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Sustainable cooperation needs tinkering with both rules and social motivation

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1 “Coping with potential tragedies of the commons is never easy and never fin-
2 ished.” Elinor Ostrom (2005, p. 286)

3 The tragedy of the commons seems to be in large part a tragedy of cooperative systems
4 that are taken over by the outside (Klooster 2000). The paradigmatic case is irrigation
5 systems, for which there is overwhelming evidence that the farmer-managed systems
6 (FMIS) outperform the (government)agency-managed systems (AMIS) on virtually
7 all counts (Lam 1996; Ostrom, this issue). Cooperation is more effective and sustain-
8 able among the former compared to the latter. Dealing with this insight has changed
9 institutional analysis in important ways and continues to exert pressure to adapt the
10 behavioral theories to be able to cope with the intricacies of sustainable cooperation
11 (see for example Anderies et al. 2011; Lindenberg and Foss 2011). Rules of the game
12 are normally taken to constitute the game, so that if we want to study the dynamics of
13 the game, we take the rules as given. More recently, it has also become more common
14 to assume that there are fixed types of actors (for example, there are socially motivated
15 conditional cooperators and there are rational egotists). When studying the informal
16 level of interaction for what has been called “joint production” of a collective good
17 (Lindenberg and Foss 2011), such as the governance of a smaller-scale common pool
18 resource, but also the workings of teams in organizations), it is important to recog-
19 nize that adapting the rules (and, as I will argue below, continuously influencing the
20 social motivation) is part of such informal games. Changing circumstances require
21 rather constant adaptation and fine-tuning of the rules. It is of great consequence to

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22 include this possibility of what Ostrom (this issue) calls “tinkering” with rules in the
23 analysis, and she showed this convincingly for informal rules that govern irrigation
24 (Ostrom, this issue). It also means that for informal production of collective goods to
25 be effective and sustainable, there must be little interference in the tinkering, i.e. there
26 must be leeway to keep adapting all aspects of the informal cooperation, save those
27 that contradict rules of polycentrically higher levels of governance.

28 **1 Why is tinkering so important?**

29 Ostrom’s answer to this question is that there are internal and external factors to which
30 rules have to be adapted in order to function. Such factors are often not stable and
31 thus the group of people that is affected by the functioning of the rules has to be able
32 to “tinker” with rules, by adapting them, changing them, adapt the group to which
33 the rules apply etc. As an external change, Ostrom gives the example of a group
34 of farmers that set up an irrigation system where they share the water equally. One
35 farmer now sells his land and the new owner changes to a crop that requires more
36 water than he is allotted, and he might take the extra water at night or take a longer
37 turn than is allowed. This is likely to lead to conflict and the group of farmers has to
38 deal with this situation by coming together and adapt the allocation rule or change
39 some other rule. If the new owner is a very powerful person, they may not dare to
40 challenge him and rather agree to give him a higher allotment. The efficacy of the
41 rules can be affected by many different external changes. In the example of irrigation
42 rules, changes in the climate, or sudden storms may affect the water demand and/or
43 supply to such a degree that the rules have to be adapted. But there also could be
44 economic changes, such as waning labor supply because people are being lured by
45 higher wages to other places; or, conversely, new labor being drawn to the region.
46 Also, there could be policy changes from a higher government that require adaptation
47 of the rules. Ostrom’s best work in recent times is related to the varying impact of
48 such external factors on informal rules concerning local joint production (including
49 sharing arrangements) and how they have been dealt with. This cannot be said about the
50 internal factors that require tinkering with rules and the motivation to follow them with
51 intelligent effort. Internal factors relate for example to drawing the boundaries of the
52 group of appropriators, to what motivation the appropriators have to follow the rules
53 and to monitor others, to the sanctions for not following the rules, to the leadership
54 of the system, etc. These internal factors are covered in her “design principles that
55 characterized robust common-property institutions” (Ostrom 2005, p. 259). However,
56 with regard to these internal factors, Ostrom uses a very rough brush that misses too
57 much detail to be on a par with her analysis of external factors. Even though she argues
58 for not taking rules a fixed, she does rely much on the idea that there are fixed types of
59 players (Ostrom 2000). She thereby also pays little attention to the fact that types are
60 also made by the circumstances and also need tinkering. In the literature, we often find a
61 “double standard” approach: assuming fixed actor types, but also assuming crowding
62 in/out effects and changeable types, with evolutionary arguments for both. Ostrom
63 even quotes Camerer as saying that “institutional arrangements can be understood as
64 responding to a world in which there are some sociopaths and some saints, but mostly
65 regular folks who are capable of both kinds of behavior” (Ostrom 2005, p. 125). This

