Organisational structure, communication and group ethics

Appendices

Contents

Appendix 1a: INSTRUCTIONS (Horizontal 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 :
- a gain which is the same for participants A and B,
- 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 et 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 in light blue and light red, respectively.

1

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 nor 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 to send the message. 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 for participating in 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 you will be 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 it to one of the administrator in the laboratory, not to another participant. In this experiment, you are not allowed to communicate with the other participants.

Appendix 1b: 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.

<u>**Participant A**</u> 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.

<u>**Participant B**</u> 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.

<u>**Participant C**</u> 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 nor 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 to send the message. 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 for participating in 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 you will be 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 it to one of the administrator in the laboratory, not to another participant. In this experiment, you are not allowed to communicate with the other participants.

Appendix 2a: Screenshots (V and VwC)

FormHPlayerProp A

Tableau des gains

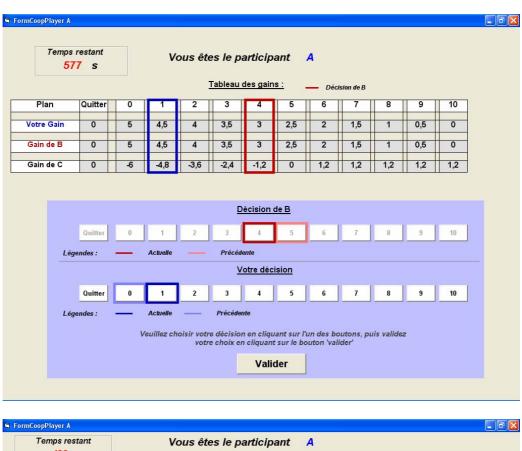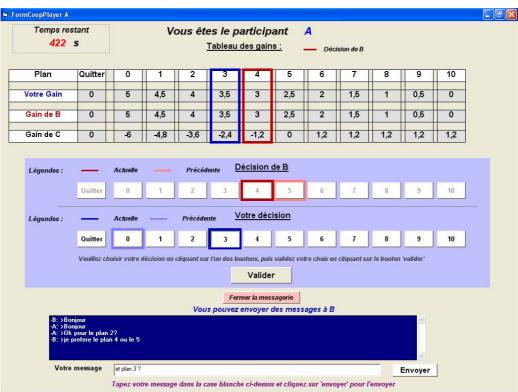| Plan	Quitter	0	1	2	3	4	5	6	7	8	9	10
Votre Gain	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de B	0	5	4,5	4	3,5	3	2,5	2	1,5	1	0,5	0
Gain de C	0	-6	-4,8	-3,6	-2,4	-1,2	0	1,2	1,2	1,2	1,2	1,2

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

Appendix 2b: Screenshots (H and HwC)

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

6

Appendix 3a: Transcripts of Chat log files in HwC

HwC, 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 cool for him -A: >we choose 0 then ? -B: >yes -A: >ok	**Plan 0**
HwC, Group 2 (no communication)	**Plan 0**
HwC, 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 -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 minutes [Continued Overleaf]	**Plan 0**

-B: >ok -B: >gone	
HwC, 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	**Plan 0**
HwC, 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	**Plan 0**
HwC, Group 6 -B: >don't you think that it's not very cool to make C lose 4.8 euros? -A: >yeah that's true	**Plan 2**
HwC, Group 7 -B: >1 and we don't talk anymore	**Plan 2**
HwC, Group 8 (no communication)	**Plan 1**
HwC, 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	**Plan 0**
HwC, 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? -B: >Did you calculate the other cases? -A: >yes it's the best -B: >then it's fine with me -A: >ok	**Plan 5**

HwC, Group 11 -A: >do we agree for plan 0? -B: >ok -B: >that's not nice for C -A: >that's not cool for C -B: >lol -B: >I confirmed	**Plan 0**
HwC, 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!	**Plan 0**
HwC, Group 13 (no communication)	**Plan 0**
HwC, Group 14 -A: >it means that C has nothing	**Plan 3**
HwC, Group 15 -A: >1 -B: >3 -A: >ok -B: >what ok -A: >i suggest 3 TOO	**Plan 3**
HwC, Group 16 -A: >I think we must choose the strategy 0 to maximise our gains -B: >i completely agree !	**Plan 0**

Appendix 3b: Transcripts of Chat log files in VwC

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 at your place -B: >take your time	**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 and 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 again greater than 2, by concern for equity ? -B: >yes -A: >bravo -B: >and you? -A: >if i were at your place ??? -B: >yes -A: >yes, i think, i wouldn't like to be C -B: >i agree! -A: >so i suggest plan 6 -B: >i agree for plan 6 -A: >no regret ???? plan 6 and no other -B: >no, no regret. -A: >very good, so, ROOM FOR PLAN 6 !!!! -B: >ok -A: >you don't have anything more to add	**Plan 6**

