A Behavioral Turn to the International Law of Global Public Goods and Commons

Anne van Aaken¹

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Abstract

Global public goods and global commons are of immense interest to international lawyers. They are characterized by pressing cross-border problems and thus need horizontal cooperation. This makes the system sensitive to collective action problems. Most international lawyers are not informed by an explicit behavioral theory since their work is either doctrinal or conceptual. In contrast, large parts of international affairs and Law and Economics scholarship have been dominated by the rationalist paradigm for analyzing those problems using game theory which has been proven highly deficient on the local level. The main deficit of both discourses in international law is that they are not well informed by behavioral insights derived from psychological and economic experiments. This article is a first attempt to fix this, closing a research gap. What behavioral economics can offer is actual experiments, investigating the behavior of actual people, from which in turn one can extrapolate to what is likely to work in international collective action constellations.

This article submits that behavioral insights from public good games can contribute to our understanding and design of international law on global public goods and commons and show that it already incorporates some important variables for cooperation which are neglected by rational choice theories. This in turn has important repercussions for the assessment of the treaties that are already in place and help to design new treaties. Behavioral economics has a more optimistic view on the possibility of sustained international cooperation.

Keywords: International Law, Global Public Goods, Commons, Behavioral Economics, Climate Change, Fisheries

¹ Professor for Law and Economics, Legal Theory, Public International Law and European Law, University of St. Gallen, from August 2018 on: Alexander von Humboldt Professor, University of Hamburg.
I. Introduction

Climate change and overfishing, to name only a few global problems, need international cooperation. These issues present some of the greatest challenges to international law since they not only represent the most pressing problems for the world but also the toughest problems for international cooperation. Collective action problems (or so-called social dilemmas) in international relations are assumed to be difficult to solve due to problems like free-riding on global public goods (GPG), overuse of common pool resources (CPR), begging-thy-neighbor etc. coupled with a missing central authority in international law. Many scholars dealing with global collective action problems focus on the behavior of states as single entities, assuming states rationally and strategically pursue their interests. Game theory is underlying the analysis and non-compliance prognosis is common. As held by Brunnée: “in the context of MEAs [Multilateral Environmental Agreements, AvA], compliance scholarship has been dominated by rational institutionalism and by a debate between proponents of managerial and enforcement-oriented models”; the constructivist school coming in later only. Compliance theories are also theories about “the nature and operation” of international law more generally but this article confines itself solely to collective action problems in international law. The rationalist picture remains pessimistic on the possibility of enduring cooperation. Is this pessimism justified? The rational choice paradigm as used in economics has been thoroughly challenged since the 1970s by psychological and economic experimental research and has

3 See ibid, relying on the rationalist approach. This article refers to them concerning the rationalist starting point.
5 Ibid.
7 This paradigm comes mainly in two forms: either for individual decision-makers in decision theory or in game theory as a theory of strategic interaction. The central tenets are utility maximization, stable preferences, rational expectations, and optimal processing of information. Preferences are usually assumed to be entirely self-regarding and non-emotional. Rationalist theories in international relations, notably realism, institutionalism and political economy (cf. George W. Downs, David M. Rocke and Peter N. Barsoom, 'Is the Good News about Compliance Good News about Cooperation?' (1996) 50 International Organization 379), have long dominated especially the compliance debates. They conceive of states as strategic actors that proceed on the basis of rationally assessed and pursued self-interest. See the discussion in Kingsbury, 'The Concept of Compliance as a Function of Competing Conceptions of International Law'. For a discussion with a view on climate change treaties, see Brunnée, The Kyoto Protocol: A Testing Ground for Compliance Theories?.
revolutionized huge parts of economics. But those behavioral insights have hitherto mainly escaped research on international law generally and on GPGs and CPRs specifically, creating a research gap.\footnote{But see lately Anne van Aaken, 'Behavioral International Law and Economics' (2014) 55 Harvard International Law Journal 421; Tomer Broude, 'Behavioral International Law' (2015) 163 University of Pennsylvania Law Review 1099.} although the research is taking off in international relations scholarship.\footnote{Emilie M. Hafner-Burton and others, 'The Behavioral Revolution and International Relations' (2017) 71, Supplement 2017 International Organization S1. This research still does not pay attention to international law.} Ostrom, a political scientist turned economic Nobel laureate, laments: “We have not yet developed a behavioral theory of collective action based on models of the individual consistent with empirical evidence about how individuals make decisions in social-dilemma situations.”\footnote{Elinor Ostrom, 'A Behavioral Approach to the Rational Choice Theory of Collective Action' (1998) 92 American Political Science Review 1, 1.}

Disputes about whether international cooperation in the realm of GPG and CPR is effectively possible will not end. But the discussion should be informed about the insights we have from social science, including psychology about how people behave, under what circumstances they cooperate, how they create social order and enforce it. Thus, I explore psychological\footnote{I use psychology and behavioral economics interchangeably. The experiments conducted since about 30 years have been undertaken by psychologists as well as economists; both seek to understand the deviation from the rational choice assumptions.} insights to analyze problems of GPGs and CPRs in international law.

This can help to assess problems we are currently facing: the United States has withdrawn from the Paris Agreement.\footnote{UNFCCC, Decision 1/CP.21, ‘Adoption of the Paris Agreement’ (29 January 2016) UN Doc FCCC/CP/015/10/Add.1, Annex (Paris Agreement).} Whereas some commentators might see this as fatal to international cooperation on climate change, others do not. Can we use psychological insights to understand better what might happen to cooperation under the Paris Agreement? I submit we can and should use them since they also inform us about what is needed to uphold cooperation of the remaining States.

Some collective action treaties already incorporate behavioral insights, more than would be expected would it be purely based on rational choice design, unexpectedly for me when starting to write this article. What can behavioral research then add when designing international law for those problems? Just as people have always washed their hands, it is only since the discoveries of Virchow and Semmelweis that we know why hand washing prevents illness – and we changed habits accordingly. Clearly, also in the international law of GPGs and CPRs, an intimate relationship between empirically informed behavioral analysis and institutional design is desirable. Behavioral insights are thus worth examining – both to enhance how we

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describe legal regimes but also to possibly affect and improve their levels of compliance, implementation, and possibly their effectiveness in securing their substantive goals. Although taking a rationalist starting point, including its basis of underlying incentive structure and not dismissing that strategic interest are also at play, I submit that we have to enrich the analysis of international law in collective action constellations with insights how people really behave. Such an inquiry opens a fascinating range of new possibilities about how international law on GPGs and CPRs might matter to its subjects and is capable of affecting state behavior. First, I describe the experimental method including the results of which factors matter for enduring cooperation and argue why it is appropriate to use it for international law. (II.). I then turn to collective action problems in international law with examples from GPG and CPRs, with a focus on climate change law (GPG) and fisheries (CPR) (III.). The last part concludes (IV.).

