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# 1 Complementary Studies on Trust and Cooperation in Social Settings: An Introduction

Rigorous sociologists should develop sound theoretical predictions to be tested with high-quality empirical research rather than produce ‘teutonischer Tiefsinn’ devoid of empirical content.

Werner Raub

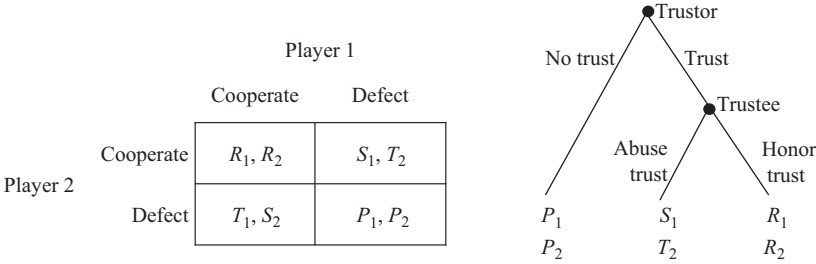
## 1.1 Background

The issue of cooperation has been a core topic in the social sciences for a long time, and for good reasons. Many societal matters share that everyone involved knows what they would prefer to see happening, but the incentives are such that this is hard or even impossible to achieve. Examples are abundant, and play at different levels of granularity. At the societal level, one could think of (trying to prevent) the depletion of collective resources or transitioning to a more sustainable society. At the level of organizations, one could think of trying to overcome the impulse to benefit in a business relation at the expense of the other party, or of the tendency for businesses to use legal constructs to evade taxes. Regardless of the grandiosity of these cooperation problems, similar arguments play a role in the provision of collective goods in neighborhoods or households, and even within a single person there can be friction between the current and the future self.

The academic literature has coined the term “social dilemmas” for these kinds of interactions in which sensible decisions by individual actors lead to an outcome that is inferior for all (see Raub, Corten, and Buskens 2015 for a more technical definition). For those unacquainted with the general topic, this sounds hard to imagine. How can it be that we end up in a situation where everybody agrees that an alternative outcome was possible that is better for everybody? Nevertheless, many well-known cooperation problems share this feature. The canonical example of such a problem is the famous Prisoner’s Dilemma (Luce and Raiffa 1957: 94–95; Axelrod 1984). In this game for two actors, the two actors simultaneously choose between two actions, *Cooperate* or *Defect*, and the four outcomes that can result from these choices have benefits for both actors as in the left panel of Figure 1.1. Both actors, considering the potential choices of the other player, will conclude that to defect benefits them more than to cooperate, irrespective of what the other actor does,

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**Figure 1.1:** Prisoner's Dilemma (left) and Trust Game (right) ( $S_i < P_i < R_i < T_i$ ,  $i = 1, 2$ ).

and hence to defect is the rational course of action for each of them. Two actors who think this way will end up with the payoffs that go with mutual defection, even though mutual cooperation would have yielded a better outcome to both.

Another type of exchange that differs from the Prisoner's Dilemma in important aspects but nevertheless shares its social dilemma nature is the *Trust Game* (Dasgupta 1988), illustrated in the right panel of Figure 1.1. In this game, the moves are sequential rather than simultaneous. In the first move, the “trustor” chooses whether or not to place trust in the “trustee.” If the trustor indeed decides to place trust, the trustee decides whether to honor or abuse it. The outcomes of the Trust Game are such that after trust is placed, abusing trust is more beneficial for the trustee than honoring trust. The trustor, anticipating that the trustee will abuse trust if it is placed, will reasonably decide not to trust the trustee. As in the Prisoner's Dilemma, both actors end up in a situation that is suboptimal as mutual cooperation (the trustor placing trust and the trustee honoring trust) would be a better outcome for both.

The explanation of these, already very well-known, abstract interactions immediately suggests both how theoretical arguments about cooperation problems can take shape and how scholars have tried to tackle the analysis of cooperation and trust problems. For one, these games make clear that not all social dilemmas are equal. Some fit better with the Prisoner's Dilemma, where choice is simultaneous, whereas others resemble a Trust Game, where choice is sequential. Other types of games are often natural extensions of these archetypical ones. It can be sensible to assume more than two actors, more than just two behavioral choices, different kinds of payoffs, uncertainty about choices or payoffs or the type of other players, to assume repetition of interactions, embeddedness of the interactions in a larger setting, or different rules about behavior or outcomes.

