considerations. As an example, take the workfare versus welfare debate. Unlike regular public assistance, workfare requires recipients to spend time on mandatory activities, such as community work. In the presence of reciprocally motivated taxpayers we would expect "that support in favour of workfare programs is more pronounced than often assumed." (Dohmen et al. 2006, p. 17-18).

Regarding the discussion about the acceptance of political interventions (section 9.3.1) or redistributive policies (section 9.3.2), an explanation for redistribution can also be found relying on reciprocity norms. In particular, individuals believing that laziness or a general lack of effort are the cause of economic precariousness demand less redistribution, while those who believe that unlucky exogenous circumstances determine poverty and exclusion, support redistribution.

In this respect, Boarini and le Clainche (2007) outline the existence of a joint effect between norms about determinants for getting ahead in life, and the expectations of reciprocating public aid. Individuals who believe in both self-determination and reciprocity are more in favour of redistribution than other individuals who, although they might be sharing the same view about personal responsibility, do not expect anything from redistribution. An interpretation for this finding is that “the existence of workfare measures might exert a positive effect on the stigmatisation felt towards recipients of public help” (Boarini and le Clainche 2007, p. 29). However, the authors also punctuate that “asking for counterparts could also indicate a willingness to sanction those who are deemed as not cooperative, namely those who are considered responsible for being worst-off.” (Boarini and le Clainche 2007, p. 28-29).

To conclude, the existence of reciprocity offers new channels for policy interventions, e.g., in the context of tax evasion. The typical policy recommendation based on purely selfish individuals is that tax evasion can be reduced by either increasing fines or detection probabilities. Reciprocity offers an additional perspective: if taxpayers are reciprocal, i.e., conditionally cooperative, they are more willing to pay taxes if the tax system is considered as fair and if other tax payers are expected to pay their taxes as well (Falk 2001). Based on the latter argument, Dohmen et al. (2006) see “the existence of two types of equilibria, a good one, where people pay taxes and expect others to pay taxes, and a bad one, where people don’t pay taxes in the expectation that others don’t pay their taxes as well. Tax policy could try to reach good equilibria with the help of expectation management and improving the perceived fairness of the tax system.” (Dohmen et al. 2006, p. 17-18).

An evenly interesting case for the use of “new” policy interventions are situations in which intrinsic motivations are low and few voluntary contributions are being made. In this case, extrinsic incentives can significantly increase contributions to a public good (Reeson and Tisdell 2008). However, where a few intrinsically motivated individuals already make voluntary contributions, there is considerable danger that the introduction of extrinsic incentives will crowd out these voluntary actions. Thus, policies intended to promote contributions to public goods may be ineffective or even result in a net decline of contributions. Reeson and Tisdell (2008) show that once intrinsic motivational aspects were removed from an activity (e.g., social approval effects), it may be difficult to re-establish cooperation as poorly

designed policies may even continue to cause problems in future periods even after they already have been removed (p. 280). In all, Reeson and Tisdell’s advice for policy makers lies in crafting policies that are able “to strengthen existing intrinsic motivations among those already contributing, while also providing attractive extrinsic incentives to encourage others to contribute” (p. 280).

10.2.2 *The social and economic Success of Homo Reciprocans from a different Perspective: Friends, Happiness and Well-being*

The question about what ultimately causes people’s happiness and how they can increase their well-being arises throughout the history of ideas. Meier (2004) argues that although the precise meaning of happiness is somehow fuzzy, many social scientists agree that happiness is an important goal in human life and “perhaps best summarizes success and achievement in a general way” (Frey and Stutzer 2002a, 2002b). It is therefore quite natural to ask whether reciprocal (pro-social) agents are happier or less happy than their non-reciprocal fellows are.

Remember the results, recent empirical investigations on this topic have revealed (section 5.2.6): positively reciprocal people reported to have more close friends and a higher overall level of life satisfaction.

So, who is happier – pro-selfs or pro-socials?

