Appendix A. Supplementary Analysis

A.1. **Minimum Effort Level by Groups.** Figure A.1 plots the minimum effort level for each group over the periods in each treatment. In the two continuous time treatments, the group minimum is accumulated over each 60 seconds period. In the two discrete time treatments, the group minimum is the selected one at the period end. While there are ten groups in each treatment, a figure may show fewer than 10 lines as some of them overlap with one another.

We presents the frequency of efforts staying at the extreme levels in Table A.1. Switches can only occur in one direction at level 1 and level 7. Within a period, the frequency is calculated by the time that the efforts staying at the extreme levels divided by the total 600 seconds. At the start of a period, the frequency is the ratio of the subjects selecting the extreme levels out of all subjects. In the ConMin treatment, the group minimum stays at level 7 for less than 10% of the time both within and at the start of the period. But the percentage is above 30% in the ConFull treatment. Interestingly, the group minimum stays at level 1 for the same amount of time, or approximately 20% in the two treatments. In terms of the individual effort, the percentage at level 7 is higher than that of the group minimum, while the percentage at level 1 is lower than that of the group minimum. Therefore, if we take account of the group minimum at the extreme levels, the percentages of upward switches in the two treatments can only be more different than now reported, and the statistics are already significant. It would not affect our results reported in Section 5.

The group minimum at the extreme levels can be also found in Figures 4 and A.1. In the ConMin treatment, only two groups ever coordinate at the highest effort level, while eight groups coordinate on the lowest effort level at least once during the experiment. In the ConFull treatment, eight groups coordinate at the highest effort level at least once, and five of them