Theoretical social scientists have covered a variety of such models, trying to identify the conditions under which cooperation may emerge. Such explanations may take place at several levels (cf. Kollock 1998). At an individual level, alternative psychological assumptions on preferences or rationality may be introduced to explain why individuals cooperate (see Gächter 2013). Another approach is to maintain

the standard assumptions that actors are rational and selfish, and instead look for features of *social* conditions that make the emergence of cooperation possible (see Buskens and Raub 2013). This is the approach typically taken by sociologists, following Coleman's (1987) suggestion that sociological theory ought to keep assumptions on individual behavior as simple as possible, in order to be able to study complex mechanisms on the social level in more detail. Nevertheless, also theoretical work that is primarily interested in social mechanisms often requires careful consideration of micro-level assumptions. Several well-known conditions that can facilitate cooperation included individual actors being involved in repeated interactions (Axelrod 1984), actors organized in social networks (Raub and Weesie 1990), and institutional arrangements that facilitate trust or cooperation (Greif 2006). Many authors in this volume build on one of these lines of research for explaining cooperative behavior in social dilemmas.

Part I of this book collects advancements in theoretical work in this area. In this part, some authors focus more on the essence of the trust or cooperation problems, while others concentrate more on the psychological assumptions and social conditions that can foster trust and cooperation. In addition to and in synergy with this theoretical work, researchers have invited people to the social science laboratory and have had them actually play these and similar kinds of games, trying to figure out whether or not the predictions that theoretical social science has come up with, fit with the behavior of people under strict laboratory conditions. We showcase work that fits this tradition in Part II. Finally, some research ventures outside the lab and confronts the predictions of cooperation theory, especially the ones that seem to hold under controlled conditions, with the empirical reality of everyday life. We show this kind of work in Part III.

The combination of, on the one hand, careful consideration of micro-assumptions using formal theoretical reasoning, and, on the other hand, testing of hypotheses under controlled laboratory conditions and under blurry real life conditions, is both a strength of the research on cooperation problems and a source of further complexity. Using mixed-methods with different strengths and weaknesses offers a potentially more robust set of explanations for societal phenomena (see Levitt and List 2007; Buskens and Raub 2013; Jackson and Cox 2013; Raub 2017). Rigorous or even formal theory ensures that assumptions are made explicit and concrete. Experimental testing can, as much as reasonably possible, try to fix characteristics of the interaction so that the observed behavior can be tested relatively independent of interfering factors. Field studies then assess whether the ideas about which conditions govern behavior are strong enough to survive in a noisy setting. The connection between these levels, however, is not always obvious. Ideas about individual preferences or behavior do not necessarily automatically translate to obvious or desired consequences at the collective level (Coleman 1987). The assumptions underlying the formal theory can be easily contended to be too strong abstractions and unsupported tests of predictions in both experimental and field studies leave open where to improve. Should theory

be improved, perhaps using more realistic assumptions? Is the empirical test not warranted under these conditions, or did the prediction simply massively fail? It is this interplay of individual-level modeling combined with more and less rigorous testing that we seek to demonstrate in this volume.

## 1.2 Theoretical contributions

The theoretical contributions in this volume all fit within the general theoretical framework of methodological individualism and follow Coleman's (1987) theoretical approach that emphasizes the importance of specifying micro-macro transitions in sociological theory. Within this general theoretical framework, the theoretical elaborations can roughly be divided into three categories.

The first category could, with a nod to Coleman's (1990) seminal work, be described as being concerned with the *foundations of sociological theory* on cooperation problems. The first two contributions focus on the non-trivial and much-debated question of selecting the appropriate model for individual decision making, representing the micro level of Coleman's (1987) celebrated meta-theoretical scheme. **Voss** evaluates the use of assumptions of rational egoism (related to the Hume-Buchanan doctrine) in institutional design and argues that, while non-standard assumptions (such as assumptions on bounded rationality) may be useful in institutional *analysis*, institutional *design* is still better served by the standard assumptions of rational egoism. **Opp** discusses the extent to which micro-level models of human decision making known as dual-process theories – in particular the MODE model (Fazio and Olson 2014) and the Model of Frame Selection (Esser 1990) challenge more conventional rational choice theory, and concludes that such theories complement rather than contradict rational choice theory. While the selection of micro-level models has received much attention in the literature, **Van Assen and Dijkstra** draw, in the last chapter of this first category, attention to the macro side of Coleman's famous advice that sociological theory should simplify mostly at the micro level but as little as possible at the macro level. Using the case of exchange theory as an illustration, they argue that the issue of "sufficient complexity" is too often neglected in sociological theorizing, leading to models that are oversimplified at the macro level and therefore lack ecological validity.

