Organizational structure, communication and group ethics

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Appendices

NOT TO BE PUBLISHED

Contents

Appendix A.1: INSTRUCTIONS (Horizontal Consensus Treatment)

General Information: Welcome! You are about to participate in a social science experiment. Each of you received the same instruction sheet.

Group: Each of you belongs to a group of three participants. No participant knows the identity of the two other members of his/her group.

Roles: At the outset of the experiment, each participant is identified by a letter (A, B or C) when s/he is randomly assigned to a computer terminal. Each group consists of a participant A, a participant B and a participant C. Participants A and B can either agree to adopt a plan numbered 0 to 10 or quit the experiment. C participants have no decision to take.

<u>Participants A and B</u> have a 600 seconds delay (10 minutes) to reach an agreement on the plan to adopt. For this to happen, each participant A and B must make a plan proposal by clicking the plan's number in the bottom row of the computer screen, and by validating the choice made. As soon as a participant (A or B) has validated his/her choice, the other participant (B or A) will be informed that a decision has been taken, but s/he will not be informed about the content of this decision. For the proposal to be displayed on the subjects' screens, both participants must have submitted and validated their respective proposals.

To each plan corresponds:
1.   a gain which is the same for participants A and B,
2.   a gain for participant C which may represent a loss (a negative gain).

Participants A, B and C know the gains associated to each plan.

▪   If the plan proposals are not identical, there is no agreement between participant A and B and each can submit a new proposal.

▪   If the proposals are identical, an agreement is possible. Each participant can then either confirm that an agreement has been reached by clicking the "Confirm" button, or reject the agreement by clicking the "Cancel" button.
o   If both A and B choose "Confirm", then the proposed plan is adopted and the corresponding gains are distributed to participants A, B and C. The experiment is then finished.
o   If A or B chooses to reject the agreement, then both can then submit a new plan proposal.

At any time during the 600 seconds of play, each participant (A or B) can quit the experiment either by clicking the "Quit" button, or by clicking the "Stop the experiment and quit". In either case, the experiment stops and the gains are equal to zero for the three participants A, B and C. The computer displays the proposal of participant A in dark blue and that of participant B in dark red. The next-to-last proposals of A and B appear light blue and light red, respectively.

The experiment continues as long as the 600 seconds time delay has not been reached or as long as no participant chooses to quit. If no agreement has been reached within this time delay, the experiments ends and the gains of the three participants A, B and C are equal to zero.

At any time during the experiment, the time left to agree on a plan is displayed in the upper left corner of the computer screen. The count-down starts as soon as the first propositions of A and B are displayed on their respective computer screens.

Participant C has no decision to take and does not know the proposals made participants A and B. S/he is only asked to answer the questions that appear on his/her computer screen. Answering these questions has no effect on gains or on the experiment's results.

Communication *(only in treatment « with Communication »)***:** Participants A and B can choose to verbally communicate through an electronic mail system. To do so, one has to write a message in the appropriate space and send it. Each participant A and B can shut the electronic mail system down, and each participant can re-open it after having shut it down. When the electronic mail system is shut down, participants A and B cannot communicate.

You are not allowed to use the electronic mail system to send insulting messages, or messages that identify you (name, surname or nickname) or which help to identify you (age, ethnic origin, religion, profession, etc.).

Total Gain: The gains associated to each plan are expressed in Euros (€). At the outset of the experiment, each of you will receive a capital balance of 7 Euros. Your total reward from this experiment will be equal to 7 Euros plus the gain made in this experiment or to 7 Euros minus the loss made in this experiment.

Questionnaire: Before starting the experiment, and once assigned to a computer terminal, we will ask you to answer a questionnaire about these instructions. Answering this questionnaire does not interfere with the experiment.

If you have a question, ask one of the administrators in the laboratory, not another participant. In this experiment, you are not allowed to communicate with the other participants.

QUESTIONNAIRE (Horizontal Consensus Treatment)

(only displayed on subjects' screens)

1. Among the participants to this experiment, there only are participants A and B.
   Answer: *Wrong. There are as many participants C as there are participants A (and B).*

2. In each group of three participants, participant A can only propose a plan to participant B.
   Answer: *Wrong. Participant A can either propose a plan numbered 0 to 10 or « quit » the experiment.*

3. If participants A and B propose the same plan, then this plan will be adopted only if both confirm their agreement.
   Answer: *Right.*

4. Participant A or B may choose to quit the experiment at anytime s/he wishes.
   Answer: *Right.*

5. If participants A and B did not reach an agreement for a plan within the allotted time, then the plan implemented by default is the last plan proposed by A.
   Answer: *Wrong. If participants A and B did not reach an agreement within the allotted time, then the plan implemented by default is "Quit".*

6. Participant A or B may propose the same plan several times in a row.
   Answer: *Right.*

7. If participant A or B chooses to quit the experiment, by choosing the « Quit » option, then the adopted plan is « Quit ».
   Answer: *Right.*

8. If participant A or B chooses to quit, then participants A, B and C get zero profits.
   Answer: *Right.*

9. For a given plan, participants A, B and C always make the same profit.
   Answer: *Wrong. For a given plan, Participants A and B make the same profit. Participant C makes either a gain or a loss (a negative gain).*

10. Your total gain from this experiment is equal to your €7 capital minus the gains realized during the experiment.
    Answer: *Wrong. Your total gain from this experiment is equal to your €7 capital plus the gains realized during the experiment or to your €7 capital minus the losses realized during the experiment.*

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7*. Only participants A and B can communicate via an electronic mail system.
   Answer: *Right.*   [$H_{co}wC$ treatment]

Appendix A.2: INSTRUCTIONS (Vertical Treatment)

General Information: Welcome! You are about to participate in a social science experiment. Each of you received the same instruction sheet.

Group: Each of you belongs to a group of three participants. No participant knows the identity of the two other members of his/her group.

Roles: At the outset of the experiment, each participant is identified by a letter (A, B or C) when s/he is randomly assigned to a computer terminal. Each group consists of a participant A, a participant B and a participant C.

Participant A has two options. S/he can:

1)   Propose participant B to adopt a plan numbered 0 to 10 by clicking the plan's number in the bottom row of the computer screen, and by validating the choice made.
    To each plan corresponds:
•   a gain which is the same for participants A and B,
•   a gain for participant C which may represent a loss (a negative gain).

Or

2)   Quit the experiment by clicking the "Quit" button and by validating the choice made. In this case, the experiment ends and the gains are equal to zero for the three participants A, B and C.

Participant B has two options. S/he can:

1)   Accept the plan proposed by participant A by clicking the "Accept" button. In this case, the plan is implemented, the experiment ends and the corresponding gains are distributed to participants A, B and C.

Or

2)   Quit the experiment by clicking the "Quit" button and by validating the choice made. In this case, the experiment ends and the gains are equal to zero for the three participants A, B and C.

Participant C has no decision to take and does not know the proposals made participants A and B. S/he is only asked to answer the questions that appear on his/her computer screen. Answering these questions has no effect on gains or on the experiment's results.

Participants A, B and C know the gains associated to each plan.

Communication *(only in treatment « with Communication »)***:** Participants A and B can choose to verbally communicate through an electronic mail system. To do so, one has to write a message in the appropriate space and send it. Each participant A and B can shut the electronic mail system down, and each participant can re-open it after having shut it down. When the electronic mail system is shut down, participants A and B cannot communicate.

You are not allowed to use the electronic mail system to send insulting messages, or messages that identify you (name, surname or nickname) or which help to identify you (age, ethnic origin, religion, profession, etc.).

Total Gain: The gains associated to each plan are expressed in Euros (€). At the outset of the experiment, each of you will receive a capital balance of 7 Euros. Your total reward from this experiment will be equal to 7 Euros plus the gain made in this experiment or to 7 Euros minus the loss made in this experiment.

Questionnaire: Before starting the experiment, and once assigned to a computer terminal, we will ask you to answer a questionnaire about these instructions. Answering this questionnaire does not interfere with the experiment.

If you have a question, ask one of the administrators in the laboratory, not another participant. In this experiment, you are not allowed to communicate with the other participants.