II. The Insights of Behavioral Economics for Global Collective Action Problems

Two metaphors are commonly used to predict the possible cooperation between actors, including states: First, the “Tragedy of the Commons”, second, the “Logic of Collective Action”. GPG and CPR are usually modelled as a prisoner’s dilemma game where (in a non-repeated game) non-cooperation is predicted by rationalist scholars. In infinitely repeated social dilemmas, a multitude of outcomes from the very best to the very worst without any hypothesized process for how and why actors might achieve more productive outcomes, are predicted. Furthermore, any talk between the actors seen to be “cheap talk”, that is, promises are unenforceable due to the second-order enforcement problem; enforcement and punishment will usually not take place. Therefore, not or not easily enforceable MEAs, such

14 Compliance has to be distinguished from effectiveness. Whereas compliance refers to whether or not a state’s conduct meets the prescribed legal standard, effectiveness measures whether the law has changed a state’s behavior from what it would have been in the absence of the law. Instead of many, see Timothy Meyer, ‘How Compliance Understates Effectiveness’ (2014) AJIL Unbound https://www.asil.org/blogs/how.
15 As analyzed by Garrett Hardin, 'The Tragedy of the Commons' (1968) 162 Science 1243.
16 As analyzed by Mancur Olson, The Logic of Collective Action (Harvard University Press 1971).
17 This game shows why two completely “rational” individuals might not cooperate, even if it appears that it is in their best interests to do so; they would be better off as a group if cooperating.
19 Enforcement, if costly to the punisher, is another prisoners’ dilemma since all actors prefer to free-ride on the enforcement measures by other players.
as the Paris Agreement, are not expected to have any behavioral force.\textsuperscript{21} Does this mean that stable cooperation for GPG or commons, e.g. in climate change, is impossible? Notably, predictions based on rational choice models “are not supported in field research or in laboratory experiments in which individuals face public good (PG) or CPR problems and are able to communicate, sanction one another, or make new rules.”\textsuperscript{22} Policies based on the theoretical insight of Hardin’s “Tragedy of the Commons“, e.g. privatization, have been subject to major failure and have exacerbated the very problems they were intended to ameliorate.\textsuperscript{23} A micro-analysis of behavior based on experimental evidence thus promises better knowledge of which institutional design features in collective action treaties matter and especially why. Collective action problems as they arise in GPG and CPR constellations can be conceptualized as a PG game (1.). Possible objections against the use of psychological insights in international relations are then discussed (2.). Then, I turn to the factors which have been identified to enable enduring cooperation (3.).

1. Public Good Experiments

Behavioral insights do not entirely discard rationalist assumptions of strategic interests but they hint to other factors which are important for international cooperation. Experiments are used to observe peoples’ social preferences and cognition under controlled conditions. They can be conducted in the field or in laboratory settings, whether of individual or group (that is inter-personal) behavior. The experimental approach is a promising research method because it best secures internal validity.\textsuperscript{24} Experiments on social preferences which are at the forefront of cooperation in PG and Commons, use game theory including the ultimatum game,\textsuperscript{25} the dictator

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\item \textsuperscript{22} Elinor Ostrom and others, ‘Revisiting the Commons: Local Lessons, Global Challenges’ (1999) 284 Science 278, 279.
\item \textsuperscript{24} In scientific research, internal validity is the extent to which a causal conclusion based on a study is warranted, which is determined by the degree to which a study minimizes systematic error. It contrasts with external validity, the degree to which it is warranted to generalize results to other contexts. Shane R. Thye, ‘Logical and Philosophical Foundations of Experimental Research in the Social Science’ in Murray Webster and Jane Sell (eds), \textit{Laboratory Experiments in the Social Science} (Laboratory Experiments in the Social Science, Elsevier 2007).
\item \textsuperscript{25} The experiments started with the so-called Ultimatum Game. See Werner Güth, Rolf Schmittberger and Bernd Schwarz, ‘An Experimental Analysis of Ultimatum Bargaining’ (1982) 3 Journal of Economic Behavior and Organization 367. The proposer makes an offer of how to share a given amount (usually money) and the recipient can accept or reject the offer. In case of acceptance, the offered division is implemented; in case the recipient rejects, both get nothing. If the recipient is motivated solely by monetary payoffs, he or she will accept every offer. Therefore, the proposer will only offer the smallest money unit: this is expected by the \textit{homo oeconomicus} hypothesis but not found in the experiments. This is attributed to fairness considerations which are, when left unfulfilled, are punished even if costly to the punisher.
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game, trust games which have been extensively played in different forms. Ultimatum game experiments, e.g., have shown that people are generally willing to sacrifice monetary rewards for reasons of fairness when offered (too) low allocations, thus behaving inconsistently with simple models of self-interest as used in rationalist models.

Even more targeted for our research question are public good games which are standard in experimental economics. They mimic the incentive structure of PG and CPRs in the lab. They are used to explore the contribution to public goods (where rational choice would expect free-riding) and come in different experimental designs. The results challenge rationalist theories of human cooperation that neglect: (1) reciprocity strictu sensu, (2) the distinction between (perceived) fair and unfair sanctions, (3) altruism, spitefulness and tastes for equality, (4) the role of trust and communication, (5) the intentions of the other players, and (6) the "type" of the actor. Those factors are “probably relevant in all domains in which voluntary compliance matters.”

Has rationalist game theory been correct that cooperation is inherently unstable and tends to unravel to the worst outcome, predicted by self-interest? The answer is a qualified “no”: the “strong free-rider hypothesis” has been proven wrong. For most social dilemmas, experiments show that cooperation levels far exceed the predicted levels and are systematically affected by factors and variables that play no role in rational choice theory in affecting outcomes. Field

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26 The “dictator” determines how to split an endowment (such as a cash prize) between himself and the second player. The second player simply receives the remainder of the endowment left by the dictator. Most people all over the world share the endowment, although there is no sanction for not doing so. This contradicts the rational choice assumption. For a meta-analysis, see Christoph Engel, 'Dictator Games: A meta Study' (2011) 14 Experimental Economics 583. For details, see Ernst Fehr and Klaus M. Schmidt, 'The Economics of Fairness, Reciprocity and Altruism – Experimental Evidence and New Theories' in Serge Kolm and Jean Mercier Ythier (eds), Handbook of the Economics of Giving, Altruism and Reciprocity Vol I (Handbook of the Economics of Giving, Altruism and Reciprocity Vol I, Elsevier 2006).

27 The trust game is similar to the dictator game, but with an added first step. First, one participant decides how much of an endowment to give to the second participant, and this amount is typically multiplied by the researchers. Then the second participant (now acting as a dictator) decides how much of this increased endowment to allocate to the first participant.

28 Each of these n subjects in the group is given an initial endowment of money (so called tokens). They can then choose to contribute some of their endowment to the public good. The contribution to the public good thus benefits each group member by k=n. An individual who contributes one unit to the public good thus benefits the group as a whole, since k is greater than one, but loses out herself, since k=n is less than one. The best outcome for the group as a whole is that each individual should contribute her full endowment to the public good. However, each individual has an incentive to free-ride on everyone else’s contributions. Standard economic theory predicts that nothing is contributed to the public good. This prediction is known as the “strong free-rider hypothesis”.