The second category of theoretical contributions focuses on a specific way of trying to solve the social dilemma structure: the role of reputation in the emergence of cooperation and trust. This topic has been central to rational choice-oriented sociology ever since Granovetter's (1985) programmatic paper on the "problem of embeddedness" and Raub and Weesie's (1990) first game-theoretic elaboration of that program. **Flache** builds on the seminal work by Raub and Weesie (1990) on embeddedness effects on cooperation, extending the analysis to "large number dilemmas" (Raub 1988), in particular collective good production under uncertainty. Focusing

on core-periphery networks, the theoretical analysis suggests that in such networks situations may emerge in which the core is exploited by the periphery. **Lindenberg, Wittek and Giardini** challenge the view that human cooperation can be explained by reputation effects based on rational choice and selfishness assumptions alone (“Granovetter’s error”), and argue that reputation effects cannot be studied without also considering the dynamics of normative embeddedness. **Van de Rijt and Frey** build on their earlier work on *reputation cascades*, a previously overlooked dynamic of reputation systems (for instance occurring in online markets) by causing arbitrary inequality in payoffs between trustees (Frey and Van de Rijt 2016). They show by means of computational methods that their initial findings are robust against the relaxation of two restrictive assumptions of the earlier model, namely, that information is transferred automatically and reliably and that interaction sequences are relatively short. **Flap and Ultee** reflect upon the effectiveness of “organized distrust”, or the extent to which actors in powerful positions are systematically scrutinized to prevent them from exhibiting opportunistic behavior.

The third category contains theoretical contributions that deal with cooperation more broadly and model effects of information exchange and networks based on well-specified micro-assumptions. **Hegselmann** studies two currently much-debated social phenomena – polarization and radicalization of opinions – as extensions of the bounded confidence model. Using agent-based modeling, he shows that for both types of phenomena bridges are of crucial importance, but also that results may depend strongly on small differences in parameters, highlighting the complexity of micro-macro transitions in these phenomena. **Bojanowski** considers individual benefits of network positions, building on Burt’s (1992) structural holes model. Using an agent-based model as well, he shows that informational properties of collaborative relations should be analyzed not only at the node or tie level, but also at the triadic level to appreciate the full spectrum of possible redundancies in information. He ends with suggestions for empirical work to test his theoretical conjectures. **Gautschi** proposes a new theoretical model in the domain of network exchange that, contrary to existing sociological models of network exchange, systematically takes into account that negotiation partners pursue their self-interest and thereby specifies the actors’ optimization problem more explicitly.

The consistency among the theoretical chapters, despite the broad range of substantive topics addressed, illustrates the usefulness of a common meta-theoretical approach. In particular, it shows the ability of Coleman’s macro-micro-macro framework to force researchers to be explicit about what the individual-level assumptions are and to take the often complex link between the micro and macro level seriously. Any categorization of chapters is to some extent artificial, but the underlying consistency of the theoretical chapters is also illustrated by the fact that one could easily arrive at alternative categorizations. For example, besides the more foundational chapters, most of the chapters are in one way or the other concerned with micro-level assumptions in the theories discussed, with the chapter

by Lindenberg et al. providing the most obvious bridge between the “foundations” and “reputation” categories. Similarly, the chapter by Gautschi not only relates to Van Assen and Dijkstra’s chapter by criticizing existing theories of network exchange (although from a different angle), but also makes an explicit effort to draw network exchange theory closer to the theories typically applied in the literature on cooperation and reputation by incorporating elements of non-cooperative game theory. Also, the contributions by Flap and Ultee on the one hand and Voss on the other are concerned with issues of institutional design. Finally, and perhaps most obviously, in many of the theoretical contributions the notions of social networks and embeddedness play an explicit or implicit role.

### 1.3 Experimental tests

Part II consists of chapters that consider experimental tests related to social dilemma problems. All chapters can once again be linked to Coleman’s macro-micro-macro framework. A first category of chapters focus more on the micro level, studying the role of individual preferences, identities and priming. The second category of chapters zooms in on how framing of the individual choice situation can affect behavior in social dilemmas such as the previously mentioned Prisoner’s Dilemma and its multi-player variant, the Public Goods Game. The last category of chapters in this part uses experiments to test how social and institutional embeddedness might solve cooperation problems.