Meier (2004) argues that since life goals differ from individual to individual, it should be distinguished between “more extrinsically oriented” people, called materialists, and people who put more emphasis on intrinsic life goals. Materialists are characterized to believe that acquisition and possession are central means in achieving happiness (p. 150), whereas people with intrinsic life goals emphasize personal growth and development, and relationships as important sources of well-being. Research in psychology on the question, which set of goals would bring more life-satisfaction indicates that people with more materialistic goals are less happy than people who pursue intrinsic life goals (citing, e.g., Kasser and Ryan 2001, Ryan et al. 1996). Applied to pro-social behaviour, one then could assume that such a “hedonistic paradox” occurs because materialists do not help others and therefore do not benefit

from the internal rewards of pro-social behaviour (Konow and Earley 2002, Phelps 2001). As a result, Meier concludes that people who pursue their own happiness are not as happy as those who care for others (Meier 2004, p. 151).

In this sense, Homo Reciprocans – in the positive domain – might in fact be happier and thus more successful than his or her non-reciprocal fellows.

In a related vein, Layard (2005) claims that these findings also provide a challenge to the theory and conclusions of public economics, which is to incorporate the results of modern psychology while retaining “the rigour of the cost-benefit framework which is the strength and glory of our subject“ (p. 1). This train of thought directly guides us to our final topic: the way, intermediary steps, and necessities to a unified theory of the social sciences, which is able to map insights of all the disciplines of behavioural research.

10.3 Prospects and Perspectives: In search of a parsimony (behavioural) Theory for the Social Sciences

It is a major challenge for social scientists interested in the behavioural dynamics of humans to construct a behavioural theory of human behaviour that

- includes the classical economic model (when applied to the exchange of private goods under (in)complete information in market settings), but that
- assumes a wider range of motivations when individuals use resources that are non-private goods (Hirschmann 1985).

This means, providing a framework for how the variables involved in such a model are interlinked, is an important next step (Cardenas and Ostrom 2004).

Achievements up to now

During the last decade, there has already been much progress and fascinating new insights into the nature of human behaviour within the tenets of economics. Important allotments for these achievements are due to advances in formal methods and in Game Theory. First, an increasing number of experiments have compared predictions of competing theories.

Regardless of which models are most accurate, psychologically plausible, and technically useful, the important point for social scientists is that Game theory provides a menu of games, which can be used to measure social preferences in a rigorous way (see Figure 3).

Second, a huge number of experiments with a wide range of subjects and conducted in various societies have shown much regularity. However, Camerer and Fehr (2002) conclude that “exploring behaviour in these games in a much wider range of cultures, at various stages of economic development and with varying patterns of sharing norms, governance structures, and so forth, will undoubtedly prove interesting and important” (p. 27).

It is therefore necessary to remain open to the research methods and theoretical approaches of other social sciences, and beyond. Meier suggests that the theoretical predictions gained from such a cooperation of sciences must then have to be empirically tested in a stringent way, and is convinced that such research would provide a better understanding of the motivations for pro-social behaviour as well as knowledge about how institutions can be designed in order to foster cooperation (Meier 2004, p. 166-167).

10.3.1 Incorporating Reciprocity and Fairness Principles into Mainstream Economics

A first step on the way to a unified behavioural theory should be to routinely incorporate concerns for reciprocity into mainstream economic models. This means that – when analyzing an economic problem – one should routinely derive the implications of the assumption that, in addition to the purely self-interested types, roughly 50% of the people exhibit reciprocal preferences. It is obvious that, to achieve this, a precise mathematical model of reciprocal preferences is desirable. The work on reciprocity models in the past years has shown, however, that it is extremely difficult to build simple and tractable models of reciprocity. The problem is that the explicit modelling of intention-based or type-based reciprocity quickly renders these models mathematically very complex and difficult to handle.

Fehr and Fischbacher (2002) suggest that “the first best solution to the modelling problem would surely be a simple and tractable model of reciprocity. However, since this solution is not available, at least at present, there is also a need for simpler models that mimic the outcomes of reciprocity models in a

wide variety of circumstances but that do not explicitly model reciprocity.” (p. 28).