29 Due to space restrictions, I cannot describe each design in detail but concentrate on results, but references contain the description of the experiment.


31 For an extensive discussion of those pillars, simultaneously giving an overview on the experiments so far conducted, see Simon Gächter, 'Human Pro-Social Motivation and the Maintenance of Social Order' in Eyal Zamir
research also shows that individuals systematically engage in collective action to provide local PG or manage CPRs without an external authority enforcement.\textsuperscript{32} Individuals achieve results that are "better than rational"\textsuperscript{33} by building conditions in which reciprocity, reputation, and trust can help to overcome the strong temptations of short-run self-interest.\textsuperscript{34} Indeed, following strict rationalist assumptions, would make it difficult to understand why States create treaties on GPGs and CPRs and bear the respective transaction costs in the first place since they would expect non-compliance anyhow.

2. Application of Experimental Insights to States?

Insights of behavioral economics have been applied to law concerning corporate actors, e.g. in corporate law, antitrust or finance as well as regulation. Is it justifiable to apply psychological insights to states? It opens, first, the problem of external validity of the experiments on which the behavioral theories are based since states cannot be put in the lab\textsuperscript{35} and second, the problem of the relevant unit of analysis when we deal with international law.\textsuperscript{36} First, theories explaining state behavior in order to explore whether international law has any behavioral force, e.g. realism, institutionalism or international law and economics, assume states to be rational actors. Their assumption thus exhibits a strong disconnect between the behavioral assumptions for states on the one hand and behavioral insights for individuals on the other hand. This would need justification, not the other way around. Behavioral economics "suggests that the standard economic approach to climate change policy, with its focus on narrowly rational, self-regarding responses to monetary incentives, is seriously flawed."\textsuperscript{37} Second, most scholars analyze collective action problems based on a unitary state assumption. But developments in international law in the last 50 years might have changed its character with multiple actors on the scene. This is especially true for international environmental law dealing with GPGs and CPRs.\textsuperscript{38} They are increasingly seen as complex multi-actor, multi-sector, and


\textsuperscript{35} But see the call for experiments in international law, Adam S. Chilton and Dustin H. Tingley, ‘Why the Study of International Law Needs Experiments’ (2013) 52 Columbia Journal of Transnational Law 173. Political psychology in international relations has a long history; see Rose McDermott, \textit{Political Psychology in International Relations} (Michigan University Press 2004) and is taking off, see the special issue “The Behavioral Revolution and International Relations”, 71 International Organization (2017).

\textsuperscript{36} For details, Aaken, ‘Behavioral International Law and Economics’, 439-449.


\textsuperscript{38} Patricia Birnie, Alan E. Boyle and Catherine Redgwell, \textit{International Law & the Environment} (Oxford University Press 2009), 268-335.
multi-level products. If Slaughter is correct that international law starts to look like a “Lego World”, the different relevant actors can be looked at separately, instead of taking the state as the sole and unitary actor. Just as President Trump has withdrawn from the Paris Agreement, cities, states and business in the United States have declared their ongoing commitment. Thus, all depends on the relevant actors. If those are individuals, actors of the executive branch in agencies or market participants, behavioral research can be readily applied.

Third, states act through individuals. The actions of elite decision makers, like treaty negotiators or heads of state can be attributed to the state and count as state behavior (as in Art. 7 VCLT). Behavioral insights have been applied to treaty negotiators and heads of state.

In sum: first, analyzing the state as a unitary actor and only inter-state relations does not capture the current reality of international law anymore. There are many more actors, including individual actors, on the scene. Careful precision on who is acting and under what conditions is required. Second, if we want to understand how states really behave, there is no special reason to exclude potential insights from behavioral science ex ante and not to explore whether behavioral insights might help our understanding of international law.

3. Factors Helping Enduring Cooperation

Collective action is the result of many factors in the lab experiments: it is important to capture them all for good legal design. The first important pillar of cooperation are internalized norms of cooperation, sustained by emotions such as guilt and shame; moral norms, such as fairness concerns are underlying those. The second pillar is the behavior of other people; here the principle of reciprocity comes to the fore. The third pillar is communication and building up trust. The fourth pillar remain sanctions meted out to anyone who does not cooperate.

A. Framing and Moral Judgments

43 See McDermott, Political Psychology in International Relations.
Framing effects were tested in public good games. A framing effect is assumed to be present “when different ways of describing the same choice problem change the choices that people make, even though the underlying information and choice options remain essentially the same.” In the psychological literature, framing effects are seen as a violation of the rationalist axiom known as “descriptive invariance”. Many experiments explore those effects. Ultimatum games, e.g., framed as resource dilemmas show higher offers and less rejections. Behavior is more cooperative when the situation is framed as an international negotiation than when it is framed as a business transaction. A prisoners’ dilemma game can also be framed as a trust game where cooperation is easier to achieve. It was shown that frames can influence beliefs and beliefs in turn influence motivation and thereby behavior. Law can thus act as a frame in two ways: it can enhance beliefs of what others do (legitimate expectations) and it can express a view on what is “the right thing to do”.

Framing can also activate moral sentiments. Rationalist game theory does not capture moral sentiments whereas behavioral game theory does without giving up the strategic interaction basis. Other-regarding motives have been shown to be a better predictor of behavior than those embodied in homo oeconomicus. Humans regularly show a culturally conditioned sense of fairness, and they are willing to enforce moral norms even at economic cost to themselves: “the real question is no longer whether many people have other-regarding preferences, but under which conditions these preferences have important economic and social effects.”

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47 Ellingsen and others, 'Social framing effects: Preferences or beliefs?'.
50 Although mostly collective action problems have been modelled as a prisoners’ dilemma game, ever more, it is accepted that those may also be viewed as mixed motive games, such as a trust game, Brian Skyrms, The Stag Hunt and the Evolution of Social Structure (Cambridge University Press 2004).
54 Gowdy, 'Behavioral economics and climate change policy', 633 with further references to experiments.
55 Fehr and Schmidt, 'The Economics of Fairness, Reciprocity and Altruism – Experimental Evidence and New Theories', 617.
anger and guilt are prototypical morally-linked emotions and are expected to be especially relevant in a context of social cooperation. In experiments, it was shown that free riding is perceived to be a moral problem. People think that it is morally blameworthy and more so the more others contributed; free-riding triggers anger by the cooperating individual. At the same time, free riding trigger feelings of guilt by the free rider – a feeling most people do not like, so called “guilt aversion”. Those emotions trigger two different potential enforcement mechanisms of norms – external and internal punishment. Potential free riders might expect punishment from the angry cooperative members and thus act cooperatively based on an extrinsic self-regarding incentive to avoid punishment. Guilt, in contrast, is a negative emotion that can serve as “internal punishment” and therefore provide an intrinsic reason for action. Cooperation can thus be supported to the extent that people think cooperating is morally the right thing to do and feel guilty if breaking the social contract. If actors are perceived as moral and legitimate, cooperation is fostered; if actors are deemed unfair, cooperation is undermined.