Two chapters fall in the first category. **Aksoy** studies an extension of social value orientation theory for the situation in which there are ingroup and outgroup others, as opposed to the more standard assumption that preferences are such that all others are considered equivalent. He finds, using an experimental test based on the Decomposed Game, that many subjects show ingroup bias in the sense that they add an extra negative weight to outcomes of the outgroup when the outgroup is better off than the ingroup. **Winter and Diekmann** replicate and extend an experiment by Vohs, Mead, and Goode (2006) in which it was argued and shown that framing individual decisions explicitly in terms of a money frame matters for decisions of participants. However, the same kind of priming does not lead to differences in behavior in several strategic situations, such as the Ultimatum Game, Trust Game, Prisoner’s Dilemma, and Volunteer’s Dilemma. This contrasts with results that are observed using other priming manipulations (Lieberman, Samuels, and Ross 2004), highlighting the theoretical puzzle we alluded to above: under which circumstances are more psychological additions to standard game-theoretic arguments needed to understand behavior in strategic situations?

**Abraham, Lorek and Prosch** is the first chapter that focuses on micro-level assumptions in social dilemma games. They study how a frame of being a member of a

group affects behavior in Public Goods Games and Chicken Games. They distinguish between treatments in which the frame is without any further obligations and treatments in which the frame implies a minimum contribution or a cost to enter. They show that, in both games and under different experimental circumstances, framing is effective and increases cooperation. When the cooperative frame comes at a cost the effects tend to be smaller, but only in one experiment this difference is significant. **Esser** provides an insightful comparison of the application of different versions of rational choice theory as well as of the model of frame selection in explaining behavior in Public Goods Games with a punishment option. He argues that the micro-level assumptions related to frame selection are superior in understanding these behaviors compared to different versions of rational choice assumptions, especially given the behavioral patterns when actors change between conditions with or without punishment. This is another chapter that illustrates the challenge of including psychological aspects for understanding cooperative behavior, but at the same time shows its potential for further steps in this direction given careful reconstruction of existing experimental work.

The last three chapters in this part discuss different forms of institutions in relation to different types of cooperation problems. **Engel and Ockenfels** evaluate an interesting instrument to prevent cooperative behavior in a situation in which this is societally undesirable, namely, collusion between suppliers in a market with few suppliers. Using an experiment resembling a Cournot market, they contend that in markets in which collusion between competitors is likely, the introduction or existence of an actor with competitive social preferences (a “maverick”) puts the collusion between firms under pressure. Therefore, it seems a good strategy to protect mavericks in markets in which cartels are easily formed, but undesirable from a societal view point. **Corten, Buskens, and Rosenkranz** start from a more standard rational choice perspective and test experimentally in which scenarios conditions for cooperation seem to be more beneficial, crossing conditions in which reputational information about behavior in Prisoner’s Dilemmas can be exchanged with conditions in which subjects can choose with whom to play these dilemmas. They cannot confirm that the availability of networks through which reputation can spread promotes cooperation in this case. However, they do find that learning effects play a role in the sense that initial cooperation levels affect cooperation in the long run. They also find that partner choice alone, without possibilities for reputational information spread, jeopardizes cooperation. These findings suggest that standard rational choice models do not suffice to understand how network related mechanisms affect cooperation in exogenous and endogenous networks. **Barrera, Buskens, and De Rover** study the effects of positive and negative sanctions in repeated Public Goods Games. They show that punishments have a stronger effect on cooperation than rewards. They also show that group solidarity is not lower in groups in which punishments could be given compared to groups in which rewards could be given. Apparently, the level of cooperation that is reached in a group is

more important for group solidarity than whether the sanctions to reach this are positive or negative.

The results of this last chapter in Part II again illustrate links between the chapters in this book. The findings of the last chapter suggesting that standard rational choice assumptions do not suffice to understand cooperation in dynamic networks illustrate that the efforts of the earlier chapters in Part II, on which individual-level assumptions seem more empirically valid, are also important for the more complex networked games. The chapter links as well to some of the theoretical contributions in Part I studying the effects of more complex assumptions in networked social situations on micro and macro-level outcomes.

## 1.4 Field studies

Part III considers a variety of contexts in which the mechanisms related to trust and cooperation are empirically tested in the field, underscoring that these mechanisms are applicable in areas as diverse as organizations, households, neighborhoods and networks of adolescents (cf. Raub and Weesie 2000). The first three chapters focus on the organization of bilateral relations, between firms and within households. The last two chapters in this part inquire into networked settings such as neighborhoods and classrooms and the consequences of these networks.