QUESTIONNAIRE (Vertical treatment)

(only displayed on subjects' screens)

1. Among the participants to this experiment, there only are participants A and B.
   Answer: *Wrong. There are as many participants C as there are participants A (and B).*

2. In each group of three participants, participant A can only propose a plan to participant B.
   Answer: *Wrong. Participant A can either propose a plan numbered 0 to 10 or « quit » the experiment.*

3. Participant B may reject A's proposal by choosing the "quit" option.
   Answer: *Right.*

4. Participant C may reject A's proposal by choosing the « quit » option.
   Answer: *Wrong. Only participant B can reject A's plan.*

5. If participant B chooses to quit, then the plan adopted by default is plan 0.
   Answer: *Wrong. If participant B chooses to quit, then no plan is implemented and the game ends.*

6. If participant B accepts A's proposal, then this plan proposal will be implemented.
   Answer: *Right.*

7. If participant A chooses the « Quit » option, then the adopted plan is « Quit ».
   Answer: *Right.*

8. If participant A or B chooses to quit, then participants A, B and C get zero profits.
   Answer: *Right.*

9. For a given plan, participants A, B and C always make the same profit.
   Answer: *Wrong. For a given plan, Participants A and B make the same profit. Participant C makes either a gain or a loss (a negative gain).*

10. Your total gain from this experiment is equal to your €7 capital minus the gains realized during the experiment.
    ***Answer:** Wrong. Your total gain from this experiment is equal to your €7 capital plus the gains realized during the experiment or to your €7 capital minus the losses realized during the experiment.*

_____

7*. Only participants A and B can communicate via an electronic mail system.
   Answer: *Right.* [VwC treatment]

Appendix A.3: INSTRUCTIONS (Horizontal Average Treatment)

General Information: Welcome! You are about to participate in a social science experiment. Each of you received the same instruction sheet.

Group: Each of you belongs to a group of three participants. No participant knows the identity of the two other members of his/her group.

Roles: At the outset of the experiment, each participant is identified by a letter (A, B or C) when s/he is randomly assigned to a computer terminal. Each group consists of a participant A, a participant B and a participant C. Participants A and B can either propose a plan numbered 0 to 10 or quit the experiment. C participants have no decision to take.

Participants A and B have a 600 seconds delay (10 minutes) to make a plan proposal by clicking the plan's number in the bottom row of the computer screen, and by validating the choice made.

To each plan corresponds:
3.   a gain which is the same for participants A and B,
4.   a gain for participant C which may represent a loss (a negative gain).

Participants A, B and C know the gains associated to each plan.

During the 600 seconds of play, each participant (A or B) can quit the experiment by clicking the "Quit" button. In this case, the experiment stops and the gains are equal to zero for the three participants A, B and C.

If none of the participants chooses to Quit, and as soon as participants A and B validated their choice, the gains of A, B and C are displayed on subjects' monitors; these gains are equal to the average of the gains (or losses) associated to A and B's chosen plans.

Each of participants A and B then can either:

- Accept this distribution of gains by clicking the « Accept » button,
Or
- Refuse this distribution of gains by clicking the « Quit » button.

If both A and B accept, then participants A and B each receive the average of the gains associated to their proposals, and participant C receives the average of the gains (or losses) associated to these plans. The experiment is then finished.

If either A or B quits, then the gains are equal to zero for the three participants A, B and C. The experiment is then finished.

If either A or B has not made a proposal or has not decided whether to accept or not the proposed distribution of gains within the 600 seconds, then the experiments ends and the gains of participants A, B and C are equal to zero. A count-down will display on A and B's monitor screens the remaining time.

Participant C has no decision to take and does not know the proposals made by participants A and B. S/he is only asked to answer the questions that appear on his/her computer screen. Answering these questions has no effect on gains or on the experiment's results.

Communication *(only in treatment « with Communication »)*: Participants A and B can choose to verbally communicate through an electronic mail system. To do so, one has to write a message in the appropriate space and send it. Each participant A and B can shut the electronic mail system down, and each participant can re-open it after having shut it down. When the electronic mail system is shut down, participants A and B cannot communicate.

You are not allowed to use the electronic mail system to send insulting messages, or messages that identify you (name, surname or nickname) or which help to identify you (age, ethnic origin, religion, profession, etc.).

Total Gain: The gains associated to each plan are expressed in Euros (€). At the outset of the experiment, each of you will receive a capital balance of 7 Euros. Your total reward from this experiment will be equal to 7 Euros plus the gain made in this experiment or to 7 Euros minus the loss made in this experiment.

Questionnaire: Before starting the experiment, and once assigned to a computer terminal, we will ask you to answer a questionnaire about these instructions. Answering this questionnaire does not interfere with the experiment.

If you have a question, ask one of the administrators in the laboratory, not another participant. In this experiment, you are not allowed to communicate with the other participants.

QUESTIONNAIRE (Horizontal Average Treatment)

(only displayed on subjects' screens)

1. Among the participants to this experiment, there only are participants A and B.
   Answer: *Wrong. There are as many participants C as there are participants A (and B).*

2. In each group of three participants, participant A can only propose a plan to participant B.
   Answer: *Wrong. Participant A can either propose a plan numbered 0 to 10 or « Quit » the experiment.*

3. If participants A and B propose plans with numbers between 0 and 10, then they will each receive the average of the gains associated to these plans only if they both accept this distribution of gains.
   Answer: *Right.*

4. Participant A or B may choose to quit the experiment at anytime s/he wishes.
   Answer: *Right.*

5. If participant A or B has either not made a plan proposal or not accepted the distribution of gains within the allotted time, then the plan adopted by default is the plan proposed by A.
   Answer: *Wrong. If participant A or B has not made a proposal nor taken a decision within the allotted time, then the plan implemented by default is "Quit".*

6. Participant A or B may propose the same plan several times in a row.
   Answer: *Wrong. Participant A or B can make only one plan proposal.*

7. If participant A chooses the « Quit » option, then the adopted plan is « Quit ».
   Answer: *Right.*

8. If participant A or B chooses to quit, then participants A, B and C get zero profits.
   Answer: *Right.*

9. For a given plan, participants A, B and C always make the same profit.
   Answer: *Wrong. For a given plan, Participants A and B make the same profit. Participant C makes either a gain or a loss (a negative gain).*

10. Your total gain from this experiment is equal to your €7 capital minus the gains realized during the experiment.
    Answer: *Wrong. Your total gain from this experiment is equal to your €7 capital plus the gains realized during the experiment or to your €7 capital minus the losses realized during the experiment.*

7*. Only participants A and B can communicate via an electronic mail system.
   Answer: *Right.*   [$H_{av}wC$ treatment]

Appendix B.1: Screenshots (H_{co} and $H_{co}wC$)

FormCoopPlayer A

Temps restant
577 s

Vous êtes le participant A

Tableau des gains : — Décision de B

Plan	Quitter	0	1	2	3	4	5	6	7	8	9	10
Votre Gain	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de B	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de C	0	-6	-4,8	-3,6	-2,4	-1,2	0	1,2	1,2	1,2	1,2	1,2

Décision de B

| Quitter | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Légendes : — Actuelle — Précédente

Votre décision

| Quitter | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Légendes : — Actuelle — Précédente

Veuillez choisir votre décision en cliquant sur l'un des boutons, puis validez votre choix en cliquant sur le bouton 'valider'

Valider

FormCoopPlayer A

Temps restant
422 s

Vous êtes le participant A

Tableau des gains : — Décision de B

Plan	Quitter	0	1	2	3	4	5	6	7	8	9	10
Votre Gain	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de B	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de C	0	-6	-4,8	-3,6	-2,4	-1,2	0	1,2	1,2	1,2	1,2	1,2

Légendes : — Actuelle — Précédente **Décision de B**

| Quitter | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Légendes : — Actuelle — Précédente **Votre décision**

| Quitter | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Veuillez choisir votre décision en cliquant sur l'un des boutons, puis validez votre choix en cliquant sur le bouton 'valider'

Valider

Fermer la messagerie

Vous pouvez envoyer des messages à B

-B: >Bonjour
-A: >Bonjour
-A: >Ok pour le plan 2?
-B: >je prefere le plan 4 ou le 5

Votre message | et plan 3 ? | **Envoyer**

Tapez votre message dans la case blanche ci-dessus et cliquez sur 'envoyer' pour l'envoyer

Appendix B.2: Screenshots (H$_{av}$ and H$_{av}$wC)