10.3.2 Linking (Evolutionary) Economics, Neuroscience and Evolutionary Biology: towards a Unified Theory of Human Behaviour

One of the great scientific achievements of the 20th century, as Gowdy (2008) in an astute paper depicts, was the unification of the natural sciences. The unification can be seen in the fact that although very different models are employed in the natural sciences, the basic understandings of such diverse fields as biology, physics and chemistry were made compatible (referring to Gintis 2007) by a common underlying model. An advantage in the natural sciences is, however, that although these fields possess and describe very different processes, the theory of natural selection, for instance, does not contradict the laws of thermodynamics. The situation in the social sciences is quite different. Theories of individual human behaviour held by economists, sociologists, decision scientists and anthropologists are contradictory and incompatible (Gowdy 2008, p. 636).

First Results from a new discipline: Neuroeconomics

Yet, in order to craft a parsimony theory of human behaviour, understanding the biological basis for differences in preferences and rationality bounds, and locating their neural circuitry, will also help the social sciences. Recent research in neuroeconomics tries to unearth the proximate mechanisms behind subjects' behaviour with neuroscientific techniques. Neuroeconomics examines processes in the brain of subjects when they make decisions. Using positron emission tomography images, one can re-enact which parts of subjects' brains are activated when they manifest some kind of behaviour (Peacock 2008, McCabe et al. 2001, Rilling et al. 2002, Adolphs 2003, Sanfey et al. 2003, DeQuervain et al. 2004). These studies show, for instance, that mutual cooperation and the punishment of defectors activate reward related neural circuits, “suggesting that evolution has endowed humans with proximate mechanisms that render altruistic behaviour psychologically rewarding” (Fehr and Rockenbach 2004). In particular, certain regions of the brain, i.e., the caudate nucleus (which is part of the dorsal striatum) is associated with reward, and a high activation of this region in experiments indicates that punishment

confers satisfaction to the punisher (Peacock 2008). Other recent results in neuroeconomics include confirming the well known loss-aversion effect: Tom et al. (2007) discovered that there are brain regions that evaluate potential gains and losses, and that these regions were more sensitive to losses. Their findings for its neural basis are “that in order for people to accept a 50-50 gamble the gain needs to be twice as high as the potential loss” (Gowdy 2008, p. 635).

Following Gowdy (2008), these neurological findings may not add new insights into behavioural patterns that are of interest for behavioural economics, but they do show that observed behaviours are not random mistakes but rather are part of human's “neurological inheritance”. Camerer and Fehr (2006) argue that neuroscience can inform economics about important kinds of higher-order cognition and conclude that “a better understanding of when the useful caricature of “Economic Man” dominates markets, or is dominated by social preferences and rationality limits, will inform all these enterprises and could lead to a more unified, and powerful, approach to both biological and social sciences of human behaviour.” (p. 52).

Evolutionary Biology and Economics

Hagen and Hammerstein (2006) emphasize that fruitful collaboration between economists and biologists, however, will “require frank discussion of their respective implicit cognitive models” (p. 347). The question is whether the human brain itself optimizes, in which case it is relatively easy to infer preferences from play (in simple games), or whether natural selection optimizes, in which case “inferring strategies from behaviour requires knowing how players have categorized their game partners and interpreted the game” (Hagen and Hammerstein 2006, p. 347).

In this review, bounded rationality was not a key topic. The extent to which rationality is bounded, however, is an important question that appears to undermine both the economists' and the evolutionary biologists' implicit cognitive models. Let us close this work with Hagen and Hammerstein's words: “The typical economists' model is a problematic idealization because it posits generalized computational abilities and preference consistencies that most people do not seem to possess (see, e.g., Rieskamp et al., in press). Typical models in evolutionary biology, on the other hand, are also unrealistic because they do not explain humans' obvious talent for dealing successfully with novel situations. A synthesis of the

two ideas is clearly needed. Human cognition is still a profound mystery that will require the combined efforts of all fields of biology and the social sciences to unravel. Reciprocity theorists have developed an impressive body of theory with which researchers in many disciplines must grapple. They have also astutely spotlighted one of the most pressing challenges to theoretical biology: integrating population biology with the cognitive and social sciences.” (p. 347).