66 argues against using fixed types (even though there are these types) and this double
67 standard stands in the way of dealing with the important issue of tinkering with social
68 motivation, not just rules. Whether or not somebody is a conditional cooperator or
69 a rational egoist, is to a large degree a matter of the environment in which he or
70 she operates (Lindenberg 2012). Tinkering with this environment can thus make the
71 difference between successful and unsuccessful cooperation. In the remainder of this
72 contribution, I will discuss, why we need to pay close attention also to the internal
73 factors, and how we can begin to analyze their workings in a systematic fashion.

74 **2 Internal factors and the motivational basis for joint production**

75 Ostrom (this issue) mentions that there can be some memory loss concerning what was
76 agreed, there can be some ignorance of rules and, as a result of either of both, rules may
77 change “simply by nonenforcement and the withering away of what had been agreed
78 upon earlier”. There can also be misunderstandings about the meaning of rules, for
79 “they are just words”. In this case, it is likely that there develops conflict concerning
80 the interpretation of rules. If there are regularized procedures for hearing conflicts and
81 for coming up with “legitimate” solutions, then people will settle on new or adapted
82 rules. This is about it regarding her analysis of internal factors. There is no analysis of
83 what is meant by “legitimacy” or the lack thereof, or the possibility that the basis for
84 giving legitimacy to rules may change. In Ostrom (2005), she explicitly says that “by
85 creating rules that are seen as legitimate, rule conformance will tend to be higher” (p.
86 282), but why and how seems to remain outside her analysis with one exception. In
87 the formal models (Ostrom 2005, p.121), she introduces the normative aspects as a
88 “delta parameter” indicating intrinsic rewards for following norms (with no assumed
89 impact on cognitive processes). However, in the verbal descriptions (Ostrom 2005,
90 p. 112f, 126, 146f, passim), she uses the idea that prescriptions that are covered by
91 “shared common understandings” concerning their “deontic” nature mobilize different
92 categories of thinking about the act and different kinds of incentives (including guilt
93 and shame) than prescriptions that are covered by shared understandings about prudent,
94 rational action. “Deontic” denotes being related to the normative domain (of what
95 is forbidden, obligated, or permitted), rather than to what is efficient, prudent, or
96 profitable. Examples she gives are norms of reciprocity and norms concerning trust.
97 Other rules are presumably made deontic by being legitimate. But how is deonticness
98 maintained? Are there internal factors that may threaten it? Does it need “tinkering”
99 as well? How does “deontic” relate to a behavioral theory? Even though she explicitly
100 states that “explanations of human behavior in social dilemma situations... must use
101 a broader theory of boundedly rational, potentially norm-using, individual behavior”
102 (Ostrom, this issue), she does not specify such a theory. It is in this regard, that her
103 work can profit from closer consideration of what “potentially norm-using” would
104 mean in terms of a behavioral theory rather than behavioral types.

105 **3 Norms and overarching goals**

106 The most direct way to link “potentially norm-using” to a behavioral theory is to take
107 the architecture of the mind into consideration, which is governed by the dynamics of