Three important mechanisms were identified: first, a known conditional form of altruism is the so-called inequality aversion describing a situation in which, in addition to the actor’s material self-interest, her utility increases if the allocation of material payoffs becomes more equitable. “Equitable” is of course an indeterminate notion and usually depends on the reference point; mostly the status quo. Other mechanisms are, secondly, social efficiency seeking (i.e. contributing to the public good) and thirdly, a desire to reward or punish intentions behind actions.

B. Reciprocity and Types of Actors

56 Gächter, 'Human Pro-Social Motivation and the Maintenance of Social Order', 37.
57 Ibid, 38.
59 See Gächter, 'Human Pro-Social Motivation and the Maintenance of Social Order', 38 et seq.
Reciprocity is an ambiguous term, being used by different disciplines in different ways.\textsuperscript{63} It has been recognized by social scientists\textsuperscript{64} as being one of the main basic principles that constitute societies. There is substantial evidence that human beings have developed the capacity – similar to that of learning a language – to learn reciprocity norms and general social rules that enhance returns from collective action.\textsuperscript{65} In its most extensive definition, based on self-interested rational actors, it consists of being favorable to others because others are favorable to you. Behavioral economics takes a more differentiated look at the reciprocity principle and uncovered different motivations. It identified three possible rationales, two of which are important here:\textsuperscript{66} (1) self-sustaining sequences of mutual favors which can be solely self-interested: “cooperative” or “retaliatory” behavior in repeated interactions is motivated by future benefits (explicable by rational choice, weak reciprocity); (2) balance (which assumes acts of comparison and matching), often related to equality and fairness concerns (reciprocity \textit{strictu sensu} or strong reciprocity).\textsuperscript{67} This matches what Keohane has called specific and diffuse reciprocity.\textsuperscript{68}

A reciprocal individual responds to actions he or she perceives to be kind in a kind manner, and to actions he or she perceives to be hostile in a hostile manner.\textsuperscript{69} Many people are strong negative reciprocators with punitive sentiments for wrongdoing.\textsuperscript{70} They are conditionally altruistic or spiteful: they are conditional cooperators, thus supporting the \textit{homo reciprocans} prediction over the \textit{homo oeconomicus} one.\textsuperscript{71} Experimental economists distinguish between the


\textsuperscript{66}Kolm, 'Reciprocity: Its Scope, Rationales, and Consequences'.

\textsuperscript{67}See, e.g. Gintis, 'Strong Reciprocity and Human Sociality' and Bowles and Gintis, \textit{A Cooperative Species: Human Reciprocity and Its Evolution}. 20.

\textsuperscript{68}Keohane, 'Reciprocity in International Relations', 4: specific reciprocity refers to “situations in which specified partners exchange items of equivalent value in a strictly delimited sequence. If any obligations exist, they are clearly specified in terms of rights and duties of particular actors. This is the typical meaning of reciprocity in economics and game theory. In situations characterized by diffuse reciprocity, by contrast, the definition of equivalence is less precise, one's partners may be viewed as a group rather than as particular actors, and the sequence of events is less narrowly bounded. Obligations are important. Diffuse reciprocity involves conforming to generally accepted standards of behavior.”

\textsuperscript{69}Armin Falk and Urs Fischbacher, 'A Theory of Reciprocity' (2006) 54 Games and Economic Behavior 293.

\textsuperscript{70}Surveyed in Simon Gächter and Benedikt Herrmann, 'Reciprocity, culture, and human cooperation: Previous insights and a new cross-cultural experiment' (2009) 364 Philosophical Transactions of the Royal Society B – Biological Sciences 791.

\textsuperscript{71}See Gary Charness and Peter Kuhn, 'Lab labor: What can labor economists learn from the lab?' in Orley Ashenfelter and David Card (eds), \textit{Handbook of Labor Economics} (Handbook of Labor Economics, Elsevier 2011) and overview of experiments supporting for strong positive reciprocity; the ultimatum game gives strong evidence
motivation (the reasons for action) and the behavior itself. Whereas some people indeed follow the assumption of rational-choice of maximizing their own, self-regarding behavior, others will behave selfishly under some conditions, but are not motivated by selfishness: “People can be non-selfishly motivated and end up behaving selfishly, but the converse also exists: selfish people behaving pro-socially.”

Although this holds for the majority, some people contribute nothing despite the fact they believe others will contribute a lot.

C. Communication and Trust

Many experiments and field studies have shown that face-to-face communication and knowing the other participants improves cooperative outcomes, in contrast to the “cheap talk” hypothesis of rational choice. As Ostrom holds: “the relationships among trust, conditional commitments, and a reputation for being trustworthy are key links in a second-generation theory of boundedly rational and moral behavior.” The reason assumed for why communication facilitates cooperation include (1) transferring information from those who can figure out an optimal strategy to those who do not fully understand what strategy would be optimal, (2) exchanging mutual commitment, (3) increasing trust and thus affecting expectations of others’ behavior, (4) adding additional values to the subjective payoff structure, (5) reinforcement of prior normative values, and (6) developing a group identity.

Trust increases with communication but depends on many factors, such as group identity and social capital and of course repeated interaction where reputation can be build. They also show how important the perceived (good) intentions of other actors are for interaction.

D. Sanctions

about strong negative reciprocity. See also Gächter, 'Human Pro-Social Motivation and the Maintenance of Social Order'.


Gächter, 'Human Pro-Social Motivation and the Maintenance of Social Order', 35, 42, 44.


Cheap talk is costless, non-binding pre-play communication in public good games. It has been used e.g. in Jack L. Goldsmith and Eric A. Posner The Limits of International Law (Oxford University Press 2005), 175 et seqq., 180 to show that international law in public good games is weak. In experiments, the “cheap talk” hypothesis has been shown to be wrong; the communication helps actors to achieve efficient results. See Gary Charness, Self-Serving Cheap Talk: A Test Of Aumann’s Conjecture’ (2000) 33 Games and Economic Behavior 177.


Ibid, 7.

Falk, Fehr and Fischbacher, 'Testing theories of fairness—Intentions matter'.

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Sanctions clearly remain necessary – also under behavioral assumptions. Sanctioning institutions are the “undisputed winner in a competition with a sanction-free institution”\(^79\) In CPR experiments\(^80\) it was also shown that the possibility to sanction alleviates the inefficient excess appropriation of the resource. Sanctioning is important to reinforce the other factors analyzed, e.g. in ensuring reciprocity via trust. Can cooperation survive without sanctions? The sobering answer of many public good experiments played around the world is that cooperation almost invariably breaks down in repeated interactions. But not all sanctions are alike. We will deal with the perceived fairness of sanctions (A.), decentralized sanctioning and outcasting (B.), as well as symbolic sanctioning (C.), all highly relevant for international environmental law which lacks strong material sanctions.