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- 1) However, while many experiments demonstrate that behaviour differs from the predictions of traditional economic theory, they have not shown that economic reasoning is necessarily incorrect. Instead, as Carpenter (2007) states, “at this point in the evolution of experimental and behavioural economics, laboratory experiments have provided more new questions about economic behaviour than answers” (p. 522).
- 2) For example, competitive markets are an area where experiments have come close to confirming existing theories and theories of pro-social behaviour do not hold (Davis and Holt 1993, Carpenter 2007, p. 522).
- 3) Ledyard (1995) reduces this question to an even more basic level on the very nature of humans: “Are people naturally cooperative or selfish?” (p. 2).
- 4) They may be less helpful as a starting point, but for a glance at the bigger picture.
- 5) In laboratory experiments, by which economists study strategic decision making, participants (initially) are given a number or tokens (i.e., money for game play), denoted as the (initial) endowment.
- 6) In the economic literature, dilemma situations are also referred to as public good situations.
- 7) There exist several classifications of variables influencing behaviour within this work, each of them emphasizing different (situational or personal) contexts. Whereas, for instance, Figure 4 (in section 3) deals with factors relevant for the activation of different social norms, Section 6 (Table 1) adds empirical evidence on the relative strengths / importance of these elements.
- 8) Camerer and Fehr (2002) root this fuzziness in the fact that social scientists often rely on data like the General Social Survey, in which participants answer questions such as, “In general, how much do you trust people?” on a 7-point Likert scale.
- 9) If both decide to cooperate, they both earn a high outcome (e.g., 10); if both defect, they both receive a low outcome (e.g., 5); if one player cooperates and the other defects, the cooperator obtains a very low outcome (e.g., 1), whereas the defector receives a very high outcome (e.g., 15); (Fehr and Rockenbach 2003).
- 10) In the literature of experimental economics also, and more generally, referred to as studying voluntary contribution mechanisms (VCM).
- 11) The Nash equilibrium constitutes the set of each individuals’ contributions such that no individual has an incentive to change his or her behaviour when others’ contributions remain unchanged (Cardenas and Ostrom 2004).
- 12) A detailed account and overview on the applicability of different game types is offered by Brosig et al. (2007) or Camerer and Fehr (2002).
- 13) Structure and content heavily rely on Meier (2004).
- 14) Other contributions to the literature on signals, according to Benabou and Tirole (2004), include: “Bodner and Prelec (2003) and Bénabou and Tirole (2004) on self-signaling, Akerlof and Kranton (2000) on identity, Brekke et al. (2003) on moral motivation, Denrell (1998) on credibility and compensation, Veblen (1899), Leibenstein (1950) and Pesendorfer (1995) on ostentatious consumptions as signalling devices, and Bernheim (1994) on actions designed to signal conformity of tastes with others” (p. 4).
- 15) Researchers consider, for example, whether people share some of their possessions because they are motivated by altruism.
- 16) Thus, intrinsic motivation is not only limited to selfish-behaviour. We’ll address implications for pro-social behaviour in subsections 2.2.2 f.
- 17) For a more detailed account, see Meier (2004, p. 18). To mention just one experimental result: A one-dollar-increase of governmental grants reduces private contributions by at most 23 cents (Ribar and Wilhelm 2002), whereas in the laboratory, the crowding-out effect can be quite sizeable (Andreoni 1993).
- 18) Meier (2004) states: “If managers of charities or NGOs see fundraising as a burden (“necessary evil”), the flow of government grants may reduce their effort to raise donations.” (p. 18, see also Andreoni and Payne 2003, Segal and Weisbrod 1998).
- 19) According to Meier (2004): “In comparison to the private goods benefit (e.g., prestige, signalling wealth), the warm glow is purely internal, derived from the donor’s own knowledge of his pro-social behaviour. Psychologically, various underlying motivations may cause the ultimately egoistic warm glow, such as self-reward, negative state relief or guilt reduction.” (p. 19, for a survey see Bierhoff 2002).
- 20) In more technical terms: altruistic individuals are likely to contribute beyond the point where the pure-

ly selfish portion of their marginal benefit equals marginal costs.