ScreenHAV

Tableau des gains

Plan	Quitter	0	1	2	3	4	5	6	7	8	9	10
Votre Gain	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de B	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de C	0	-6	-4,8	-3,6	-2,4	-1,2	0	1,2	1,2	1,2	1,2	1,2

Votre décision

Vous êtes le participant A

| Quitter | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Veuillez choisir votre plan en cliquant sur l'un des boutons, puis validez votre choix en cliquant sur le bouton 'valider'

Valider

ScreenHAVWC

Tableau des gains

Plan	Quitter	0	1	2	3	4	5	6	7	8	9	10
Votre Gain	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de B	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de C	0	-6	-4,8	-3,6	-2,4	-1,2	0	1,2	1,2	1,2	1,2	1,2

Votre décision

Vous êtes le participant A

| Quitter | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Veuillez choisir votre plan en cliquant sur l'un des boutons, puis validez votre choix en cliquant sur le bouton 'valider'

Valider

Fermer la messagerie

Vous ne pouvez pas envoyer de messages car B a fermé sa messagerie

Votre message | **Envoyer**

Tapez votre message dans la case blanche ci-dessus et cliquez sur 'envoyer' pour l'envoyer

Appendix B.3: Screenshots (V and VwC)

FormHPlayerProp A

Tableau des gains

Plan	Quitter	0	1	2	3	4	5	6	7	8	9	10
Votre Gain	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de B	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de C	0	-6	-4,8	-3,6	-2,4	-1,2	0	1,2	1,2	1,2	1,2	1,2

Votre décision

Vous êtes le participant A

| Quitter | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Veuillez choisir votre plan en cliquant sur l'un des boutons, puis validez votre choix en cliquant sur le bouton 'valider'

Valider

FormHPlayerProp A

Tableau des gains

Plan	Quitter	0	1	2	3	4	5	6	7	8	9	10
Votre Gain	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de B	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de C	0	-6	-4,8	-3,6	-2,4	-1,2	0	1,2	1,2	1,2	1,2	1,2

Vous êtes le participant A

Votre décision

| Quitter | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Veuillez choisir votre plan en cliquant sur l'un des boutons, puis validez votre choix en cliquant sur le bouton 'valider'

Valider

Fermer la messagerie

Vous pouvez envoyer des messages à B

```
-A: >Bonjour !
-B: >Bonjour !
-A: >Je propose le plan 0, ok?
-B: >Je ne suis pas d'accord
-A: >Et le plan 2?
```

Votre message [   ] **Envoyer**

Tapez votre message dans la case blanche ci-dessus et cliquez sur 'envoyer' pour l'envoyer

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Appendix C: Consequentialist preference approaches and example with responsibility-alleviation

Even when expanded to allow for altruism or to capture fairness concerns, simple game-theoretic models do not provide straightforward predictions of how the process for decision-making should affect ethical outcomes. As shown above (Conjecture 0), preference heterogeneity is vital for any effects to exist. Here, we study the possibility of threats and signaling within the above impure utilitarian model; by consequentialism, $r=1$ and w^A and w^B are independent of structure and communication. Notice that for $y \le 7$, $w = \beta/1-\beta$ captures Ernst Fehr and Klaus Schmidt's (1999) model of fairness with β as the aversion to self-advantageous inequality and $\beta > 1/2$ implies $w > 1$.[1]

Recall that each actor's preferred outcome as a function of w is $y(w) = 6.I_{\{w>5/12\}}$ where I is a 0/1 indicator function; so A and B's preferences conflict when their altruism parameters (w^A, w^B) lie on either side of 5/12. In a vertical firm, A makes a take-it-or-leave-it proposal to B that maximizes A's utility given A's beliefs about B's preference parameter w^B.[2] In a horizontal firm, there are many equilibria, but the following class of equilibria always exist and are attractively simple: A and B coordinate on a protocol in which, at random, either A or B makes a take-it-or-leave-it proposal to the other.[3] The resulting equilibria replicate the equilibria in the vertical treatments, except that A and B's roles may be reversed. Given the random assignment of roles and treatments, this implies a common distribution of payoff outcomes for V and H_{co} and for VwC and H_{co}wC. This reinforces Conjecture 0, but the equilibrium assumption is implausibly strong; for instance, preference signaling is likely in H_{co} and impossible in V. Nonetheless, predicting a specific treatment effect requires strong distributional and equilibrium assumptions.

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[1] In our simple setting the related models of Gary Bolton and Axel Ockenfels (2000), Gary Charness and Matthew Rabin (2002), and James Cox, Daniel Friedman, and Steve Gjerstad (2007) generate similar predictions.

[2] A may raise y above $y(w^A)$ to reduce expected quits. B prefers to acquiesce (not quit) if $y \ge \underline{y}(w^B)$ where $\underline{y}(w^B) = 20(6w^B - 5)/(12w^B - 5)$. If A knew B's preference type, A would set $y = \text{Max}\left\{y(w^A), \underline{y}(w^B)\right\}$. (For $w^B < 5/6$, $\underline{y}(w^B) < 0$ so A faces no credible threat of a quit.)

[3] A first round proposal game can serve to coordinate which insider has the take-it-or-leave-it power. As noted by a referee, consistent with this take-it-or-leave-it idea, many decisions in our data do end up implementing one of the two insider's initial proposals.

Predicting the impact of communication also requires strong assumptions, but we can offer an **example where cheap-talk has a negative impact on vertical structures**:

Suppose that for all subjects and hence for A and B (independently), $w = 1$ with probability p and $w = 0$ with probability $1 - p$. In V and VwC, if $w^A = 1$, then $y = 6$ since B can never pressure A to reduce y. Now restrict attention to the contingency with $w^A = 0$. First, suppose p is low ($p < 1/5$). In V, A sets $y = 0$. In VwC, A would set $y = 0$ if B types pool. The low type subordinate (B with $w^B = 0$) cannot gain from any deviation, so it is "self-signaling" for the high type (B with $w^B = 1$) to threaten to quit since $y = 0 < \underline{y}(1) = 10/7$. Our setting permits "rich-language" communication (see Joseph Farrell and Matthew Rabin 1996), so we predict the separating equilibrium in which A (restricted to integer values) sets $y = 2$ when B's type is high and $y = 0$ otherwise. The average y is then higher in VwC than in V, but in V, the high type B ends up quitting, so C's average payoff is actually lower in VwC.[4] Second, suppose p is high ($p > 1/5$). A with $w^A = 0$ sets $y = 2$ in V (where pooling is unavoidable). In VwC, a self-signaling separation message, now from the low type subordinate, lowers y from 2 to 0. There are no quits, so C's average payoff is again lower in VwC relative to V. In sum, for this example, communication makes vertical firms behave less sociably.

The opposite effect is possible in the more extreme case where the high type has $w > 5/4$. It is still true that when p is high, communication hurts C; type separation reduces the need for an unkind boss A to set a precautionary kind strategy. However, when p is low, the unkind boss is not cautious and separation of kind subordinates with $w > 5/4$ leads to outcomes with $y > 5$ which are kinder to C than the above quits. So VwC is kinder than V in this admittedly extreme case.

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[4] C's average payoff (for A with $w^A = 0$) is $(1 - p)(-6) + p(-3.6)$ in VwC and $(1 - p)(-6) + p(0)$ in V; insider foregone payoffs are also lower in VwC than V (conditional averages are p and $5p$, respectively).

Responsibility-alleviation: an example where C is worse off in V than in H$_{co}$

Suppose $w = 0$ or 1 with equal probability ½ (for all actors) and suppose perceived responsibilities $r^B(V) = 0$, $r^B(H_{co}) = r^A(H_{co}) = 0.9$, $r^A(V) = 1$. Consider the equilibrium of H$_{co}$ in which one of A and B (probability ½ for each) makes a take-it-or-leave-it proposal to the other. If initial interactions allow A and B to signal their types (see above), the average value of y is $\bar{y} =$ ½(6) + ¼(2+0) = 3.5, because $y = 6$ when the proposer has $w = 1$ (probability ½), $y = 2$ when the proposer has $w = 0$ and the responder has $w = 1$ (probability ¼) and $y = 0$ if both proposer and responder have $w = 0$ (probability ¼). In the (less plausible) case of a pooling equilibrium, $\bar{y} =$ ½(6) + ½(2) = 4, because a proposer with $w = 0$ sets $y = 2$ when uninformed about the responder's type. By contrast in V, when $w^A = 0$, A sets $y = 0$ (rather than $y = 2$) even if A knows $w^B = 1$, since B does not feel responsible in V ($r^B = 0$ implies $w^B.r^B = 0$). So the expected outcome in V is lower at $\bar{y} = 3$ (=½(6)) and C is worse off (there are no quits).