(1) Perceived Fairness of Sanctions

If sanctions are perceived to reveal selfish or greedy intentions, they destroy altruistic cooperation almost completely, whereas sanctions perceived as fair and legitimate leave altruism intact.\(^81\) Fair sanctions are especially those which sanction free-riders (defectors) in PG games. Sanctioning in experiments was conducted either by decentralized peer-sanctioning or by centralized, so called third-party punishment, where the potential punisher is not an affected party, but an independent third party. If decentralized sanctions are perceived as being unfair or just satisfying self-regarding motives, cooperation breaks down. Also, centralized punishment by only one group member has been studied and found quite effective.\(^82\) Since the third party is not affected by the decisions of the involved players, third-party punishment is a reflection of normative considerations.\(^83\) The results show that third parties are much more


\(^80\) See Armin Falk, Ernst Fehr and Urs Fischbacher, 'Appropriating the Commons - A Theoretical Explanation' in Thomas Dietz and others (eds), The Drama of the Commons (The Drama of the Commons, National Academy Press 2002) (finding that there is less appropriation in CPR and more contribution to public goods if the institutional set-up allows for (informal) sanctions and communication). For examples, see Ostrom, 'A Behavioral Approach to the Rational Choice Theory of Collective Action'. For the earliest experiments on CPRs, see Elinor Ostrom, Gardner Roy and James Walker, Rules, Games, & Common Pool Resources (University of Michigan Press 1994), 105 et seqq.

\(^81\) Bowles and Gintis, A Cooperative Species: Human Reciprocity and Its Evolution, 28.

\(^82\) Rick O'Gorman, Joseph Henrich and Mark Van Vugt, 'Constraining free riding in public goods games: Designated solitary punishers can sustain human cooperation' (2009) 276 Proceedings of the Royal Society B-Biological Sciences 323. This experiment shows that allowing a single individual to punish increases cooperation to the same level as allowing each group member to punish and results in greater group profits.

\(^83\) Ernst Fehr and Urs Fischbacher, 'Social norms and human cooperation' (2004) 8 TRENDS in Cognitive Sciences 185. They deem social norms prior to legal norms (p. 185): “Cooperation in human societies is mainly based on social norms, including in modern societies, where a considerable amount of cooperation is due to the legal enforcement of rules.”
likely to punish a defector if the other player cooperated than if both defected; this reflects the findings below on moral judgments.  

(2) Outcasting and the Formation of Club Goods

Many experiments use a peer-punishment design, using exclusion and the formation of club goods as sanctioning devices. This sort of punishment is cheaper than punishment where the punisher needs to take his own endowment to punish being costly for the punisher. The results are quite clear: cooperation is massively enhanced by those mechanisms. Adding the possibility of exclusion of a group to a game can be very effective at increasing contributions. It is critical that free-riders are not able to exploit cooperators on a long-term basis and thus they may well cooperate strategically, as it rapidly becomes apparent that contributing nothing will very likely lead to being excluded. The driving force appears to be the economies of scale of the larger group combined with the awareness that bad behavior will result in screening in the form of not being able to join a group or being expelled from one. Finally, the possibility of redemption (reversible exclusion) makes it possible to achieve a substantially higher degree of social efficiency, that is, contributions to the PG. The change from a PG to the formation of a club good thus fulfills two functions: on one hand it works as a mechanism to express one's affiliation to one's social group via in-group reciprocity; on the other hand, it can act as a punishment mechanism for out-group members who free-ride on the PG or the CPR. The experiments suggest that the possibility of exclusion, the formation of a club good and ostracizing are very effective mechanisms to uphold cooperation and contribution to a PG.

84 Matthew R. Ginther and others, 'Parsing the Behavioral and Brain Mechanisms of Third-Party Punishment' (2016) 36 Journal of Neuroscience 9420, holding that the evolved capacity for third-party punishment is considered crucial to the emergence and maintenance of elaborate human social organization and is central to the modern provision of fairness and justice within society.
85 Club goods are excludable and non-rivalrous in consumption. Seminal: James M. Buchanan, 'An Economic Theory of Clubs' (1965) 32 Economica 1.
88 Matthias Cinyabuguma, Talbot Page and Louis Putterman, 'Cooperation under the Threat of Expulsion in a Public Goods Experiment' (2005) 89 Journal of Public Economics 1421 (finding that contributions rose to nearly 100% of endowments with significantly higher efficiency compared with a no-expulsion baseline. Expulsions were strictly of the lowest contributors, and there was an exceptionally strong fall-off in contributions in the last period, when the expulsion threat was unavailable).
89 Charness and Yang, 'Public Goods Provision with Voting for Exclusion, Exit, and Mergers: An Experiment'.
(3) Symbolic Sanctioning

Even purely symbolic sanctioning is effective – good news for the international legal system. Symbolic sanctioning consists in pure dispraise or a statement of non-compliance. Symbolic sanctions work in the experiments as a driver of cooperation, contrary to rationalist assumptions. As has been shown in experiments, people are sensitive to the evaluation of others and symbolic sanctioning is more effective than expected; both, guilt and shame also play a role. People cooperate in social dilemma situations where sanctioning takes place by pure criticism and disapproval, rather than a reduced material payoff.91

III. Insights for International Law of GPGs and CRPs

The described factors are to a large extent already incorporated in international collective action treaties, but they draw our attention to their importance and show means for improvement. Due to space restrictions, for illustration, I will focus on climate change treaties (GPGs) and the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA),92 the first ever binding international treaty that focuses specifically on illicit fishing as a CPR. Insights can be applied to any other collective action treaty.

1. Framing and Moral Judgments

In their preamble, collective action treaties can frame an issue as a GPG or CPR problem to be solved. The Framework Convention on Climate Change93 and the Paris Agreement highlight that the problem to be solved is a PG problem by mentioning that “climate change is a common concern of humankind”, even if they do not use technical language. They also hint to the losses incurred if no action is taken, thus activating a bias called “loss aversion”.94 The UNFCCC talks about “adverse effects”; the Paris Agreement warns more forcefully about the “urgent threat of climate change.”95

91 Bowles and Gintis, A Cooperative Species: Human Reciprocity and Its Evolution, 29 et seq.
94 It refers to people's tendency to prefer avoiding losses to acquiring equivalent gains; see Amos Tversky and Daniel Kahneman, 'Loss Aversion in Riskless Choice: A Reference-Dependant Model' (1991) 107 Quarterly Journal of Economics 1039.
95 UNFCCC and Paris Agreement, Preambles.
Climate change treaties set fairness standards. Since the Kyoto Protocol, climate change law uses moral concepts in its language extensively. It raises equity concerns by taking a climate justice perspective that focuses on the fairness of the negotiated arrangement by clearly delineating the distribution of burdens and benefits, and by reference to those who are most vulnerable to global warming “on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty.” It clearly sets normative expectations especially for developed countries to mitigate climate change; the UNFCCC stressing in its preamble that they are the largest emitters of greenhouse gases. This “guilt factor” of the developed countries been transformed into obligations in the Kyoto Protocol by mandating that Annex I countries (the developed countries) mitigate their emissions.