21) A model that incorporates reciprocity and status into preferences is developed by Cox et al. (in press) and a nonparametric generalization of this reciprocal preferences approach is reported by Cox et al. (2006).

22) In solving (first order) public good situations, a possible solution is to create incentives for rational individuals to participate in the financing of the public good by means of additional institutions (e.g., sanctioning systems). The second order dilemma arising from the introduction of a sanctioning regime then is that no one is willing to bear the costs of implementing and financing the sanctioning institutions (also referred to as second order public good).

23) Benabou and Tirole (2004), for instance, citing a survey by Johansson-Stenman and Svesäter (2003) on questions what people find most important when buying a car, systematically ranked environmental performance near the top and social status near the bottom. When asked, “about the true preferences of their neighbours or average compatriots, however, they give dramatically reversed rankings.” (footnote 4).

24) Benabou and Tirole (2004) state: “A related set of classical findings in social psychology concerns attitudes towards victims. People who directly witness abuse or injustice often tend to derogate the victims, unless they are able to either help the victim or not feel any personal responsibility for his or her suffering (see e.g., Batson (1998, p. 296) or Lerner (1980)). By trying to convince both themselves (often with the help of some form of self-deception) and others that the victim would have derived only small benefits from such help, or did not really deserve it, they seek to avoid the adverse inferences about their character that not helping might otherwise generate.” (footnote 4, p. 2-3).

25) According to Meier (2004, p. 29, footnote 21), a number of studies in psychology analyze how in-group effects can influence the perception of the out-group. Open hostility towards people of the out-group may be the most negative effects of in-group favouritism. For a survey of such inter-group biases, see Hewstone et al. (2002).

26) Communication is therefore viewed as “cheap talk”.

27) Intrinsic motivation here is the value of giving per se, represented by private preferences for other-

s’ well-being, such as pure altruism (for a survey, see Fehr and Schmidt 2003).

28) A more detailed discussion can be found in Meier (2004, p. 33f.).

29) In neoclassical economics, preferences are usually assumed to be homogenous.

30) Benabou and Tirole (2004, p. 2) refer to the studies reported in Glazer and Konrad (1996, p. 1021) and note that anonymous contributions have the same tax-deduction benefits as non-anonymous ones.

31) Nyborg and Rege (2003b) note that the study of social norms traditionally has been regarded as a task for sociologists rather than economists. During the last two decades, however, an increasing number of economists have turned their attention to the integration of social norms into economics. This research has demonstrated that “social norms can have important impacts not only on social relations, but also on economic outcomes” (Nyborg and Rege 2003b, Gintis 2000). Further papers are collected in Casson (1997) or Manski (2000), Ostrom (2000), Holländer (1990) and Elster (1989).

32) This chapter is conceptually based on an interesting review by Biel and Thøgersen (2007). They also elucidate norm activation and their implications for environmental behaviour, which is not covered here. The subsections on norm enforcement by rewards and sanctioning are based Falk and Fehr (1999) and Fehr and Fischbacher (2004) as these authors are amongst the most active researchers in the “punishment”-domain.

33) These aspects and their policy implications will be addressed more closely in sections 8.1.2.3 (p. 133) and 9 (p. 139).

34) Examples include: tax evasion, getting divorced, not going to church, not voting, to go bankrupt, to be welfare dependent and so on (Benabou and Tirole 2004, p. 17).

35) Usually, offers below 30 -50 % (of the total amount available) are rejected as unfair in the Ultimatum Game. For details, see Figure 3 (p. 27).