Voice-as-involvement: two examples where C is better off in VwC than in V

The first is as close as possible to the responsibility-alleviation example just above. The second demonstrates the important effect of categorical ethics.

1) Using the parameter constellation of the previous example, but adding $r^A(VwC) = 1$ and substituting $r^B(VwC) = 0.9$ in place of the assumption for H$_{co}$, provides a simple example of voice-as-involvement. The equilibrium derivation is very similar. In V, the average value of y is 3, exactly as above. In the pooling equilibrium of VwC, A sets $y = 6$ when $w^A = 1$ but when $w^A = 0$, A now sets $y = 2$ as a precaution against the (probability 0.5) risk that $w^B = 1$. So the average of y, $\bar{y} = 4$. In the separating equilibrium of VwC (the most plausible by the reasoning on previous page), $y = 6$ when $w^A = 1$, $y = 0$ when $w^A = w^B = 0$ and $y = 2$ when $w^A = 0$ and $w^B = 1$. So on average, $\bar{y} = 3.5$. Either way, C is better off in VwC than in V.

2) Suppose that a fraction q of actors obey the rule "do not participate in a project that does harm if able to exert some influence on the level of harm". For concreteness, we suppose these ethical actors are utilitarian, preferring to set $y = 6$, while other actors are self-interested. We can represent the ethical types as actors with $w = \frac{1}{2}$ for whom $r = 1$ if the rule applies and $r = 0$ if not; in particular, in the subordinate role, they have $r^B = 0$ in V but $r^B = 1$ in VwC. So in V, $y = 6$ with probability q and otherwise $y = 0$. In the separating equilibrium of VwC, $y = 6$ with probability q, $y = 5$ with probability $q(1-q)$ and $y = 0$ with probability $(1-q)^2$. Clearly, C's average payoff is then higher in VwC than in V. In the (less plausible) pooling equilibrium of VwC, C's average payoff is either the same as in the separating equilibrium (for $q < \frac{1}{2}$, the $y = 5$ outcome is replaced by a quit) or it is even higher (by $6(1-q)^2$ for $q \geq \frac{1}{2}$, as $y = 5$ substitutes the $y = 0$ outcome). Either way, C is better off in VwC than in V.

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Appendix D: Analysis in terms of *Harmful* vs. *Harmless* plans

We report here on another measure of 'kindness' to C which simply distinguishes *harmful* outcomes (plans with $y < 5$, corresponding to foregone payoffs < 2.5 in Figure 2) from *harmless* outcomes ($y \geq 5$ or non-production, denoted "Quit", i.e., foregone payoffs ≥ 2.5). The table below reports the frequencies of *harmful* and *harmless* plans and the outcomes of two-tailed binomial tests that check if in a given treatment *harmful* and *harmless* plans are equally likely or not.

Treatment	Harmful	Harmless	Binomial test (*p*-value)
H_{co}	17	3	.0026
H_{av}	17	3	.0026
V	16	4	.0118
$H_{co}wC$	18	2	.0004
$H_{av}wC$	14	6	.1153
VwC	11	9	.8238

Conjecture / Observation 0: Two-tailed binomial tests reject the null hypothesis that *harmful* and *harmless* outcomes are equally likely in H_{co}, H_{av}, V and $H_{co}wC$ (*p*-values $\leq .012$) but do not reject in $H_{av}wC$ ($p = .115$) nor in VwC ($p = .824$). Two-tailed Fisher 2×2 exact tests find a significant difference in the likelihoods of observing *harmful* and *harmless* plans between VwC and H_{co} and between VwC and H_{av} (both *p*-values = .082).

Conjecture / Observation 1: One-tailed binomial tests reject the null that *harmful* and *harmless* outcomes are equally likely in favor of the alternative that they are more likely to be *harmful* in V ($p = .006$). This is not the case for VwC ($p = .412$). Also plans are more likely to be *harmful* in V than in VwC according to a one-tailed 2×2 Fisher exact test ($p = .088$).

Conjecture / Observation 2: One-tailed binomial tests reject the null of equivalence in favor of the alternative that plans are more likely to be harmful in H_{co}, H_{av} and V ($p = .001$, $p = .001$ and $p = .006$, respectively). One-tailed Fisher 2x2 exact tests do not pick up the predicted differences since we cannot reject the null of equal likelihoods between H_{co} and H_{av} nor between H_{av} and V (both *p*-values = 1.000). We attribute this to the fact that H_{av} leads to a centrally concentrated

distribution and the middle values, foregoing 1.5 and 2, still involve harm, so they are lumped with the least kind plan 0, foregoing 0.

Conjecture / Observation 4: One-tailed binomial tests reject the null that *harmful* and *harmless* outcomes are equally likely in favor of the alternative that they are more likely to be *harmful* in $H_{co}wC$ ($p = .0002$). This is not the case for VwC ($p = .412$). A one-tailed Fisher 2×2 exact test confirms that $H_{co}wC$ is significantly more likely than VwC to generate *harmful* outcomes (both *p*-values = .015).

Appendix E.1: Literal transcripts of Chat log files in $H_{co}wC$

Group id and chat data	Foregone Payoff [Plan #] (# rounds)
$H_{co}wC$, Group 1: -A: >should it be a plan such that the payoffs are the same for all? -A: >or the one that makes us earn most? -B: >doesn't matter if he earns less -A: >so we choose plan 0 -A: >or 2 as you've put ? -B: >i think so too, even if that's not very nice for him -A: >we choose 0 then? -B: >yes -A: >ok	**0** **[Plan 0]** **(2 rounds)**
$H_{co}wC$, Group 2 (no communication)	**0** **[Plan 0]** **(1 round)**
$H_{co}wC$, Group 3: -B: >if I have 5 and you 5, we earn 5 euros? -B: >? -B: >0 -B: >are you there -A: >yes but that's not nice for the person 'cause he came as we did -B: >so we can do this -A: >what -B: >5 euros each and we divide the gains in three -B: >that's better than 2 2 and 1.2 -B: >3.3! -A: >yes but we don't know who is C -B: >in any case he cannot decide -A: >that's true -B: >he has the choice between -6 and 1.2 -B: >1.2 is not much! -B: >instead of having 1.2, he'll have 0 -B: >so are you ok with this -A: >no he won't have 0, he'll have 6 instead of the starting 7 -B: >it's better than 0 -B: >you don't know him at all -B: >and if it happens that you know him -B: >then we divide in three -A: >i don't know -B: >there are 280 seconds left -B: >5 each -A: >5 minutes -B: >:) -A: >it's a matter of conscience -B: >and too bad for him that he chose to be C -A: >poor him, he hasn't chosen -B: >destiny -B: >which makes that we are here -B: >5 is better than 2 no [Continued Overleaf]	**0** **[Plan 0]** **(2 rounds)**

-B: >ok -A: >what a difference!!! lol [= lots of laughs] -B: >3 euros difference -B: >for each plan -B: >that makes 30 euros at the end of the experiment -B: >each -B: >person -B: >A and B -B: >2 minutes left -A: >so well we are going to do it because otherwise we will not agree -B: >1 minute -B: >ok -B: >gone	
H$_{co}$wC, Group 4: -B: > Hello you have already chosen? -A: >hi! I think that the best solution is to maximize our gains -A: >yes -B: >completely agree, i do	**0** **[Plan 0]** **(2 rounds)**
H$_{co}$wC, Group 5: -B: >do you understand something? -A: >yes -B: >do i choose a number at random? -A: >if you are naughty you don't care about C -B: >ok	**0** **[Plan 0]** **(1 round)**
H$_{co}$wC, Group 6: -B: >don't you think that it's not very nice to make C lose 4.8 euros? -A: >yeah that's true	**1** **[Plan 2]** **(2 rounds)**
H$_{co}$wC, Group 7: -B: >1 and we don't talk anymore	**1** **[Plan 2]** **(7 rounds)**
H$_{co}$wC, Group 8 (no communication)	**0.5** **[Plan 1]** **(2 rounds)**
H$_{co}$wC, Group 9: -A: >what do you think, do we validate? -B: >well that's what is best for us -A: >i agree, i confirm -B: >me too, i confirmed	**0** **[Plan 0]** **(1 round)**
H$_{co}$wC, Group 10: -B: >you're too tough with C who's with us -B: >I suggest a choice between 3 et 5 and not smaller -A: >you're right -B: >so 3 4 or 5 -A: >I suggest 4 -A: >is that ok with you? -B: >if you want but we're ripping him off... if I were him I would be disappointed -A: >i would be disappointed too -B: >So what do we do? -A: >in fact you're right, the three of us earn more with 5 than with 4 -A: >so better 5 -B: >Nice computation... the total is indeed bigger... -A: >thanks...but it's only 20 cents -B: >Still... -A: >So do we agree for the 5? [Continued Overleaf]	**2.5** **[Plan 5]** **(4 rounds)**