The PSMA in contrast, does not describe overfishing as a CPR although it is one and thus does not make use of framing the participating states. It only stresses that developing countries need assistance in adopting and implementing port measures (Article 21). It also does not mention that overfishing leads to the loss of livelihood of some of the poorest people on earth, namely fishers in developing countries. It thus does not activate fairness and guilt emotions although experiments would suggest it should.

2. Reciprocity and Types of Actors

Reciprocity has also long been recognized by international lawyers as a main principle of international law. The mechanisms of reciprocity do not presuppose reciprocal treaties, but are also prevalent in collective action treaties, including in its strong form. International law and international relations theory has mostly relied on weak reciprocity following the rational choice unitary actor approach when analyzing cooperation in collective action constellations.

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97 Birnie, Boyle and Redgwell, International Law & the Environment, 596 et seq.
98 The “common but differentiated responsibilities” principle is also one of guiding principles of the UNFCCC (Art. 3.1).
99 See e.g. the Preamble of the Paris Agreement, UNFCCC, Decision 1/CP.21, ‘Adoption of the Paris Agreement’ (29 January 2016) UN Doc FCCC/CP/ 015/10/Add.1, Annex (Paris Agreement): “In pursuit of the objective of the Convention, and being guided by its principles, including the principle of equity and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances”; “Also recognizing the specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, as provided for in the Convention.”
100 Art. 4 (1) Paris Agreement.
But we might then overlook other reasons for sustaining international cooperation (especially if also non-state actors are included in the analysis which are of eminent importance in collective action constellations, e.g. cities, business and consumers). The attribution of intentions (and thus the “type”) is crucial in many areas of international law with decentralized sanctioning, just as in the experiments.

Ostrom et al. characterize different types of actors in CPR constellations, similar to those found in the experiments: “(u)users of a CPR include (i) those who always behave in a narrow, self-interested way and never cooperate in dilemma situations (free-riders); (ii) those who are unwilling to cooperate with others unless assured that they will not be exploited by free-riders; (iii) those who are willing to initiate reciprocal cooperation in the hopes that others will return their trust; and (iv) perhaps a few genuine altruists who always try to achieve higher returns for a group.”

Mitchell has a similar categorization for climate change actors characterizing states: committed, contingent, resistant and intransigent. If non-contribution to a multilateral treaty is not attributed to bad intentions but instead to technical problems, reactions of other states will be different and "kind." In contrast, if the defection is perceived as intentional as well as unfair and "unkind," stronger reactions are to be expected. The expectation is that if there are enough players “in” and there is a reasonable expectation that other states will comply, those actors that are conditional cooperators and willing to invest trust, will indeed cooperate, even if there are some resistant players.

International environmental law has mechanisms to validate beliefs about the intention and type of other actors by taking into account the intention of the non-compliant states and mandating different measures for different types. The Kyoto Protocol distinguishes between different causes of non-compliance in many instances and accounts for intentions and ability of the respective states to comply with norms.

The Preamble of the Paris Agreement relies on what behavioral economists would call a strong reciprocity argument, since, like in the Kyoto Protocol, obligations are differentiated. It contains a carefully calibrated mix of hard, soft and non-obligations. The boundaries between those are

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102 Ostrom and others, 'Revisiting the Commons: Local Lessons, Global Challenges', 279.
103 Ronald B. Mitchell, 'Flexibility, Compliance and Norm Development in the Climate Regime' in Jon Hovi, Olav Stokke and Geir Ulfstein (eds), Implementing the Climate Regime: International Compliance (Implementing the Climate Regime: International Compliance, Earthscan Press 2005), 77.
104 Aaken, 'Behavioral International Law and Economics', 474.
106 The Compliance Committee of the Protocol has two branches: a facilitative branch and an enforcement branch. The former aims to provide advice and assistance to Parties in order to promote compliance, whereas the enforcement branch has the responsibility to determine consequences for Parties not meeting their commitments.
blurred, sometimes being mixed together in one norm. “Soft” obligations can be found in the instruments in relation to mitigation, adaptation and means of implementation creating good faith expectations of other parties against which States will be judged.\textsuperscript{107} Although mitigation contributions are nationally determined (Nationally Determined Contributions; NDCs), those also create normative expectations that Parties will exercise a particular choice, but there is no requirement that they do so.\textsuperscript{108} Whereas rationalist approaches would dismiss this as irrelevant, solely by communicating their NDCs, benchmarks are set against which states will be judged by others. First, on the level of commitment (strong reciprocity and judgment of type) and second whether they adhere to it (weak reciprocity).

Beyond those normative expectations, there are others, like the progression over time and the “highest possible ambition”.\textsuperscript{109} The core of the Agreement are ‘hard obligations’ but only of conduct (not result) in mitigation and finance, in conjunction with a rigorous oversight system which consists mainly hitherto in creating monitoring bodies; the compliance mechanism of Article 15 of the Paris Agreement still must be developed.

The Kyoto Protocol allows all parties to raise questions of implementation with regard to any other party, thus allowing for a potential “punishment” by all states.\textsuperscript{110} Rational choice theories would predict that this would not happen since blaming of other countries carries a cost. But the system thus is not pessimistic concerning the second-order enforcement problem and is closer to what the experiments tell us – actors do punish even if costly to themselves in public good games. It remains to be seen whether the Paris Agreement makes use of this mechanism.

Can behavioral economics inform about the consequences of the withdrawal of the Paris Agreement by the United States? Does the drop-out of one, although important country, matter for the success of cooperation on climate change? Or will other countries stand firm(er) in their commitment? If other countries continue to reaffirm their commitment to the Paris Agreement, the one resistant country, even if big, does not matter for continuous cooperation. China and the EU immediately reaffirmed their commitment to the Agreement and even furthered their cooperation.\textsuperscript{111} Presumably, this will create enough confidence and trust for conditional


\textsuperscript{108} Art. 4 (4) Paris Agreement.

\textsuperscript{109} Each Party’s successive [NDC] will represent a progression beyond the Party’s then current [NDC] and reflect its highest possible level of ambition’ (Article 4.3).


cooperators for not unravelling the Agreement, also given that states, cities and business within the US will continue their efforts to abate climate change. Credibly reassuring all remaining partners of each other’s commitment is crucial, in contrast to rationalist insights, which would deem it “cheap talk”.

The PSMA does not make use of strong reciprocity; it relies on measures by single states on their own territory. It makes only more use than the climate change treaties of communication and trust building measures which enable to identify types and have other countries react accordingly. Those factors will be addressed in the following.