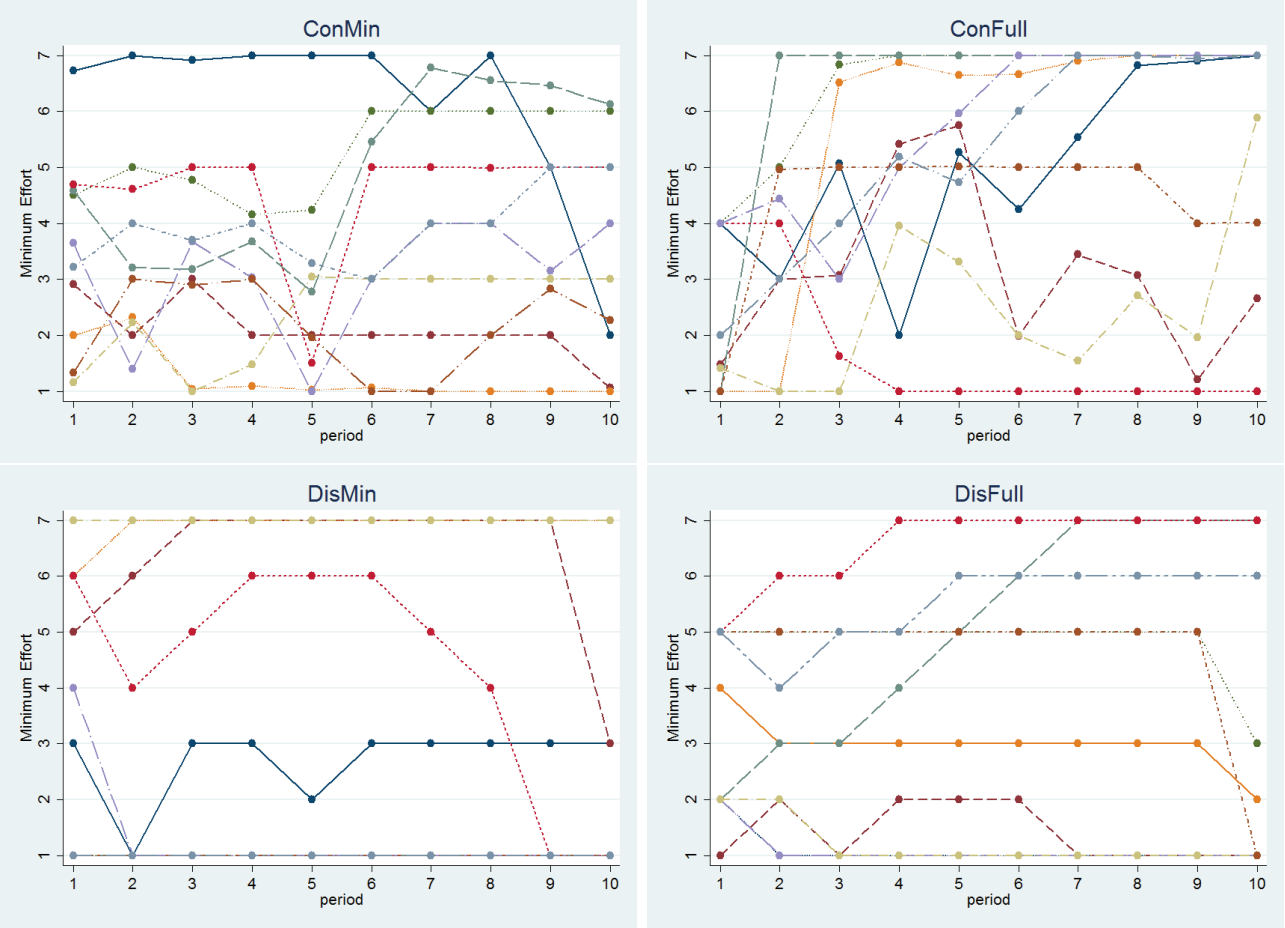

FIGURE A.1. Minimum Effort (Time-weighted within Each Period) of Each Group

TABLE A.1. Efforts and Extreme Levels

	ConMin		ConFull	
	Within Period	Start of Period	Within Period	Start of Period
Group Minimum				
Effort Level 7	9.86%	6.00%	37.91%	33.0%
Effort Level 1	18.43%	26.00%	20.61%	25.00%
Individual Effort				
Effort Level 7	14.05%	8.67%	48.19%	37.17%
Effort Level 1	12.84%	19.67%	14.58%	18.17%

remain there for most of the time after the fifth period. On the other hand, five groups in the ConFull treatment coordinate at the lowest effort level at least once, and one group remain there from period 4 onwards.

Table A.2 counts the number of switches of the group minimum and individual effort that were more than one unit. The percentages are calculated by the multiple-unit switches divided by the all-unit upward switches (shown in Table 3). The group minimum and individual effort levels are more likely to go up by multiple units at the start of the period than within a period. In terms of downward switches, the multiple-unit effort switches are more likely to happen in the ConFull treatment, except for the group minimum at the start of the period.

Table A.2. Multi-Unit Switches

	ConMin		ConFull	
	Within Period	Start of Period	Within Period	Start of Period
Upward Switches				
Group Minimum	4	16	19	8
Percentage	(12%)	(41%)	(22%)	(44%)
Individual Effort	242	269	240	168
Percentage	(14%)	(67%)	(29%)	(70%)
Downward Switches				
Group Minimum	12	2	24	3
Percentage	(13%)	(33%)	(28%)	(17%)
Individual Effort	513	9	438	18
Percentage	(22%)	(47%)	(45%)	(56%)

While Table 3 counts only the number of switches and ignores the magnitudes of the switches, the main conclusions from Tables 3 and A.2 (which considers multi-unit switches) are consistent. Although the number of switches listed in these tables may not be a perfect indicator of cooperation performance, it provides additional information and complement the analysis in effort level changes documented in Section 3.

A.2. **Random Effect Panel Data Regression.** In addition to the Mann-Whitney tests reported in the main text, we have also run random effects panel data regressions. We give the details of these regressions here.

Five random effects models are run. In the first four models, the dependent variable is the individual time-weighted average effort in each period. The subject ID of the participants is the individual dimension and the number of periods is the time dimension. Each model has 2400 observations. Standard errors are clustered at the independent group level. In the last model, the regression is conducted at the group level instead of the individual level. The dependent variable is the time-weighted average minimum effort in each group in each period. There are 400 observations in total.

To compare the effect of the treatments, three treatment dummies are created, with the DisMin treatment being the baseline. In addition to these treatment dummies, all models include a constant term and the inverse of the period number, the latter to account for learning effect. Some models include statistics from the end of session questionnaire. (See Table A.4 for the description of each variable.)