-B: >Did you calculate the other cases? -A: >yes it's the best -B: >then it's fine with me -A: >ok	
H$_{co}$wC, Group 11: -A: >do we agree for plan 0? -B: >ok -B: >that's not nice for C -A: >that's not nice for C -B: >lol -B: >I confirmed	**0** **[Plan 0]** **(2 rounds)**
H$_{co}$wC, Group 12: -A: >plan 1, ok? -A: >plan 0 sorry! -B: >ok -A: >ok -A: >not the 0 !! must be better! -A: >so? -B: >i think that player C loses everything no? -B: >but for me it's ok -A: >nope i think he earns €1 !!! -A: >ok for the 0??? -B: >ok -A: >cool!	**0** **[Plan 0]** **(2 rounds)**
H$_{co}$wC, Group 13 (no communication)	**0** **[Plan 0]** **(5 rounds)**
H$_{co}$wC, Group 14: -A: >that means that C has nothing	**1.5** **[Plan 3]** **(4 rounds)**
H$_{co}$wC, Group 15: -A: >1 -B: >3 -A: >ok -B: >what ok -A: >i suggest 3 TOO	**1.5** **[Plan 3]** **(2 rounds)**
H$_{co}$wC, Group 16: -A: >I think we must choose the strategy 0 to maximise our gains -B: >i completely agree!	**0** **[Plan 0]** **(1 round)**
H$_{co}$wC, Group 17: -A: >hi B -B: >Hi A ;) -A: >:) -B: >so what do we do? -A: >well i don't know -A: >do you think C's nice? -B: >no idea :)))))))) -A: >number 3? -B: >why? -A: >well no idea :) -B: >i propose the following -B: >either we pick the extreme -B: >No. 0 -A: >ok [Continued Overleaf]	**3** **[Plan 6]** **(1 round)**

-A: >but that isn't nice	
-B: >or the other extreme, 6	
-A: >why 6?	
-B: >from 6 onwards he'll only get 1.2	
-B: >and we get less than 2 Euros	
-A: >in any case less than 5 wouldn't be nice	
-B: >yes, ok	
-A: >if not, 5	
-B: >C 0?	
-A: >yeah	
-A: >so 5 or 6	
-B: >ok, let's go for 6	
-A: > ok, let's do it	
-B: >ok?	
-A: >we validate for 6?	
-B: >yes, plan 6	
-A: >ok	
-B: >and then at the end of the experiment we present ourselves to each other?	
-B: >and we look for our C?	
-A: >if you want but i'm in a hurry!	
-A: >start by answering	
-B: >me too :)))	
-A: >confirm plan 6!	
-B: >i did so, done!	
-B: >ok	
H$_{co}$wC, Group 18 (no communication)	**0** **[Plan 0]** **(1 round)**
H$_{co}$wC, Group 19: -B: >plan 1 -A: >hi with this plan we can earn the most, do you agree? :) -B: >yes that's 4.5 each -A: >well, ok, plan 1 then :) -B: >ahh no wait -B: >it's 0 i didn't see it -B: >sorry	**0** **[Plan 0]** **(3 rounds)**
H$_{co}$wC, Group 20: -A: >go -B: >ok -B: >plan zero? -A: >why? -B: >well, that's where we earn most.... -A: >ah yes i didn't see it -B: >you're turn to validate ;)	**0** **[Plan 0]** **(1 round)**

Appendix E.2: Literal transcripts of Chat log files in $H_{av}wC$

Group id and chat data	Foregone Payoff [Plan #'s]
$H_{av}wC$, Group 1: -B: >hello -A: >hello -B: >plan 0 seems to me the most obvious, don't you think? -B: >we both earn 5 -A: >yes -B: >poor C…! -A: >hahaha^^ -B: >shall we choose immediately? -A: >yes unless you still want to think it over -B: >not really … it's pretty clear! -A: >ok! -B: >ok, it's done	**0** **[Plans 0,0]**
$H_{av}wC$, Group 2: -A: > what type of proposition do you plan on taking? plan 0? -B: >yes -B: >i'm choosing 0 -A: >no scruples over C -A: >ok -B: >no none at all, if he were you he would have done the same -A: >LOL -A: >that's clear -A: >well then let's validate! -B: >let's do it	**0** **[Plans 0,0]**
$H_{av}wC$, Group 3 (no communication)	**0** **[Plans 0,0]**
$H_{av}wC$, Group 4: -A: >we are going to choose the plan that maximizes the gains of all players of our group -A: >but for this one should accept a plan rather equitable for all three of us -A: >me and you won't be able to maximize our profits -A: >what do you think about this? -A: >on the other hand, we'll have maximized the gains of all three of us -A: >thus I choose plan 6 -A: >what do you think about this? -A: >anyway, we've got to agree on a plan if we want to earn money	**2.5** **[Plans 4,6]**
$H_{av}wC$, Group 5: -A: >What are you thinking of doing for c? -A: > Personally i was considering plan 7 or at worst 5 but the other plans are really mean -A: >??? -A: >actually plan 6 - plan 7 is stupid lol -A: >hello? -B: >I thought that everyone gets the average -A: >yeah but if we both pick the same plan, we would get the average of the same thing, that is the plans that we've chosen -B: >the highest average is 5 -A: >if we both pick 6, we'll get the outcome from 6 -A: >if we pick plan 5, it's rough on C, don't you agree? -B: >I don't know what to do [Continued Overleaf]	**3** **[Plans 6,6]**

-A: >I would go for 6, or 5 in the limit -B: >We would both be tempted by plan 0 but well, I wouldn't have liked to be C -A: >yeah I think that we shouldn't screw C over -B: >is 6 fine -A: >sure, that's a deal! -A: >i pick 6 -B: >me too -A: >done	
H$_{av}$wC, Group 6: -A: >what plan do you propose? -B: >I would choose plan 0 -B: >what do you think about that? -A: >I have already chosen plan 3 -B: >why plan 3? -A: >I don't really know -A: >and you? -B: >the highest gain is from 0 -A: >maybe it's a trick -A: >but go for it -A: >me I already validated it -A: >I'm waiting for your decision -A: >watch out for the time	**0.75** **[Plans 3,0]**
H$_{av}$wC, Group 7: -B: >Do you know which to choose? -A: >in fact i have already chosen i thought you didn't want to communicate -A: >i already chose plan 4 -B: >ah and which one did you pick -A: >now it depends on whether you want to make money -B: >3 3 and -1.2 -B: >is that it? -A: >yes -A: >I find this rather honest -A: >what do you think about it? -B: >yeah it's clear it's bad for C -A: >and you which proposition would you see? -B: >2.5 2.5 and 0 -A: >me i'm not for giving money to B -B: >I think i'll pick plan 4 too -A: >oops I meant… to C! lol -B: >lol -A: >go ahead -B: >you don't want to give to C? -A: >well no, it's up to us to take a decision -A: >ok you've seen there isn't much time left -B: >i pick plan 2 -B: >ok? -A: >ok -A: >I accepted	**1.5** **[Plans 4,2]**
H$_{av}$wC, Group 8: -B: >what choice are you think of? -A: >plans 7, 8, 9 and 10 are useless : C doesn't win more and we lose…. -A: >either we do our all to win a max of money for US and we don't care about C -B: >yes that would be a pity, i'm leaning towards the 0 -B: >i chose this -A: >it's in this case where we earn a max, but C gets done over …. -B: >that's the game! [Continued Overleaf]	**0** **[Plans 0,0]**