**Rooks, Snijders, and Tazelaar** consider how organizations create the rules that govern their (contractual) interactions. They contrast the view that rules are rational adaptations to the given circumstances with the view that rules are merely irrational coincidences. Their empirical analyses suggest that existing rules tend to lead to more elaborate ex ante investments, and do not necessarily improve eventual exchange performance. Apparently, the classical Weberian view that rules and rule-following are crucial elements to be able to reap the benefits of specialization through division of work needs additional argumentation about the emergence of these rules, as organizational evolution does not seem to automatically converge to the optimal sets of rules. This once again highlights the potential of incorporating micro-assumptions that are descriptively more accurate into frameworks that are based on rational profit maximization. **Koster** continues the search for empirical evidence on how organizations solve problems of trust and cooperation by considering whether organizations that collaborate on Human Resource issues are more innovative than those who do not. It turns out that organizations that do collaborate are more innovative. This reveals that, next to more standard approaches that emphasize compatibility of resources, shared cooperative endeavors can have positive consequences on organizational innovativeness as well. **Roeters, De Ruijter, and Van der Lippe** turn our attention to households, where similar trust and cooperation arguments play a role as between firms, albeit at the interpersonal rather



than interorganizational level. Their analysis on the provision of informal care shows that, even though the content and subjective experience of human relations are completely different from those in organizational interaction, theories of trust and cooperation are usefully applicable and can shed light on the conditions under which collective goods problems are solved. Informal care is less extensive when there are more coordination problems, through for instance the combination of busy day-jobs with many other roles. An interesting puzzle remains, however, as those with more general skills spend less rather than more time in informal care, highlighting the complicated issue of how to link the micro-level behavior of humans to the outcomes at the aggregate level.

**Volker** shifts attention to a level in between that of personal and organizational relations: the collective efficacy of neighborhoods. Similar to organizations, neighborhood members choose, given a certain level of trust between them, the rules that define the formal and informal control on behavior in neighborhoods. This in turn determines how well the neighborhood is dealing with the provision of its collective goods, such as the availability of mutual help and a lack of unwanted behavior. In this sense, there is an obvious parallel between this chapter and that of Rooks et al. Although the relation between trust, control, and collective efficacy is theoretically demanding, the results suggest that trust and control are only moderately related across Dutch neighborhoods. Moreover, trust seems to be related to collective efficacy more than control is. Especially the fact that trust and control do not seem to reinforce each other, is an interesting avenue for future theorizing and empirical research. **Snijders and Kalter** switch back and forth between micro-foundations and macro testing in a study on cooperative ties and social cohesion in classrooms. Making use of the Stochastic Actor-Oriented Model (Snijders and Steglich 2015), they tackle the empirical puzzle that the number of mutual within-classroom friendships is declining as a function of the proportion of Muslims in a class, whenever Muslims are a minority. Successive iterations of increasingly realistic models hint at an explanation that is based on the idea that friendship ties between ethnically diverse students are more sticky, although the models cannot completely explain the phenomenon away. We see here that slight variations in micro assumptions matter, as well as that the transition from micro behavior to macro-phenomena, once again, is far from trivial.

Summarizing, Part III shows that field studies can illustrate which theoretical predictions consistently replicate in different contexts. In addition, most studies also produce new puzzles that require further theorizing using alternative assumptions about micro-level decision making and more elaborate inclusion of macro-level conditions. This requires further theoretical studies and different types of empirical tests of the new theories to establish whether the new explanations are more encompassing than the earlier ones.

## 1.5 Conclusion

This collection of chapters not only shows a way in which research on trust and cooperation problems can and perhaps even should progress, but also how rigorous sociology in general could progress more consistently. It is a combination of careful theorizing, when necessary at the individual level, to figure out how individual preferences can lead to behavior under different circumstances, combined with a core of rigorous model building that can help ensure that theorizing is consistent and extendable. We then see that the link from micro to macro level often requires explicit theoretical arguments to include the necessary interdependencies between individuals and reveal unintended consequences of individual behavior. In addition, the meticulous testing of arguments under first ideal, but progressively realistic circumstances to compare the predictions with actual behavior, and finally the tests of general insights at the intricate level of reality where everything is related to everything else. If predictions fail, theory needs to be updated, ideas amended, and conditions become more specific. This mix of methods can help to overcome a tendency of getting tied up into prohibitively local problems and to keep an open mind for the struggles, solutions, and victories of researchers in seemingly other, but actually related areas.

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