108 goals (Kruglanski et al. 2002) and especially overarching goals (mind sets), rather than
109 by preferences. Such overarching goals, when activated, selectively activate certain
110 preferences; direct one's attention; activate selected parts of one's knowledge system;
111 influence what one likes and dislikes at that moment, and what one expects others to
112 do; determine which goal-criteria are important. Three such overarching goals have
113 been distinguished in the literature (Lindenberg and Steg 2007). There is the *hedonic*
114 *goal*, linked to improving the way one feels right now. For example, when the hedonic
115 goal is focal (i.e. dominant), then exerting effort is clearly experienced as a burden,
116 as this goal is only related to the way one feels, not to group goals or gain in the
117 future. There is the *gain goal*, linked to the focus on improving one's resources (thus
118 oriented towards the longer term). For example, when the gain goal is focal, one
119 pays much attention to cost/benefit aspects of alternatives, and plans courses of action
120 that are expected to lead to advantageous outcomes. Finally, there is the *normative*
121 *goal* that is linked to a feeling of obligation to act appropriately. For example, if the
122 normative goal is focal, then the orientation is towards the realization of group goals
123 and conformity to group norms (as the codification of ways to reach group goals).
124 It is, of course, possible that the group norms are not consistent among each other
125 or with other ethical standards the individual holds. To the degree that this happens,
126 the normative goal will be weakened in favor of one of the other two overarching
127 goals. This process had already been described in detail by the classical sociologist
128 Durkheim (see Lindenberg 1975). Normative consistency itself needs tinkering.

129 To some degree all three overarching goals are chronically activated, but their rel-
130 ative strength varies depending on situational circumstances. For example, observing
131 clear (dis)respect for norms from others, (weakens)/strengthens one's own normative
132 goal (Keizer et al. 2008, 2013; Lindenberg 2012). Importantly, goals that are activated
133 but not so strong as to be dominant, can affect the strength of the focal goal positively
134 and/or negatively from the cognitive background. A positive influence can occur for
135 particular subgoals. For example, if one also expects to gain money (a subgoal of the
136 gain goal) by following group norms, the normative goal may be strengthened. This
137 influence of overarching goals from the cognitive background needs careful calibra-
138 tion (itself an issue for tinkering) because it can backfire in the sense that money can
139 become so important that the gain goal displaces the normative goal to become dom-
140 inant. In that case, even though norm conformity is compatible with certain aspects
141 of gain, the situation is restructured from focal attention to appropriateness to focal
142 attention to costs and benefits. This increases the weight given to cost/benefit aspects
143 and changes the alternatives one pays attention to. Then one is particularly sensitive
144 to cues about the opportunities for gain and relatively insensitive to cues about what
145 behavior is appropriate in terms of group goals and norms.

146 With regard to the overarching goals themselves (rather than specific subgoals),
147 however, it is more likely that, from the cognitive background, they weaken the focal
148 goal, rather than strengthen it, because they are in conflict with the latter. For exam-
149 ple, keeping to norms may create direct monetary costs that are likely to weaken the
150 dominance of the normative goal the more, the greater the costs are, making "norma-
151 tive slippage" more likely. The sensitivity to relative prices differs for different focal
152 overarching goals, but does not vanish altogether in any configuration (Lindenberg
153 and Frey 1993). These effects of goals in the cognitive background are graduated

154 because an overarching goal can be more or less dominant (focal). To the degree that
155 it is dominant, people are sensitive to goal relevant aspects and relatively insensitive
156 goal-irrelevant aspect. Thus, the more dominant the normative goal, the more peo-
157 ple are sensitive to information (or cues) about what action is appropriate, to what is
158 forbidden, allowed, obligated (what Ostrom referred to as “deontic”); and to signs of
159 social disapproval. Conversely, people’s sensitivity to the cost of effort and money is
160 lowered in proportion to the dominance of their normative goal. What does all this
161 imply for informal cooperation for joint production?

162 4 What needs tinkering and why

163 For informal collective action, it is quite essential that the normative goal is dominant
164 in situations that relate to the production and maintenance of the collective good, and
165 that individuals are willing to exert intelligent effort for the joint project. This com-
166 bination has been called “joint production motivation” (Lindenberg and Foss 2011).
167 Tinkering with regard to this motivation does not mean that one tries various possibil-
168 ities until finding the solution that is optimal. Rather it means a constant willingness
169 to respond to context with intelligent effort, to use a case by case approach, if need be,
170 to persuade, arm-twist, negotiate, bring together, complain, adapt and show flexibility,
171 all in the service of the collective good(s). Routinization with “best practices” are
172 likely to undermine rather than help sustainable informal cooperation on the longer
173 run. Because hedonic and gain goals compete with the normative goal for dominance,
174 and make it decay unless it is continuously supported, the crucial question is: what
175 strengthens the normative goal in situations of informal collective action sufficiently
176 to drive (conflicting) hedonic and gain goals into the background and what creates the
177 willingness to follow norms with one’s own intelligent effort towards the realization
178 of the common goal? And why does it need continuous tinkering?