-A: >I'm thinking of 0 too…. There will be other experiments in which he won't be C -B: >that's the right choice ;) -A: >clearly ! i'm for for money, even if it's not much ;)	
H$_{av}$wC, Group 9: -B: >which do you propose? -A: >7 -B: >me i was thinking of plans 5 or 6 -B: >so? -A: > you are right 6 is better for us three -B: >or the 5. -B: > because the 5 doesn't lose anything -A: >no because C doesn't win anything -B: >but doesn't win anything -A: >let's be collective -B: >except for the 7 euros -A: >So what's your choice? -B: >5 or 6 -A: >i prefer 6 to best equilibrate the gains of the three participants -B: >ok -B: >for the 6 then -A: >so we validate -B: >GO	**3** **[Plans 6,6]**
H$_{av}$wC, Group 10: -A: >plan 0? -B: >lol -B: >that would be mean for C^^ -A: > you 5 me 6 -B: >wait I'm calculating -B: >which plan do you pick? -A: >6 -B: >that's not the most efficient -B: >ah yes -A: >so what do you propose -B: >the 6 is the most efficient -B: >and shares the gains better -A: >then if we share, let's pick that one -B: >or the 5… -A: >choose the 5 and i pick the 6 -B: >either we ensure a fair distribution of resources or personal well-being ^^ -B: >ok -B: >i pick 5 -A: >ok -A: >i chose your turn…	**2.75** **[Plans 6,5]**
H$_{av}$wC, Group 11: -A: >we don't care a darn if C loses money ok? -A: >i choose plan 0 -A: >and you? -B: >yes .. fine -A: >12 euros is not that bad -A: >so i accepted and validated	**0** **[Plans 0,0]**
H$_{av}$wC, Group 12: -A: >hi! -B: >i propose plan 1 -B: >we both win 4.5 -A: >why not 0 -B: >what do you think about that ???????? [Continued Overleaf]	**0** **[Plans 0,0]**

-B: >i didn't see the 0	
-B: >not bad	
-A: >so 0 then?	
-B: >we pick 0	
-A: >ok!	
-B: >in any case c he has no chance	
-A: >that's clear	
-B: >don't you think that there is a trick	
-A: >yes there is a trick	
-A: >why is it the average!	
-B: >yes it's true but it seemed too simple to me	
-B: >but i thus validate the 0	
-B: >did you validate???	
-A: >yes!	
-B: >me too	
-B: >i wouldn't want to be C	
-A: >why?	
-B: >C has no decision to take	
-B: >and he depends on us	
-A: >yeah but he answers questions	
-A: >it's weird	
-B: >yeah	
H$_{av}$wC, Group 13: -A: >hello, i propose plan 5 -B: >What do you propose? -A: >or plan 0 but then C won't get anything and you? -B: >i don't know, i hesitate -B: >still i came to win some money -A: >me too -B: >and we don't know C -A: >yes but he also came to earn money -B: >and then to give myself a good conscience i tell myself that if it happened C would pick little -B: >maybe plan 0 too -B: >frankly it's a really difficult question -B: >we are asked to choose between cupidity and humanity -A: >ah yes -B: >what tempts you most? -A: >plan 0 -B: >ok for me too -B: >we pick it? -A: >ok i validate -B: >ditto -B: >it's done	**0** **[Plans 0,0]**
H$_{av}$wC, Group 14: -A: >hello -B: >i think that it would be nice for all three of us to choose this plan if you're ok? -B: >(hello) -B: > :) -A: >:) -A: >which plan are you talking about? -B: >plan 6 -B: >sorry -B: >it's still the one that causes less damage, no???? -A: >plan 5 doesn't cause any either -B: >well it's bad for C [Continued Overleaf]	**2.75** **[Plans 5,6]**

-A: >he doesn't lose anything -A: >should take a look -B: >errm… yes but we don't earn much either -A: >if we chose different plans -A: >the average could be more interesting -B: >no I think we need to agree… -A: >no -B: >nyeah -B: >ok -A: >if we don't agree it's the average -B: >i choose 6 and you 5 ??? -B: >are you ok ???? -B: > yeah -A: >in any case, one of us absolutely must choose plan 6 -B: > yes i choose 6 i find that fair -B: >ok ??? -A: >wait i'm looking at what's best -A: >we still have time -B: >i choose 6 :) i think it's clear…. It's the most egalitarian one -A: >ok choose 6 -B: >how about you ??? -A: >lol i continue searching -B: > you know he can refuse it and if so we are screwed -A: >no C cannot refuse -B: > i think that we shouldn't be too mean …. it can fire back…. on us :) -B: >ooops :) yes -A: >choose 6 -B: >and you? -A: >i take the risks :) -B: > meaning ??? -A: >if it fires back it will on me -B: >possibly yes! -A: >ok i choose 5 -B: >play it with a bit of modesty -B: > ok! :) -A: >the difference isn't worth it -B: >yep -A: >we validate	
H$_{av}$wC, Group 15: -A: >i propose to choose plan 0, what do you think? -B: >i choose plan 4 and you 6 so that C doesn't lose, is that ok with you? -B: >what have you decided? -A: >i haven't yet validated my decision -A: >we should pick decision 0 -B: >Well OK for decision 0 (too bad for C) -A: >we validate 0, ok? -B: >ok !! -A: >done	**0** **[Plans 0,0]**
H$_{av}$wC, Group 16: -A: >allo -B: >yes -B: >i think i've made my choice -A: >and which one is it? -B: >plan 4 -B: >and you? -A: >me, I pick 1 [Continued Overleaf]	**0.25** **[Plans 1,0]**

-B: >ok otherwise i pick the 3 -A: >or the 0 -B: >so as to get a round number -B: >ok for the 0 -A: >ok -B: >i validate -A: >ok	
H_{av}wC, Group 17: -A: >hello -B: >hello -A: >which one do you prefer? -A: >personally i'm here for the money so …. -B: >i think that in any case, we don't quit -B: >me too -A: >so then we pick plan 0 -B: >i think it's the best to do… sorry for c -A: >yes -A: >after all that's the game -B: >i wonder who will pick plan 10… -A: >whoa nobody in my opinion -B: >well there's only 8 minutes left to wait ^^ -A: >that's a lot nonetheless 10 minutes for this -B: >yes -A: >before, i was hoping not to fall into being a C, we've been lucky -B: >yes, fortunately it's anonymous ^^ -A: >that's for sure	**0** **[Plans 0,0]**
H_{av}wC, Group 18: -A: >which plan shall we choose -B: >let's first do some calculations -A: >plan 6 -A: >i already picked -A: >i validate the 6 -B: >wait just a sec -A: >Ok -A: >it's either plan 1 -A: >or it's 0 -A: >or it's 6 -A: >but i think that C is going to choose 6 because he also looks at our gain -B: >you are right -A: >and if one calculates in terms of averages -A: >if you pick something else and me another… we can then take the average -A: >what do you propose? then? -B: >for 5 for example -A: >we are going to do 5 then -A: >Ok -B: >now? -A: >confirm if it's ok -B: >ok with me and you? -A: >it's fine -B: >so we validate -A: > yes	**2.5** **[Plans 5,5]**
H_{av}wC, Group 19: -A: >i propose we pick plan 1 -B: >Quitting is disadvantageous for everybody, it's best avoided in the interest of us all, including C -B: >I'm checking [Continued Overleaf]	**0** **[Plans 0,0]**

-B: >It's the best for both of us -A: >or radically plan 0 but C will be disadvantaged -A: >For both of us 0 is the best -B: >Plan 7 being the most equitable. -B: >yes -A: >well what do we pick then? -B: >with the 0, C earns one euro -A: >me i say that we pick 0 -A: >i propose -B: >I agree. -A: >ok	
H_{av}wC, Group 20: -B: >what do you want to choose? -A: >i was thinking about plan 6 or 7 and you? -B: >i think we agree about eliminating the propositions « Quit » and plan number 10 -A: >right -B: >i would rather go for the first ones! -B: >the 4? -A: >yes that would be fine with me -B: >no? -B: >ok -B: >I validated	**2** **[Plans 4,4]**