VwC, Group 3 -A: >player B i suggest plan 6 -A: >or do you prefer something else???? -B: >all three winners, ok!	**Plan 6**
VwC, Group 4 -B: >suggest 0 -A: >yep, it's a good idea	**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...	**Plan 6**
VwC, Group 6 (no communication)	**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	**Plan 0**
VwC, Group 8 -B: >so ?	**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 -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 [Continued Overleaf]	**Plan 6**

-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)	**B Quits**
VwC, Group 11 -B: >hello! -A: >plan 0 yields more -A: >bye	**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 !	**Plan 0**
VwC, Group 13 (no communication)	**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	**Plan 0**
VwC, Group 15 (no communication)	**Plan 3**
VwC, Group 16 (no communication)	**Plan 5**

Appendix 4: 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 signalling 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 $y \leq 7$, $w = \beta/1 - \beta$ captures Fehr and Schmidt's (1999) model of fairness with β as the aversion to self-advantageous inequality; note that $w > 1$ can be viewed as $\beta > 1/2$.[1]

Recall that each actor's preferred outcome is given by $y(w) = 6.\mathrm{I}_{\{w>5/12\}}$ where I is the $\{0,1\}$ 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 maximises 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 and for VwC and HwC. This reinforces Conjecture 0, but the equilibrium assumption is implausibly strong; for instance, preference signalling is likely in H and impossible in V. Nonetheless, predicting a specific treatment effect requires strong distributional and equilibrium assumptions.

---

[1] In our simple setting the related models of Bolton and Ockenfels (2000), Charness and Rabin (2002), and Cox, Friedman, and 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 $y \geq \underline{y}(w^B)$ where $\underline{y}(w^B) = 20(6w^B - 5)/(12w^B - 5)$. If A knew B's preference type, A would set $y = \mathrm{Max}\left\{y(w^A), \underline{y}(w^B)\right\}$. (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.

Predicting the impact of communication also requires strong assumptions, but we offer an **example where cheap-talk has a plausible 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-signalling" 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 Farrell and Rabin (1996)), so we predict the separating equilibrium in which A (restricted to integer values) sets $y = 2$ where B's type is high and $y = 0$ otherwise. So the average y is 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 forced). In VwC, a self-signalling 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 type 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.

---

[4] C's average payoff *given* $w^A = 0$ is $(1 - p)(-6) + p(-3.6)$ in VwC and $(1 - p)(-6) + p(0)$ in V.

Responsibility-alleviation: an example where C is worse off in V than in H

Suppose $w = 0$ or 1 with equal probability, ½, and suppose perceived responsibilities $r^B(V) = 0$, $r^B(H) = r^A(H) = 0.9$, $r^A(V) = 1$. Consider the equilibrium of H 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 outcome is $y = ½(6) + ¼(2+0) = 3.5$ (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, $y = ½(6) + ½(2) = 4$ (because a proposer with $w = 0$ sets $y = 2$ when uninformed about the responder's type). By contrast in V, when A has $w = 0$, A sets $y = 0$ (rather than the compromise value $y = 2$) even if A knows that $w^B = 1$, because B does not feel responsible in V ($r^B = 0$ implies $w^B \cdot r^B = 0$). So the expected outcome in V is lower at $y = 3$ ($= ½(6)$) and C is worse off.

References

Bolton, G. and A. Ockenfels, 2000, "ERC - A theory of equity, reciprocity and competition", *American Economic Review*, 90, 166-193.

Charness, G. and M. Rabin, 2002, "Understanding social preferences with simple tests", *Quarterly Journal of Economics,* 117(3), 817–869.

Cox J., D. Friedman and S. Gjerstad, 2007, "A tractable model of reciprocity and fairness", *Games and Economic Behavior*, 47, 268-298.

Farrell, J. and M. Rabin, 1996, "Cheap talk", *Journal of Economic Perspectives*, 10(3), 103-118.

Appendix 5a: Analysis of chat data

We first categorise discussions into three types: a discussion is *group-regarding* if insiders made arguments or comments in favour of a group-centred approach (e.g. "Let's ignore the third party"); a discussion is *other-regarding* if insiders argue in favour of an other-regarding approach (e.g. "Let's maximise social welfare"); a discussion is *neutral* if neither argument is discernible or if both arguments are raised (i.e. one insider favours group-egoism while the other favours altruism). Then, to study the extent of bonding between insiders, we define discussions with "bonding" as those where the insiders demonstrate a clear predisposition towards mutual identification by using the word "we" to refer to themselves alone (not themselves plus the third party) and by not pointing out internal differences (c.f. "your" versus "my" interest).[5] These coarse proxies for group-centrism and bonding gives the pair of classifications reported in Table 3, on which we conduct Fisher 2×2 exact tests based on: (i) the number of groups with *bonding* instead of *no bonding* in HwC and VwC (6 out of 13 and 1 out of 11, respectively); (ii) the number of groups with *group-regarding* instead of *other-regarding* or *unclassified* discussions among the *bonding* and *no bonding* groups of HwC (6 of 6 and 2 of 7, respectively); (iii) the number of groups that generate *profit-maximising* instead of *non-profit-maximising* outcomes among the *bonding* and *no bonding* groups of HwC (6 of 6 and 2 of 7, respectively). The test outcomes are reported in the text just after Observation 2.