The coefficients of the regressions are shown in Table A.3. Figures in parentheses are standard errors.

In our five models, the test results on the differences between treatments are similar to those under the two-tailed Mann-Whitney test using the group average efforts or the group minimum efforts: The effort level under the ConFull treatment is significantly or weakly significantly higher than that under ConMin. There are no significant differences between the ConMin, DisMin and DisFull treatments. When measured by the group minimum effort, there is no significant difference between treatments. The hardwork dummy (whether subjects report

TABLE A.3. Random Effect Panel Regression Results[a]

Dependent Variable	(1) Effort	(2) Effort	(3) Effort	(4) Effort	(5) Minimum Effort
conmin	−0.263	−0.217	−0.268	−0.294	0.317
	(0.819)	(0.790)	(0.799)	(0.769)	(0.944)
confull	0.949	1.020	0.830	0.822	1.360
	(0.818)	(0.804)	(0.804)	(0.787)	(0.953)
disfull	0.215	0.330	0.215	0.345	0.180
	(0.909)	(0.899)	(0.873)	(0.862)	(1.032)
invperiod	0.721	0.721	0.721	0.721	−0.930**
	(0.472)	(0.472)	(0.472)	(0.473)	(0.412)
hardwork			0.560**	0.628**	
			(0.261)	(0.261)	
trust			0.409	0.331	
			(0.276)	(0.274)	
risk			0.967***	1.005***	
			(0.305)	(0.299)	
quizwrong			0.039	0.085	
			(0.079)	(0.086)	
Demographics[b]	No	Yes	No	Yes	No
Constant	3.996***	4.535***	3.272***	3.974***	3.532***
	(0.748)	(1.175)	(0.777)	(1.135)	(0.822)
Observations	2400	2400	2400	2400	400
Subjects	240	240	240	240	240
R-squared	0.048	0.064	0.086	0.105	0.0647
Wald test of model (p-value)	0.121	0.062	0.001	0.001	0.133
p-value of coefficient test					
ConFull vs. ConMin	0.057	0.042	0.067	0.050	0.143
ConFull vs. DisFull	0.327	0.347	0.399	0.512	0.153
ConMin vs. DisFull	0.524	0.458	0.507	0.374	0.867

[a] Numbers in parentheses are clustered standard errors. *, ** and *** indicate statistical significance at 10%, 5% and 1% levels, respectively.

[b] See Table A.4 for details on the demographic controls. None of these variables is statistically significant in any regression.

themselves to be willing to work harder than other members on a team project) and the risk dummy (whether subjects reveals themselves to be risk-lovers in a choice of gambles) are the only individual characteristics that are significant.

TABLE A.4. Description of Variables Used in Regression

Variable Name	Description
Dependent Variables	
effort	The (average) effort in each period
min effort	The (average) minimum effort in each period
Treatment Dummies	
conmin	Equal to 1 if it is the ConMin treatment, 0 otherwise
confull	Equal to 1 if it is the ConFull treatment, 0 otherwise
disfull	Equal to 1 if it is the DisFull treatment, 0 otherwise
Learning Effect Variable	
invperiod	1/period number
Apptitude Variables	
hardwork	Equal to 1 if the subject is willing to work harder than other members when completing a team project, 0 otherwise
trust	Equal to 1 if the subject will trust a stranger, 0 otherwise
risk	Equal to 1 if the gamble game the subject wants to play indicates that s/he is a risk-lover, 0 otherwise
quizwrong	The number of quiz questions a subject gets wrong at the first attempt, indicator of the understanding of instructions
Demographic Controls	
experiment	The number of experiment the subject has participated in the past
age	Subject's age
language	Equal to 1 if the subject speaks a language other than English, 0 otherwise
economics	Equal to 1 if the subject has taken an economics course, 0 otherwise
male	Equal to 1 if the subject is female, 0 otherwise
liveau6y	Equal to 1 if the subject has lived in Australia for more than 6 years, 0 otherwise
graduate	Equal to 1 if the subject is a graduate student, 0 otherwise