179 4.1 Group

180 The first important factor derives from the fact that norms codify group goals. Thus,
181 for them to become focal, there must be a *recognized ingroup* of people that can be
182 connected to a common goal. There must be a clear idea who belongs and who does
183 not. Ostrom (2005, p. 259ff) realizes this and made it the first “design principle” for a
184 governance system of common pool resources. But she overlooked the great amount
185 of tinkering connected to group formation. Creating such a group is no trivial require-
186 ment. Often, this group is not the “community” (see Nunan 2006) but a collection of
187 stakeholders, some with questionable claims, some possibly with preexisting rights
188 that may run counter to sharing, etc. Creating and maintaining such a group is likely to
189 take tinkering to various degrees and for various periods with the aim of bringing about
190 some sort of “collective identity” (Abers 2007). For example, it is not just a matter of
191 choosing technically the “right” boundaries (for example for deciding where the tail
192 end of the irrigation chain is), but also choosing people who are likely to be able to
193 contribute to the maintenance of the system in terms of labor, materials, and funds and
194 who perceive the common goal as well as the necessity that everybody puts in his or
195 her contribution. For instance, in irrigation projects, small leaks at the head end may

196 have compound negative effects further down and need to be repaired even though the
197 individual farmer has little to gain from putting in the effort and material necessary
198 to do it. The ability to contribute may vary even over shorter periods of time and
199 individuals have to be able to credibly signal their commitment to the ongoing project,
200 even when they fall behind obligations. Such signaling ability requires common sym-
201 bolic understandings and at least partial suspension of mistrust by others (Lindenberg
202 1998). Being integrated in such a group has been shown to increase cooperativeness
203 (Cavalcanti et al. 2013). The group does not have to be homogeneous (Varughese and
204 Ostrom 2001), but the interdependence should be more or less evenly distributed in
205 order to create a group identity (White and Runge 1995). Outside interference that
206 reduces tinkering with group building, is likely to make things worse. For example,
207 the radical solution of reducing the interdependence by technical means through out-
208 side agents, may have perverse effects if it reduces interdependence only for some
209 and not for all. As a case in point, Lam (1996) describes how government technical
210 interference by building permanent headworks for diverting the water of an irrigation
211 systems increased the asymmetry between headenders and tailenders so much that it
212 became very difficult for them to remain one group for joint governance. Freed from
213 maintaining the headworks, headenders did not need the cooperation of the tailenders
214 anymore, while tailenders could not fend for themselves. Overall performance is likely
215 to decline as a result.

216 4.2 Feasibility beliefs

217 Next to the formation and maintenance of the group, and related to it, is the strength-
218 ening of the normative goal within the group. This goal is likely to be displaced by one
219 of the other two overarching goals, unless it gets extra support. One of the strongest
220 supports is the belief that, with regard to the project, others also have a dominant nor-
221 mative goal. Conditional cooperation can in fact be seen as a graduated effect of cues
222 about others' dominant goal (Lindenberg 2012; Keizer et al. 2013), rather than as a per-
223 sonality trait. In the context of joint production projects, probably the most important
224 support is the belief in the *feasibility of the project*, implying that members are fairly
225 confident that others in the group will contribute and that on the longer run everybody
226 stands to gain. It is thus not so much the size of one's own gain that counts, but the
227 belief that everybody in the group will gain (since that makes continued participation
228 of others more likely). There is some evidence for this claim in the field of informal
229 cooperation projects. For example, White and Runge (1995), studying 22 watersheds in
230 Haiti found that for landholder participation, "the ratio of gain for all landholders was
231 significant, not the ratio of gain for each participating landholder." (p. 1689). Similarly,
232 for organizational commitment, Mühlau and Lindenberg (2003) found that it varies
233 positively with the wage level of the company rather than the individual wage level.