3. Communication and Trust

There is no doubt that international law fosters communication between the State Parties as well as non-state actors. Conferences of State Parties are just one example; the communication between and within the different bodies of the respective treaties is ongoing. By now, there are many specialized bodies established under the UNFCCC and following treaties. But the experiments show us that communication is indeed of utmost importance. Finding mechanisms to enhance more frequent communication would thus be desirable, e.g. via the creation of online fora or more frequent meetings of respective officials of the state parties.

In the Paris Agreement, the NDCs as well as the adaptation efforts are recorded in a public registry maintained by the secretariat, providing valuable context and offering mutual reassurances; thus, creating shared understandings and trust between the parties – which may induce those types of states which need trust in order to cooperate (conditional cooperators).

The legal commentator holding that “it is also an indispensable requirement to establish trust and confidence among parties. And trust, again, feeds back to increasing participation and ambition,” is confirmed by experiments.

Reporting, review and monitoring are important obligations in climate change agreements. Reliable information on the behavior of others is key for building trust. Article 13 of the Paris Agreement establishes a transparency framework, including on clarity and tracking of progress towards achieving Parties' NDCs of Article 4, Parties' adaptation actions under Article 7, including good practices, priorities, needs and gaps, to inform the global stocktaking under Article 14.

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112 Articles 4 (12) and 7 (12) Paris Agreement.
115 Art. 13 of the Paris Agreement.
Ever more, technology is helping to monitor behavior of state parties or private actors and thus enhances trust in the exchanged information, making it more reliable and credible. One prerequisite for upholding cooperation in collective action treaties is thus to use technology, like satellite information as much as possible as monitoring devices, e.g. in fisheries Agreements but also for climate change mitigation efforts. Nowadays, the movement of ships can be traced and can detect illegal fishing via satellites. Although the PSMA makes extensive use of electronic information exchange (Article 16), more institutionalized use of technology for reporting and monitoring would help foster cooperation. The Paris Agreement should also, under its yet to be developed compliance mechanism, make extensive use of all available technology for reporting and monitoring to enhance mutual trust.

4. Sanctions

As Chayes and Chayes as proponents of the managerial model have held: “Sanctioning authority is rarely granted by treaty, rarely used when granted, and likely to be ineffective when used.” that does not sound optimistic for international law in collective action constellations and has been criticized on various grounds. What is important here, is that they have a narrow view of sanctioning devices. The experiments show that other forms of sanctioning can also be important and that they are effective – and they are widely used in international law.

A. Perceived Fairness of Sanctions

International law sets the conditions under which sanctioning is legal – one may assume that this takes care of the “fair sanctions” problem and uses centralized sanctioning in Chapter VII UN Charter or treaty bodies or bilateral decentralized sanctioning via the VCLT (if treaty based) or bilaterally or multilaterally (Arts. 42, 48 and 49 ARSIWA). Several treaty bodies in climate change treaties can be seen as being third-party punishers, even if not being a court. They make sure that the treaty body is perceived as neutral and/or as having special (scientific)

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117 E.g. Downs, Rocke and Barsoom, ‘Is the Good News about Compliance Good News about Cooperation?’
118 Chayes and Handler Chayes, The New Sovereignty: compliance with international regulatory agreements., 30: treaty based sanctions (military or economic), membership sanctions and unilateral sanctions (coercion).
expertise.\textsuperscript{120} The UNFCCC, the Kyoto Protocol and the Marrakesh Accords\textsuperscript{121} adopting the compliance mechanism for the Kyoto Protocol as foreseen its Article 18, use those bodies and Article 15 of the Paris Agreement also foresees expert bodies.

The Kyoto Protocol established the most elaborate compliance regime ever developed under an international environmental agreement.\textsuperscript{122} It is the first regime that combines facilitative and enforcement-oriented features by creating a Compliance Committee, consisting of the Facilitative and an Enforcement Branch, thus accounting for the reasons of non-compliance. Monitoring, reporting, review processes and verification are at the forefront as compliance facilitation mechanisms. When states seem unlikely to comply, the regime has adopted a system to avoid confrontation, to be transparent and to eschew hard sanctions in favor of cooperative measures, especially through the Facilitative Branch, including advice, financial and technical assistance and capacity building;\textsuperscript{123} the Paris Agreement seems to go the same way (Article 15). The Enforcement Branch which only works for the so-called Annex I countries can indicate “consequences” for non-compliance,\textsuperscript{124} cast not as punitive but as providing for “the restoration of compliance to ensure environmental integrity” and “for an incentive to comply.”\textsuperscript{125} The Kyoto Protocol „Procedures and Mechanisms on Compliance” contain several safeguards to ensure due process and thus render the sanctions viewed as fair\textsuperscript{126} – an important element in the experiments and the field to uphold collective action in order to give credibility and

\textsuperscript{120} Art. 8.3 Kyoto Protocol tasks the expert review teams only with the identification of questions of implementation not the determination of parties’ compliance, let alone non-compliance, with their commitments: As held by Brunnée, ‘The Kyoto Protocol: A Testing Ground for Compliance Theories?’, 272: “This mandate is designed to preserve the technical and factual focus of expert review and to clearly separate it from potentially sensitive and politicized compliance issues.”


\textsuperscript{123} Mitchell, ‘Flexibility, Compliance and Norm Development in the Climate Regime’. 73 et seq.

\textsuperscript{124} Those differ depending on the underlying commitment. In cases of non-compliance with inventory or reporting commitments, consequences will consist in a declaration of non-compliance and in the requirement that the party concerned prepare a “compliance action plan” (Procedures and Mechanisms, XV.1). If a party has not met one or more of the eligibility requirements for the Kyoto mechanisms, the consequence will be suspension of the party from participation in the mechanisms (Procedures and Mechanisms, XV.4). For further examples, see Brunnée, ‘The Kyoto Protocol: A Testing Ground for Compliance Theories?’, 247.

\textsuperscript{125} Procedures and Mechanisms, V.6.

\textsuperscript{126} The decision structure is complicated and its description would exceed the space limit here. But, for example, Procedures and Mechanisms, XI.4. permits an appeal to the meeting of the parties if the affected party “believes it has been denied due process”.

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legitimacy.\textsuperscript{127} Notably, Parties were found to have fully complied in the first commitment period (without any actual recourse to sanctions).\textsuperscript{128}

**B. Outcasting and the Formation of Club Goods**

Outcasting is an important, but neglected enforcement mechanism in international legal theory.\textsuperscript{129} It is often used in international law, especially treaties dealing with GPGs and CPRs. It uses exclusion, ostracism and the formation of club goods as punishments for non-cooperative states, indeed exclusion is said to be the main enforcement mechanism.\textsuperscript{130} It involves denying the non-compliant State the benefits of social cooperation and membership as well as the use of markets. This works not only on the inter-state level but enforcement can also be external by third parties, including subnational entities and non-state actors.\textsuperscript{131} It is effectively used on the inter-state level by Article 4 of the Montreal Protocol\textsuperscript{132} banning the import of the controlled substances listed in the Annexes with non-Parties. Markets and non-state actors are effectively used e.g. in GPG constellations like combating terrorism financing and money laundering (Financial Action Task Force; FATF) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora.\textsuperscript{133} In all cases, states or private actors involved in the market are shut out of the market if they are either not a state party or do not fulfil the norm requirements. Outcasting only works with a normative benchmark (soft law, as in FATF or hard law as in CITES) which provokes justified reactions by other actors so that sanctions are seen as fair and sanctioning actors feel provoked to sanction.