Excluding neutral discussions, we also find that *group-regarding* discussions are relatively more frequent in HwC than VwC, but the difference just fails to be significant ($p = .1109$, one-tailed 2×2 Fisher exact test).[6] Finally, in line with the virtuous voice idea that insiders who plan to be kind enjoy expressing their kind thoughts, while cynical insiders avoid discussions that might trigger a guilty conscience, a randomisation test on word counts reveals that insiders of other-

---

[5] We classify neutral communications as *no bonding* unless both parties are friendly and relaxed with each other (group 12 of HwC is affected). If instead we proxy for *bonding* by friendly and relaxed (humorous) discussions, the counts are almost identical. Arguably, one could categorise non-communication as *no bonding*; the results are then even more significant (we would then reject the null at $p = .0415$).

[6] We tried several other more refined codings of subjects' conversation files to identify differences across organisational structures but we only report those that revealed significant differences; see below on "bonding": among *group-regarding* discussions, A and B appear to be friendlier towards each other in HwC than in VwC (e.g. in Group 4 of HwC, B jokily adopts Master Yoda's (Star Wars) grammar to support A's suggestion to adopt the most harmful plan); this is consistent with our idea that horizontal structures facilitate bonding among insiders and we test it using Table 3 below.

regarding groups use more words than insiders of groups with group-regarding discussions.[7]

Table 3: Bonding and group/other-regarding discussions

		*Group-*regarding	*Other-*regarding	Neutral
HwC	Bonding	1(0); 4(0); 9(0); 11(0); 12(0);16(0)		
	No bonding	3(0); 7(2)	10(5)	5(0); 6(2); 14(3); 15(3)
	No comm.	2(0); 8(1); 13(0)		
VwC	Bonding	7(0)		
	No bonding	4(0); 11(0); 12(0)	2(6); 3(6); 5(6); 9(6)	1(1); 8(Q); 14(0)
	No comm.	6(0); 10(Q); 13(6); 15(3); 16(5)		

Note: Cells state group identity (implemented plan number); Q = Quit; comm. = communication

Table 4 : Chat data – average number of words

	HwC	VwC
Group-regarding	A: 24.9 (25.6) B: 29.1 (51.1)	A: 14.5 (10.1) B: 9.5 (16.3)
Other-regarding	A: 48.0 (n.a.) B: 70.0 (n.a.)	A: 89.8 (94.7) B: 87.5 (68.9)
Neutral	A: 6.8 (3.0) B: 7.5 (7.6)	A: 5.0 (5.0) B: 10.7 (7.8)

Note: Standard deviations in parenthesis; n.a. = not applicable, only one chat in HwC was other-regarding)

---

[7] Concretely, in VwC, $p = .0571$ for bosses and $p = .0286$ for subordinates (one-tailed randomisation tests) though in HwC, the p-values are .2222 for A and B (one-tailed).

Appendix 5b: Cross-treatment resistance differences

We also test for cross-treatment differences in resistance. The greater resistance of *kind* proposers in HwC relative to H is consistent with the enhanced insider-outsider effect, but the difference is insignificant (p = .1973, one-tailed randomisation test).

One can also compare the average of A and B's first proposals with the average of their final proposals (usually a consensus proposal). Testing for differences between initial and final averages gives insignificant results in H as well as HwC (p-values > .3828, according to one-tailed randomisation tests for related samples). This test is less appropriate, since our dynamic alleviation insight applies to concession size as a *fraction* of initial proposal differences.

Appendix 5c: Analysis of time differences

Organisational structure and communication affect how long it takes to implement a plan.[8] 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 ($p = .0818$, one-tailed randomisation test). Communication also takes time: adding the communication option significantly increases total time in vertical structures ($p = .0011$, one-tailed) (but not in horizontal structures ($p = .4270$, one-tailed) where conversations substitute for rounds of silent proposals). Indeed, the time-advantage of vertical over horizontal structures disappears when communication is allowed ($p = .8691$, one-tailed).

Table 5 : Average time to reach decision

	H	V	HwC	VwC
Total time	2'55"	1'53"	3'05"	4'35"
	(2'36")	(0'55")	(2'33")	(4'19")

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

---

[8] Formally, in horizontal treatments H and HwC, 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 $t = \sum_{n=1}^{N} t^n$.