234 4.2.1 Successful experience with cooperation

235 On the basis of what has been said so far, we can identify a number of factors that
236 influence feasibility beliefs. Next to everybody gaining, an important factor is prior

237 successful experience with cooperation, such as labor exchange or other kinds of coop-
238 eration. Experience with conflict lowers feasibility beliefs (Antinori and Bray 2005;
239 Agrawal and Chhatre 2006), whereas experience of prior cooperation helps activation
240 of norms of cooperation; it allows anticipation of others' reactions to situations of
241 joint production (for example concerning reciprocity); it increases trust; and it creates
242 a basis for ongoing face-to-face communication to sustain the belief in feasibility (Lam
243 1996; Prediger et al. 2011; Meinzen-Dick et al. 2002). Such ongoing communication
244 allows members to access direct cues of the likelihood that others will remain in the
245 project (Andersson 2004; Ostrom 2005) and its importance has also been underlined
246 by recent common pool experiments (Ahn et al. 2010; Anderies et al. 2011). It may be
247 supported by common face-to-face rituals "that help solidify individual beliefs about
248 the trustworthiness of others" (Ostrom 2005, p. 261).

249 4.2.2 Monitoring

250 Another important factor is monitoring. Ostrom (this issue) clearly recognizes its
251 importance. Without monitoring there are no sanctions, and without sanctions, partic-
252 ipants will more likely break the rules, and thereby "the rules-in-use may deteriorate to
253 just rules-in-form." However, given the framework just outlined, there are other func-
254 tions of monitoring that may be even more important than the anticipation of sanctions
255 by the individual farmer. Monitoring feeds directly into feasibility beliefs. Knowing
256 that there is monitoring, participants (a) have a higher expectation that cheaters will
257 be discovered and dealt with, and (b) expect a higher degree of fairness of the system
258 if they consider the rules as fair. In turn, the chance that the rules are fair is higher if
259 the participants also participated in the rule making (Ostrom 2005, p. 263). Feelings
260 of unfairness strengthen the hedonic goal (with feelings of anger and disappointment)
261 and thereby lower the strength of the normative goal. Monitoring thus has a triple
262 function (for own behavior, for beliefs that others are kept in line, and for beliefs in
263 fairness of the system) and as such may be one of the major pillars of sustaining coop-
264 eration. Yet, the level of monitoring differs a great deal across self-governing groups
265 (Gibson et al. 2005).

266 Why is monitoring not applied everywhere, if it is so essential for success? One
267 important reason is likely to be that successful monitoring is a very complex process
268 that actually requires a great deal of tinkering. It is difficult to calibrate and to avoid
269 perverse effects. First of all, if it is interpreted as sheer act of control, monitoring
270 is likely to lower, rather than heighten the strength of the normative goal (Frey and
271 Jegen 2001; Falk and Kosfeld 2006). This fact alone stacks the cards against moni-
272 tors who act on behalf of outside agencies. In order not to be interpreted as coming
273 from the outside, monitoring must be clearly part of the collective goal achievement,
274 which, in turn, depends on the existence of a group in the sense described above.
275 Thus monitoring and the other elements that feed into feasibility beliefs influence
276 each other. For good functioning, this requires that the monitor is accepted as part of
277 the joint endeavor and shows inside knowledge and intelligent effort (even if hired
278 by the group rather than member of the group). Part of this process is the ability to
279 negotiate what is counted as transgression and what is not. Another part is the ability to
280 distinguish mishaps from deliberate transgression, which requires credible signaling

(as mentioned above). Sanctions must be graduated accordingly because sanctions that are perceived as disproportionate are likely to lead to acts of revenge and to discrediting of the monitor (increasing the relative weight of the hedonic goal). To be proportional, the monitor must know much about the specific circumstances, because he often combines the role of police and judge. For this reason, graduated sanctions might even be case-specific, depending on the particular resources and socioecological circumstances involved. In case of conflict, a group meeting may resolve the issue. In larger societies, this tinkering role is more likely played by judges. To be successful, the monitor must also not be willing to settle for side-payments in lieu of sanctions. Because monitors in informal joint production groups are either not paid at all or receive rather little compensation, this too requires a dominant normative rather than gain goal and hence embedding in the group. If bribes are accepted, the monitoring process loses its triple functions listed above.