36) From a broader perspective, however, additional evidence is always good news, no matter whether it supports or rejects a theory. The respective theory can be modified and as a result better explain real-life behaviour. Although many influential economists, including Smith (1759), Becker (1974), Arrow (1981), North (1990), Samuelson (1993) and Sen (1995), pointed out that people often do care for

the well-being of others and that this may have important economic consequences. However, these opinions did not have a strong impact on mainstream economics yet.

37) Carpenter (2007) explains: “Specifically, the demand for punishment slopes downward and is relatively inelastic with respect to price and income. If punishment preferences are linked to normative behaviour, then it makes sense that punishing behaviour is relatively inelastic with respect to price and income, because people punish primarily for social rather than economic reasons.” (p. 536).

38) Carpenter (2007) observes demand just to be slightly elastic with respect to price and inelastic with respect to income. Specifically, his regression results indicate “a 1 % increase in price reduces the quantity of punishment demanded by 1.22 % and a 1 % increase in income decreases the amount of punishment demanded by 0.27 %. At a first blush, punishment appears to be ordinary and inferior.” (p. 530).

39) We’ll discuss policy implications in sections 8 and 9.

40) Namely Marwell in Sociology at Wisconsin, Dawes in Psychology at Oregon and then at Carnegie-Mellon, Orbell in Political Science at Oregon, and Isaac and Walker in Economics at Arizona and Indiana. For a full list of publications see Ledyard’s footnotes 25-28 on p. 12-13).

41) In technical terms, the theoretically estimated outcomes generally observed in a standard linear public good game at the aggregate level are that contributions lie between the Nash equilibrium and the social optimum, and decrease over time with an end-effect (Hichri 2002).

42) Although punishment should be regarded to be part of institutional arrangements, due to the vast literature, it has its own chapter.

43) Six subjects in Fischbacher et al.’s (2001) study exhibit this behaviour. There is no deeper explanation given for that.

44) The coexistence of conditional cooperators and free-riders is of considerable importance in the policy sphere. We will address the consequences in sections 9 and 10.

45) The GSOEP is representative of the adult population in Germany. The authors used a sample of roughly 21.000 individuals from the 2005 wave of the panel.

46) Reported subjective well-being is used as a proxy measure for utility.

47) Subsection 6.3 presents the most important aspects at a glance.

48) I tried to consider just those findings, that seem to be well understood and seem to stand on solid ground throughout a larger number of publications, or that have been replicated successfully by leading scholars. Whenever contradictory results were found in similar experimental settings, I documented (enumerated) what the respective authors had found (although trying to investigate whether those contradicting findings can be explained by experimental control).

49) It is not a full a full account on all variables discussed throughout this work. Instead, references on existing chapters have been included. The focus more lies on variables and experimental findings that have not been dis-cussed up to now.

50) This is emphasized with an example: Many undergraduates believe that psychologists are intentionally deceptive in most experiments. It is for this reason that modern experimental economists must carefully nurture a reputation for absolute honesty in all their experiments.

51) Gächter and Renner (2006) hint to an initial debate by a common practice in psychology using hypothetical incentives (referred to as classroom credits, i.e., no “real” material payoffs).

52) While this fact is important in isolation, I did not find research linking the roles of punishment and group size in social dilemma situations. However, Carpenter (2004) shows that when monitoring is possible, group size will only result in lower contributions to the extent that larger groups disrupt the amount of information agents have about each other (p. 5-7).

53) For a plausible explanation of why contributions do not fall off as quickly in large groups see the discussion of the minimum profitable coalition in Davis and Holt (1993).

54) The model assumptions are mentioned in section 2.2.2.1.

55) as well as cultural differences, which we will address in section 6.2.2.6.

56) This aspect bears important policy-implications as a means for self-governance (see section 9.1.2.2).

57) See, e.g., Van Lange et al. (1997).