Appendix E.3: Literal transcripts of Chat log files in VwC

Group id and chat data	Foregone Payoff [Plan #]
VwC, Group 1: -B: >hello good luck with taking your decision... -A: >thank you -A: >two secs, i'm hesitating -B: >sure, i would also hesitate if i were in your place -B: >take your time	**0.5** **[Plan 1]**
VwC, Group 2: -B: >hello -A: >hello -A: >I haven't finished analysing the different gains -B: >take your time. -A: >thanks -A: >so, we both have the same gain, it can go from 0 to 5 -B: >that's correct -B: >what do you choose? -A: >the more we win the less C wins -A: >do you mind if C has a negative gain? -B: >in general, i prefer equity! -A: >i share your point of view -A: >so, our gains range from 0 to 2.5 -B: >yes -B: >the game wants us to give him the maximum gain while trying to maximise our gains too -A: >it's not the game that wants us to give the maximum gain -A: >we could very well be completely selfish -B: >yes we could -B: >but i'm not in favour of this choice -A: >fine -B: >then you choose first -B: >"with peace in your mind"! -A: >would plan 5 be fine with you, given that it's a dry run for C -B: >i have mixed feelings -A: >what would you like for C? -B: >it's the best solution for us but C finds himself at the same point as before the experiment -B: >i think that with more or less 50 cents, we could consider a positive gain for C -B: >by choosing plan 6 -A: >"the best solution for us" is not plan 6 but plan 0 -B: >of course, but that's not fair. -A: >absolutely, but it's only an experiment .... -B: >we were given these roles at random, we could have been C! -A: >absolutely, i wonder what this player is doing right now... -B: >wonder if we are going to be selfish or if we are going to thinking about him, may be! -A: >would you be ready to refuse a gain greater than 2, by concern for equity? -B: >yes -A: >bravo -B: >and you? -A: >if i were in your place ??? -B: >yes -A: >yes, i think, i wouldn't like to be C -B: >i agree! -A: >so i suggest plan 6 [Continued Overleaf]	**3** **[Plan 6]**

-B: >i agree for plan 6 -A: >no regret ???? plan 6 and no other -B: >no, no regret. -A: >very good, so, MAKE ROOM FOR PLAN 6 !!!! -B: >ok -A: >you don't have anything more to add	
VwC, Group 3: -A: >player B i suggest plan 6 -A: >or do you prefer something else???? -B: >all three winners, ok!	**3** **[Plan 6]**
VwC, Group 4: -B: >suggest 0 -A: >yep, it's a good idea	**0** **[Plan 0]**
VwC, Group 5: -B: >which strategy are you going to choose? -A: >plan 5, no? -B: >poor player C :) i thought that plan 6 was a good compromise, -B: >it yields positive gains to us all -A: >Right I can hardly imagine myself shrinking C's gains to 1euro... -B: >yes, that wouldn't be very « fair play »! -A: >so do we choose 6?? -B: >you are the decision maker, but i think it's the best. -B: >however, i don't know how many times we are playing, -A: >ok for 6...	**3** **[Plan 6]**
VwC, Group 6 (no communication)	**0** **[Plan 0]**
VwC, Group 7: -A: >hello. I suggest plan 0, which seems to our advantage, although C will be penalised -B: >OK -A: >gone	**0** **[Plan 0]**
VwC, Group 8: -B: >so ?	**5** **[Plan 0; B Quits]**
VwC, Group 9: -A: >hi -B: >hello -A: >what do you think about the plans -B: >i wouldn't like to have to choose -A: >it's a bit unfair if we want to get rich, no? -B: >it's all a question of solidarity -A: >yes, i agree -A: >yes -B: >yes -B: >it's also the game -B: >i don't know, the more we win and the more C loses -A: >perhaps i should choose the optimal choice -A: >and then we divide -B: >optimal for whom? -A: >do you agree? -A: >for everybody -B: >for us the optimal choice is plan 0 -B: >the + equitable is plan 7 or 8 -A: >yes -B: >but at the same time, the total gain is inferior to that of plan 0 for example [Continued Overleaf]	**3** **[Plan 6]**

-A: >but with 5 we have a total gain of 5 -B: >no, i haven't taken into account C's losses -A: >with 6 5 -B: >yes -A: >5,2 indeed -A: >i think that it's the best plan -B: >the global optimum is the 5 i think -A: >6 -B: >then it depends if you want solidarity or if you are selfish -B: >yes 6 -A: >yes, of course -A: >6 gives 5,2 -B: >yes -A: >do you agree if i choose it -A: >or 0 if we want to be selfish -B: >you are the decision maker. In any case it's in my interest to always validate your choice, -B: >it will always yield more than if i quit -A: >that's for sure -B: >(or the same) -A: >so I choose 6 -B: >ok	
VwC, Group 10 (no communication)	**5** **[Plan 0;** **B Quits]**
VwC, Group 11: -B: >hello! -A: >plan 0 yields more -A: >bye	**0** **[Plan 0]**
VwC, Group 12: -A: >which plan do you suggest, i think that 4 would be ok -B: >why 4? I would choose 0 because it would yield 5 euros. -B: >it doesn't matter if C gets only 1 euro! -A: >it's true that i haven't thought that way -B: >so what do you choose? -A: >thus we choose 0 -B: >OK !	**0** **[Plan 0]**
VwC, Group 13 (no communication)	**3** **[Plan 6]**
VwC, Group 14: -A: > an idea? -B: >errm not really -B: >but it would be good to try a number -A: >if i choose 0, that's ok with you? -B: >yes -A: >ok	**0** **[Plan 0]**
VwC, Group 15 (no communication)	**1.5** **[Plan 3]**
VwC, Group 16 (no communication)	**2.5** **[Plan 5]**
VwC, Group 17: -B: >which plan? -A: >errm i'm tempted by plan 0.. -B: >ok -B: >you're the one who proposes	**0** **[Plan 0]**

VwC, Group 18 (no communication)	**0** **[Plan 0]**
VwC, Group 19: -B: >choose 0, it's the best i think -A: >yes it's interesting, i still think a bit -B: >all right -A: >is there another plan that you prefer? -B: >no -B: >the 0 maximizes our profits -A: >the 5 prevents losses to C -A: >it's tough -B: >yes i know but it's the game -A: >... -B: >even if that's not nice for C -A: >he would leave with €1 -B: >i know but we would leave with €12… -B: >i know that it's no luck to be C, but it's the game -A: >it's true -A: >if you were A you'd have chosen 0 for sure -B: >yes i think so, even if i think it's cruel for C -B: >We had one chance out of 3 to be C, we've been lucky not to be it so let's take advantage of this -B: >it's a game of luck -A: >i don't want plan 0 so much anymore -B: >so pick plan 1 -B: >why don't you want plan 0? -A: >he'd leave with €1 -B: >yes i know, but what can you do…. someone must lose -A: >not necessarily -A: >i like plan 5 more -B: >in any case C can't hope to get high gains, so why not go with plan 0 -A: >he didn't come for nothing. put yourself in his shoes -B: >i know, if i were C i would say it's not nice but i would understand that the two -B: >others -B: >want to maximize their profits	**2.5** **[Plan 5]**
VwC, Group 20 (no communication)	**0** **[Plan 0]**

Appendix F.1: Analysis of chat data

We first categorize discussions into three types: a discussion is *group-regarding* (GR) if insiders make arguments or comments in favor of a group-centered approach (e.g., "Let's ignore the third party"); a discussion is *other-regarding* (OR) if insiders make arguments or comments in favor of an approach that considers the outsider's payoff (e.g., "Let's maximize social welfare"); a discussion is *neutral* (N) if neither argument is discernible (i.e., it contains a mix of *group-* and *other*-regarding arguments) or if both arguments are raised (i.e., one insider favors group-egoism while the other favors altruism).[5]

Then, to study the extent of bonding between insiders, we classify a discussion as *bonding* if the two insiders' use of the first-person plural (we/us) indicates a mutual identification between them to the exclusion of the outsider. (We ignore subtler indicators, since necessarily more subjective.) To achieve this classification, we proceed in two steps. First, we classify individual chat messages that use the term "we" or "us" as 'us2' or 'us3': a chat message is 'us2' if the insider uses "we" or "us" to refer to the two insiders ("us two"); a chat message is 'us3' if such a usage refers to both insiders and the outsider, i.e., to all three players in the game ("us three"). Second, we classify the chat as *bonding* if it contains no 'us3' messages *and* either both insiders send an 'us2' message *or* one insider sends an 'us2' and the other responds affirmatively (which we take as implicit confirmation of the identification); otherwise, we classify as *no-bonding*.[6]

These coarse proxies for group-centrism and bonding give the classifications reported in Table A, on which we conduct Fisher 2×2 exact tests based on: (i) the number of groups with *bonding* instead of *no bonding* in $H_{co}wC$, $H_{av}wC$ and VwC (9 out of 16, 11 out of 19 and 2 out of 13, respectively); (ii) the number of groups with *group-regarding* instead of *other-regarding* or *neutral* discussions among the *bonding* and *no bonding* groups of $H_{co}wC$ (7 of 9 and 2 of 7, respectively), of $H_{av}wC$ (6 of 11 and 1 of 8, respectively) and of VwC (2 of 2 and 2 of 11, respectively); (iii) the number of groups that generate *profit-maximizing* instead of *non-profit-maximizing* outcomes among the *bonding* and *no bonding* groups of $H_{co}wC$ (8 of 9 and 2 of 7,

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[5] We do not distinguish between egocentrism and group-centrism, because the material payoff concerns of both individuals inside a group are identical.