Also in climate change law this mechanism is used. Through the Marrakesh Accords, Parties are prevented from using the flexibility of the Kyoto Mechanisms\textsuperscript{134} unless they are compliant with the mechanisms specific requirements and more general methodological and reporting

\textsuperscript{127} For a detailed analysis of the Kyoto Compliance system, see Ulfstein and Werksman, 'The Kyoto Compliance System: Towards Hard Enforcement'.

\textsuperscript{128} Igor Shishlov, Romain Morel and Valentin Bellassen, 'Compliance of the Parties to the Kyoto Protocol in the First Commitment Period' (2016) 16 Climate Policy 768.

\textsuperscript{129} Oana A. Hathaway and Scott Shapiro, 'Outcasting: Enforcement in Domestic and International Law' (2011) 212 Yale Law Journal 252.

\textsuperscript{130} Ibid.

\textsuperscript{131} See for details, Aaken, 'Trust, Verify or Incentivize? Effectuating Public International Law Regulating Public Goods Through Market Mechanisms'.

\textsuperscript{132} Montreal Protocol on Substances that Deplete the Ozone Layer, 16 September 1987, 1522 U.N.T.S. 29 [Montreal Protocol].

\textsuperscript{133} March 3rd, 1973, 993 U.N.T.S. 243 [CITES]. Art. III, IV and V regulate the trade in endangered species differently depending on the how endangered the species is. Without import and export certificates, no trade can take place.

\textsuperscript{134} Through the Kyoto mechanisms, which include joint implementation (Article 6), the clean development mechanism (Article 12), international emissions trading (Article 17), and, arguably, joint fulfillment (Article 4), parties can transfer or acquire emission entitlements or reduction credits respectively.
requirements. They are thus shut out of the market if non-compliant. The Paris Agreement hitherto is not using those mechanisms but States would be highly advised to use them when negotiating the details of compliance procedures under Article 15. Although there are no obligations of result, at least the obligations of conduct can be sanctioned this way.

The PSMA aims to prevent illegally caught fish from entering international markets through ports. Under the terms of the treaty, foreign vessels will provide advance notice and request permission for port entry, countries will conduct regular inspections in accordance with universal minimum standards, offending vessels will be denied use of port or certain port services and information sharing networks will be created. Again here, the outcasting mechanism is used, although for private actors. One could imagine that States which repeatedly do not comply with the Agreement could be in toto shut out of the market.

C. Symbolic Sanctioning

The method of symbolic sanctioning is widely used in environmental treaties, as a shaming device. There is no reason to exclude heads of state of those sentiments or states as a whole for that matter. Indeed, one core contribution of virtually all non-compliance mechanisms in environmental treaties is that they generate and publicize findings of non-compliance without ‘harder’ sanctions, the so-called “sunshine method” or sanctioning via “shaming”. The mechanisms of the Kyoto Protocol as described above as well as of the Paris Agreement which rely on monitoring bodies whose assessments are published can be seen as a valid form of sanctioning once it is recognized that sanctioning includes a statement that a norm has been violated (even if not by a court or with any material consequences). According to rule 9 of the Rules of Procedure of the Compliance Committee of the Kyoto Protocol “meetings of the plenary and the branches shall be held in public. In the Paris Agreement, symbolic sanctioning via transparency is the only sanctioning mechanism. This must have design consequences for the facilitation and compliance mechanism in Article 15 of the Paris Agreement which has yet to be spelled out and focus on transparency, monitoring using all available technology and public statements.

The PSMA uses reporting and sharing information on fishing extensively. It remains less clear how this information will be shared with non-Parties and how the general compliance of states

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135 For details, see Wang and Wiser, 'The Implementation and Compliance Regimes under the Climate Change Convention and its Kyoto Protocol', 190 et seq.
136 Articles 9 and 16.2. PSMA.
137 Edith Brown Weiss, 'Strengthening Compliance with Climate Change Commitments' in Holger P. Hestermeyer and others (eds), Coexistence, Cooperation and Solidarity (2 vols) (Coexistence, Cooperation and Solidarity (2 vols), Brill 2011), 699.
138 Ibid, 700.
will be assessed. It should make utmost efforts to communicate this information widely in order to have the symbolic sanctioning mechanism play its role if the PSMA is not implemented correctly.

IV. Conclusion

Using behavioral insights opens up the possibility to base theories about international cooperation generally and on GPG and CPRs specifically on a micro-level analysis of behavior which is empirically validated. Those insights paint a more optimistic picture of the possibility of solving international social dilemmas then rationalist approaches do. This article refrains to take a Panglossian view on those – material interests and strategic interaction remain important. But it adds new insights on which factors help in sustained cooperation which should not been neglected.

Behavioral insights also have the potential to bridge the gap between rationalist and constructivist theories of international law. Although behavioral economics has a rationalist starting point, it hints at insights which were long proposed by constructivist scholars and thus opens opportunities for dialogue with constructivists.\textsuperscript{139} Constructivists have long questioned the rationalist account on how preferences are formed, proposing an alternative model that emphasizes the social nature of preferences and processes of socialization.\textsuperscript{140} For constructivist scholars framing – although not referring to the psychological experiments – has always played a role.\textsuperscript{141} The role of communication and the creation of trust building institutions has been emphasized just as the effectiveness of symbolic and fair sanctioning by independent third parties has been assumed. Still, even if the behavioral research confirms assumption of the constructivist school, it still matters to have it empirically validated by behavioral insights. New insights added by experimental research are the role of strong reciprocity and conditional cooperation.

There are some caveats: the experimental research is relatively young. The set-up of the experiments are still too rough to answer many open questions in international law which is so much more nuanced and complex. More research is needed, including more tailor-made experiments. Nevertheless, it already has generated many insights which have the potential to

\textsuperscript{139} As here, Hafner-Burton and others, 'The Behavioral Revolution and International Relations', S3.
\textsuperscript{140} For a comparison between rationalist and constructivist approaches, see James Fearon and Alexander Wendt, 'Rationalism v. Constructivism: A Skeptical View' in Walter Carlsnaes, Thomas Risse and Beth A. Simmons (eds), \textit{Handbook of International Relations} (Handbook of International Relations, Sage 2002).
enrich our understanding of GPG and CPRs. This article is a first attempt to outline the behavioral insights on GPGs and CPRs on the international plane. Leaving those insights out for the analysis and the legal design on international law dealing with the most pressing issues of humankind, might be an omission which we may come to regret.