58) Gächter and Herrmann (2006) state: "In addition to being a collectivist economy (e.g., Gregory and Harrison (2005)), Russia was the longest-lived attempt to create a collectivist society where the individual, from the earliest childhood on, was supposed to pursue the interests of the group and to abandon the pursuit of self-interest (e.g., Clawson 1973). The goal was to create a "homo sovieticus" (Heller 1988). Scholars Herschel and Edith Alt, in their book "The New Soviet Man – His Upbringing and Character Development", write: "At the center of the communist dream is its unique vision of a society and its view of man in that society. The new social order will be cooperative rather than competitive, altruistic rather than selfish." (p. 2).

59) In a different study, Gächter et al. (2004) observe that the socio-economic background affects trust attitudes in that cooperation is significantly positively correlated to trust towards strangers and beliefs about the fairness and helpfulness of others (p. 523f).

60) Hoff and Stiglitz (2004) provide a recent account on the rule of law in Russia.

61) Furthermore, a "parental effect" can motivate parents to ensure the welfare of their children. This can cause individuals to reconsider present behaviour in light of future consequences (Torgler et al. 2008).

62) ...with a mean age of 40.2 years, a standard deviation of 11.23, and a fraction of 50 % females.

63) Torgler et al. (2008) note: "There are two different age effects operating: a life cycle or aging effect due to being at a certain stage of age and a cohort effect resulting from belonging to a specific generation. The cohort effect refers to the difference in attitudes between different age-cohorts due to generational differences in socialization, life experiences and economic conditions (Vlosky and Vlosky 1999)." (p. 7).

64) "Unfortunately that is not true: the details of the environment seem to matter. Left unexplained in the table are what I call cross-effects. The latter are very important and not well tracked in the literature. In some cases, cross-effects may even reverse the direction of effect of a variable." (p. 37).

65) However, although the price of giving is an important determinant of contributing to public goods, the behaviour of others is an equally important "stylized fact".

66) McCabe et al. (2003): "Neuroeconomics is the study of how the embodied brain interacts with its

external environment to produce economic behaviour. Research in this field will allow social scientists to better understand individuals' decision making, and consequently to better predict economic behaviour." (p. 294).

67) Arguing from an evolutionary perspective, Gurven (2004), for instance, refers to models of individual altruism, consistent with genetic selfishness, that have long been a part of behavioural biology (Trivers 1971, Gurven 2004, p. 988)

68) By the way, how pro-selfs explain their uncooperative behaviour has not yet been addressed in this work. Hints can be found in Biel and Thøgersen (2007). They state: "In a prisoner's dilemma context, Schwartz and Howard (1982) found that defectors justify their uncooperativeness by denying their responsibility for the outcome. And in a step-level public goods context, Kerr and his colleagues found that defectors tend to convince themselves that they "probably couldn't have made a difference anyway" (e.g., Kerr & Kaufman-Gilliland, 1997). The fact that defectors apply defence strategies in order to justify their defection to themselves strongly suggests that they struggle with an internal norm-pressure to cooperate." (p. 103).

69) Fehr and Fischbacher (2002) give the following explanation: "Consider the sequential PD in which the selfish player first decides whether to cooperate or to defect. The reciprocal player observes what the first-mover did and chooses his action. In the sequential case, the unique equilibrium outcome is that both players cooperate, because the reciprocal second-mover will match the choice of the first-mover. This also means that the selfish first-mover essentially has the choice between the (cooperate-cooperate)-outcome and the (defect-defect)-outcome. Since mutual cooperation is better than mutual defection, the selfish player will also cooperate." (Fehr and Fischbacher 2002).

70) Remember the crowding-out of private contributions when the government increases givings to public goods. Pure altruists may be (intrinsically) immune to the fact that total contributions / supply rise due to governmental increases in giving, while most other individuals may not.

71) From a technical perspective (for experimentalists), institutions are the technical aid to get control in game experiments and rule out unwanted "side-effects".

72) For example, many players, though not all, tend to contribute in greater amounts when they are able to observe (visibility of actions) that other players in

the group have already committed some of their endowment to the public good (Dorsey 1992, Kurzban and Houser 2001, Kurzban et al. 2001).