[6] In this classification, we essentially let an 'us3' message dominate 'us2' messages. We do this because the fact that the two insiders are the only two chatting creates a bias towards 'us2' usages. Also, we require both parties to identify as 'us2', since bonding is a two-sided affair.

respectively), of $H_{av}wC$ (8 of 11 and 1 of 8, respectively) and of VwC (2 of 2 and 4 of 11, respectively). The test outcomes are reported in the text just after Observation 3.[7]

Excluding *neutral* discussions, we also find that *group-regarding* discussions are relatively more frequent in $H_{co}wC$ than VwC, but the difference fails to be significant (p = .849, one-tailed 2×2 Fisher exact test; p = .630 for $H_{av}wC$ vs. VwC).[8]

Table I: Bonding and group/other-regarding discussions

		Group- Regarding (GR)	*Other-* Regarding (OR)	*Neutral* (N)
$H_{co}wC$	Bonding	1(0); 4(0); 9(0); 11(0); 16(0); 19(0); 20(0)	17(3)	3(0)
	No bonding	5(0); 12(0)	6(1); 10(2.5); 14(1.5)	7(1); 15(1.5)
	No comm.	2(0); 8(0.5); 13(0); 18(0)		
$H_{av}wC$	Bonding	1(0); 2(0); 8(0); 11(0); 12(0); 17(0)	5(3); 18(2.5)	13(0); 15(0); 20 (2)
	No bonding	6(0.75)	4(2.5); 9(3); 10(2.75); 14(2.75)	7(1.5); 16(0.25); 19(0)
	No comm.	3(0)		
VwC	Bonding	7(0); 12(0)		
	No bonding	11(0); 17(0)	3(3); 5(3); 9(3)	1(0.5); 2(3); 4(0); 8(Q); 14(0); 19(2.5)
	No comm.	6(0); 10(Q); 13(3); 15(1.5); 16(2.5); 18(0); 20(0)		

Note: Cells state group identity; Foregone payoff of implemented decision in parenthesis; Q = Quit; comm. = communication.

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[7] Arguably, one could categorize non-communication as *no bonding* for (i) and (iii), and as *no bonding* and *neutral* for (ii); the results are then even more significant for (i) and (ii) and they remain significant at the 10% significance level for (iii).

[8] We tried several other more refined codings of subjects' conversation files to identify differences across organizational structures but we only report those that revealed significant differences.

Appendix F.2: Analysis of time differences

Organizational structure and communication affect how long it takes to implement a plan.[9] Reaching a consensus takes time and our data confirm that, absent communication, horizontal structures take significantly longer to implement a plan than do vertical ones ($p = .0014$ for H_{co} versus V and $p = .0000$ for H_{av} versus V, one-tailed randomization tests). Further, horizontal structures with averaged payoffs, H_{av}, take significantly longer than H_{co} ($p = .0270$, one-tailed) (perhaps because the consensual structure reduces independent-mindedness). Communication also takes time: adding the communication option significantly increases total time in vertical structures ($p = .0009$, one-tailed) and in H_{av} ($p = .0000$, one-tailed) but not in H_{co} ($p = .3781$, one-tailed) where conversations appear to substitute for rounds of silent proposals. Indeed, the time-advantage of vertical over horizontal structures disappears when communication is allowed ($p = .8938$ for VwC versus H_{co}wC, one-tailed), though H_{co}wC remains faster than H_{av}wC ($p = .0000$, one-tailed).

Table II : Average time to reach decision

	H_{co}	H_{av}	V	H_{co}wC	H_{av}wC	VwC
Total time	3'27"	4'16"	1'29"	3'03"	7'10"	4'35"
	(2'44")	(1'58")	(1'21")	(2'21")	(2'08")	(4'19")

Note: Time in minutes and seconds (with standard deviations).

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[9] Formally, in horizontal treatments H_{co} and H_{co}wC, each game consists of N rounds where N depends on when consensus is reached (if at all); if in each round n, A and B make proposals y_A^n and y_B^n after a delay of t_A^n and t_B^n, the round-n delay is $t^n = \text{Max}\{t_A^n, t_B^n\}$; if the game ends in an agreement in round N, i.e., $y_A^n \neq y_B^n$ for all $n < N$ and $y_A^N = y_B^N$, the total time delay is $t = \sum_{n=1}^{N} t^n$.

Appendix G.1: Cross-treatment resistance differences

We also test for cross-treatment differences in resistance. The average resistance of the *kind* proposers is equal to 0.251 (s.d. 0.29) in H_{co} and to 0.411 (s.d. 0.47) in $H_{co}wC$. The greater resistance of *kind* proposers in $H_{co}wC$ relative to H_{co} is consistent with a strong in-group bias in $H_{co}wC$, but the difference is insignificant ($p = 0.150$, one-tailed randomization test).

Appendix G.2: First proposals with(out) prior communication

We compare the resistance indices of *kind* and *unkind* participants in groups where no chat took place *before* the first proposals were submitted, with those of participants in groups were A and B did communicate before submitting their first proposals. First, a comparison of the indices of kind participants reveals no significant difference between groups where no chat took place before their first round of proposals and groups where a chat took place before their first round of proposals ($p = 0.7400$, two-tailed). Second, we reach the same conclusion when looking for a significant difference between kind and unkind participants in groups with and without chats before submitting their first proposals (p-values > 0.557, two-tailed). Table C also reports the actual foregone payoff and the average of the first proposals of each group, but we did not find a significant difference between groups with and without chats before submitting their first round of proposals (p-values $> .7400$, two-tailed) [$p = 1.0$ for actual foregone payoffs, $p^{\clubsuit} = .820$ and $p^{\spadesuit} = .740$ for average 1st proposal foregone payoffs with/without starred groups, all two-tailed].

Table III: Effect of communication on first proposals and resistance in $H_{co}wC$

No chat *before* submitting 1st proposals						Chat *before* submitting 1st proposals				
Group id	Foregone payoff	Average foregone payoff of 1st proposals	Resistance index			Group id	Foregone payoff	Average foregone payoff of 1st proposals	Resistance index	
			kind	*unkind*					*kind*	*unkind*
1	0	0.5	0	1		3	0	1.5	0	1
2[*]	0	0	n.a.	n.a.		4	0	0.25	0	1
6	1	1.25	0.333	0.667		5[*]	0	0	n.a.	n.a.
8	0.5	0.25	1	0		7	1	0.75	1	0
9[*]	0	0	n.a.	n.a.		11	0	0.75	0	1
10	2.5	1.75	1	0		12	0	0.25	0	1
13°	0	0.75	n.a.	n.a.		15	1.5	1	1	0
14	1.5	1.25	0.6	0.4		16[*]	0	0	n.a.	n.a.
18[*]	0	0	n.a.	n.a.		17[*]	3	3	n.a.	n.a.
19	0	0.25	0	1		20[*]	0	0	n.a.	n.a.
Average	0.550	0.857♣ 0.600♠	0.489	0.511		Average	0.550	0.750♣ 0.750♠	0.333	0.667

Note: n.a.: not applicable; a star ([*]) indicates groups with only one round of proposals; a circle (°) indicates groups in which the consensus (last) proposal fails to lie between the initial proposals; in either case, resistance cannot be assessed; ♣: without starred groups; ♠: for all groups.