4.2.3 Leadership

For all factors that influence the feasibility beliefs, effective leadership is a considerable facilitator. It has long been recognized in the organizational literature, that there are different leadership types and that transformational leaders can inspire and motivate others to see their common goal and to jointly go after realizing it. Such a leader is a prototypical tinkerer in that he or she flexibly considers the advantages of jointness, and the changing contexts rather than rigidly enforcing rules (Bass 1990; Witt 1998; Cleavenger and Munyon 2013). Even though such leaders are not a precondition for successful informal joint production, such leaders (based on local authority structures) can be highly effective in forging collective identities, convincing potential members of the gain for everybody, lowering threshold for face-to face communication, helping resolve conflicts, boosting members' willingness to monitor intelligently, and actually bridging the two kinds of tinkering: the creation and maintenance of feasibility beliefs and rule change. To my knowledge, in the common-pool literature, there is not yet much attention to this form of leadership, probably because of the informal aspect of such a role. However, in Ostrom's and related work on common-pool resources there is much attention to the detrimental effects of *wrong leadership*, namely leadership imposed from the outside. It blocks tinkering almost completely, because outside leaders are likely to choose rules that are easy to administer and thus to go for one-size-fits-all (what Ostrom 2005, p. 274ff calls "blueprint thinking"), undermine local initiative, drive out a normative orientation in favor of a gain orientation, with the danger of corruption, fail to monitor properly and intelligently, and lack the necessary local knowledge to adapt flexibly to changing circumstances.

5 Conclusion

Ostrom's work has thoroughly changed institutional analysis by showing that we should not take rules of the game as fixed but make tinkering with rules part of the analysis. She also gives many examples in which there is tinkering with the motivation for joint production, but she does not incorporate this kind of tinkering in a systematic

way, in part because she uses distribution of given types (cooperative/rational egoists etc.) as a background assumption. This distracts her from the fact that types (mind sets) are also made by the circumstances, which, in turn, requires tinkering with the circumstances. The microfoundations for dealing with “joint production” should be extended to cover such effects. Once we do this, it becomes very plausible that, for a common project, there must be a group with some group identity and there must be a fairly strong belief in the feasibility of the project among the group members. Both group formation and feasibility beliefs derive from factors that take much and continuous tinkering.

For different resources and socioecological parameters, the amount of tinkering in order to achieve these two preconditions differs. For example, it is clear from the analysis that not individual gain but the gain assumed to accrue to all in the group is a crucial variable. The larger that kind of gain (for example the distance to a market, see [Rustagi et al. 2010](#)), the less prior “collective identity” there has to be. Common pool resources may be more or less well delineated or predictable, making these gain expectations also more or less certain ([Prediger et al. 2011](#)). If the collective good is something like flood management rather than a common pool resource, it gets even more uncertain what the gain for everybody will be; and for such collective goods as caring for wild-life it becomes highly improbable that strong feasibility beliefs can emerge. In such cases, tinkering alone may not be enough and co-production ([Ostrom 1996](#)) with outside agents may become a viable option. But there is the danger that outside support (even if constructive) is not continuous, and initiatives and ongoing projects are likely to wither away when outside support ends, as many community projects have shown. A detailed account of such a process can be found in [Frieling et al. \(2012\)](#).

Finally, the analysis also allows us to throw some light on the question of actor “types”. Overarching goals shift with changing circumstances. Because the group context influences the dominance of the normative goal, there are more people who function as “conditional cooperators” in successful groups than in unsuccessful groups. In unsuccessful groups, the normative goal is not dominant. If we were to take a sample from each group and play public good games, it would look like tinkering had nothing to do with it, that it was all a matter of the distribution of conditionally cooperative types in the population ([Rustagi et al. 2010](#)). Rather than assuming fixed types, for institutional analysis it seems more fruitful to enlarge the scope of attention to tinkering, not just with rules, but also with the precarious motivation to contribute to the production of a collective good.

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Revised Proof