73) For example, Isaac et al. (1991) developed a theory of institutional framing based on “perceptions of fairness” demonstrating that what is deemed fair in one institutional setting may easily be deemed unfair in another.

74) The authors measure work effort using total hours worked, overtime hours worked and data on absenteeism.

75) According to this hypothesis, employees have a conception of a fair wage. If the wages are less than their fair wage, the effort is also less than it would have been if the wage was “fair” (Akerlof and Yellen 1990, Bregm 2008).

76) A person is a (strong) positive or negative reciprocator if he/she is willing to reward fair behaviour (positive) and to punish unfair behaviour (negative), even though this is often quite costly and provides no material benefit for the person (Gintis 2000).

77) This investigation is in line with a growing literature that focuses on the importance of personality, attitudes, or non-cognitive skills for determining the economic success of individuals also in an evolutionary context (see Bowles and Gintis 2002).

78) An answer to whether Homo Reciprocans is more successful than Homo Oeconomicus will be given in section 10.2.2.

79) Economists often refer to David Hume (1739, 1978), being the first to emphasize the central role norms play in the construction of social order.

80) There are, however, no single rules guaranteed to have a positive effect in all settings.

81) i.e., there is considerable heterogeneity within individuals (see main results in section 7.1).

82) There are plenty of definitions of social capital, most of them referring to trust and cooperation as important ingredients (see, e.g., section 6.2.2.2). Most people who cooperate expect others to cooperate as well and therefore trust others not to exploit them. Hence, trust may evoke cooperation, despite the free-rider incentives (Gächter et al. 2004).

83) Formal education is usually expressed as the level of education (secondary or tertiary) or degrees a person has obtained. Alternatively, it can be expressed as the number of years spent in education.

84) Rodriguez-Sickert (2007) figuratively states: “The way a low fine sustains cooperation may be

analogous to the way the yellow card keeps the peace on a football field. Without the card, violence escalates after the first kick to the shin; it makes no difference whether the kick was intentional or accidental. Perhaps the card gives football players the sensation that bad behaviour does not always go unpunished, suppressing their impulse to seek their own justice. Being close substitutes for reciprocity, low fines and yellow cards may sometimes stabilize norm compliance in a world of feeble social order.” (p. 12).

85) In fact, this is what societies do when they send their most anti-social individuals to prisons.

86) In the political science literature, this is often referred to as regime building. In economics, these cooperative linkages are referred to as institution building (Acre and Sandler 2001, p. 494).

87) A similar message comes from studies on treaty-making by Barrett (1988, cited in Acre and Sandler 2001), who state that treaties which achieve little in the way of a Pareto improvement are the most likely to be agreed upon.

88) This is explained by the importance of an institution that fully bypasses inefficient Nash equilibria. The authors show that such institutions can be associated with a new type of game form (correlated strategies), “where a Pareto-improving correlated equilibrium exists which does not involve Nash strategies. For example, correlated strategies represent a formalization of both the veils of uncertainty and leadership, which are essential concepts of government intervention that, heretofore, lacked any formal structure. Furthermore, abiding by the leader or institution’s correlated instructions is self-enforcing, and as such, may limit transaction/enforcement costs.” (p. 512-513).

89) We briefly stressed this in section 7.5.

90) Frey and Torgler (2004) provide the most direct evidence on the relevance of conditional cooperation for tax morale as they find a positive correlation between peoples’ tax morale (measured by a question whether cheating on tax is justified if you have the chance) and peoples’ perception how many others cheat on taxes. The prevalence of corruption also seems to be influenced by motivations similar to conditional cooperation (see Abbink et al. 2002 for an experiment and further references to related literature).

91) What Ledyard here refers to are the institutional design mechanisms proposed in Groves and Ledyard (1977), which, in game theoretic terms, imply that

the prescribed behaviour must form a Nash equilibrium. In other words, the design of the institution must assure that participating individuals have an incentive to act in accordance with the institutional rules and contribute to the public good, once the institution is formed. This holds for the Grove-Ledyard mechanism (if parameters are chosen carefully), according to Kosfeld et al. (2006).

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