



Private and Public Decisions in Social Dilemmas: Evidence from Children's Behavior

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Abstract

Substantial research with adult populations has found that selfish impulses are less likely to be pursued when decisions are publicly observable. To the best of our knowledge, however, this behavioral regularity has not been systematically explored as potential solution to social dilemmas. This paper takes a step in that direction. We report data on the self-control decisions of children aged 6 to 11 who participated in games that require one to resist a selfish impulse for several minutes in order to benefit others. In one condition children make decisions in public view of the group of other participants, while in another they can make decisions either publicly or privately. In both conditions, we allow the group size to vary. We find that children aged 9 and higher are better able to resist selfish impulses in public environments. Younger children, however, display no such effect. Further, we find self-control substantially impacted by group size. When decisions are public, larger groups lead to better self-control, while in the private condition the opposite holds. Our findings suggest that announcing decisions publicly and to large groups may be part of a solution to some social dilemmas. In addition, the fact that public decision-making promotes pro-social behavior only in older children suggests this positive effect may stem from a desire to avoid shame.

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*Nothing makes it easier to resist temptation
than a proper bringing-up, a sound set of
values - and witnesses.*

Franklin P. Jones

Introduction

Social dilemmas involve conflict between an individual's short-term self-interest and a group's ability to sustain social cooperation (Hardin, 1968). The temporal features of this conflict resemble individual self-control problems: succumbing to selfish temptations can detrimentally impact long-run individual interest (Baumeister and Heatherton, 1996 and Loewenstein, 1996). Moreover, in both contexts, even recognizing the long term benefits does not prevent one from succumbing to selfish impulses. In view of these similarities, scholars in economics and psychology have recently investigated relationships between cooperation in social dilemmas and self-control (see, e.g., O'Donoghue and Loewenstein, 2007; Sheldon and Fishbach, 2011; Seely and Gardner, 2003).¹

¹ Martinsson et al. (2010) find that conditional cooperation is stronger when expectations of high contributions are accompanied by a high level of self control. Among the psychologists, Dewitte and De Cremer (2001) investigate the relationship between self control and cooperation evidencing three important factors which are able to facilitate

Public environments enhance one's ability to exercise self-control, and selfish temptations are more likely to be acted on under anonymity (see, e.g., Hoffman et al., 1994 and 1996). To the best of our knowledge, however, this behavioral regularity has not been systematically explored as potential solution to social dilemmas. Our goal with this paper is to take a step in this direction. Doing this seems important, in part because it is often easier to control a person's environment than to control their decisions.

This paper investigates the self-control decisions of children in a social dilemma. Self-control in children is a topic that has received decades of scholarly attention (for a survey, see Bucciol et al., 2010). In the environment we study, a group is made better off if all children within the group are able to avoid individual selfish temptations. Each child, however, is better off succumbing to temptation. We compare children's ability to exercise self-control between conditions where their decisions are publicly observable to other group members and when they are not. The advantage to using children of these ages is that we are able to compare decisions of children aged nine years or younger to older children that are typically able to engage in theory of mind reasoning.² In doing this we are able to provide insight on the mechanism underlying any positive impact of public environments.

Our first hypothesis is that older children (aged nine or older) will display increased self-control in public environments, while younger children will not. The reason is that older

self control as well as enhance cooperation: group identification, self-efficacy and mutual trust. Curry et al. (2008) show that discount rate is negatively correlated to public good contributions.

² Leman et al. (2008) show that 7-years old children are not able to differentiate between ultimatum game and dictator game offers. Starting from the age of 9-10, the offers made in the ultimatum game increase with age (Leman et al. (2008) , Harbaugh et al., (2003)).

children, as a consequence of their ability to employ theory-of-mind reasoning, are more likely to believe that their group members will perceive them negatively if they succumb to a selfish temptation. The desire to avoid this feeling of “shame” is likely to be less pronounced in younger children.³

In addition to our key comparison between public and private environments, within each condition we also vary the group size. Our second hypothesis is that group size impacts behavior differently in public than private decision contexts. In particular, when decisions are public behaving selfishly to many is “more shameful” than behaving selfishly to a smaller number. Consequently, larger groups in public decision environments should better deter selfishness. On the other hand, in private contexts one may be more concerned that other group members will be more likely to succumb to temptation. Consequently, children in larger groups may be more likely to succumb to temptation more quickly, and this might be especially true of older children who are better able to engage in strategic reasoning.

Our data clearly support our hypotheses. We find older children are in all cases more able to exercise self-control than younger children, in the sense that they are able to wait longer, on average, before acting selfishly. Moreover, older children are able to wait significantly longer when decisions are public than when they are private. Young children, on the other hand, demonstrate little differences between conditions. Further, we find the larger groups indeed encourage self-control among older children in the public conditions, while this effect is absent among younger children and when decisions are made in private.

³ Ferguson et al, (1991) find that younger children (aged 7-9) associate shame with embarrassment, blushing, ridicule, and escape, while children age 9-11 additionally characterized shame as including more severe feelings such as feeling stupid, being incapable of doing things right, and not being able to look at others.

These findings are important. They suggest that announcing decisions publicly and to large groups may be a step towards promoting cooperation in some social dilemma environments, especially those where delay of gratification plays an important role. More generally, the avenue towards promoting cooperation that we suggest requires intervention only at the level of the social decision environment. Such an approach might have distinct efficiency advantages over alternatives (e.g., monitoring and enforcing sanctions) that require costly interventions at the individual level (for a related argument see Xiao and Houser, 2011).

The remainder of this paper is organized as follows. In section II we present our experiment design, our procedures and also detail our hypotheses. Section III reports our data, both in summary form as well as through regression analyses. Section IV offers a concluding discussion.

II. Experiment

We conducted the experiment during the period November 2010 - May 2011 in 22 classes (across 8 schools) in the district of Treviso (Italy). A total of 406 children aged between 6 and 11 years old participated in our study. 50.90% of the participants are male and this proportion is almost constant across treatments. The size of the groups participating in the experiment in each class is on average 17.69 (minimum 12, median 16, and maximum 26). The actual number of children participating in the experiment varies in each class according to the

number of children who are present and eligible to participate (parents have provided signed consent) on the day of the experiment⁴.

At the beginning of the experiment children received 5 colored bracelets (called *silly bandz*⁵, see Figure 1) for participating. These silly bandz are placed over each child desk.

Figure 1. Colored bracelets (*Silly bandz*).



Children were told that if all of them waited patiently for 10 minutes in silence, without touching and opening the transparent package with the silly bandz, they would each receive 5 additional silly bandz. However, if one child (or more) stops the time raising his/her hand, then only this child would receive the additional 5 silly bandz, and the others would receive nothing

⁴ The average size of the class participating in the experiment is 19.48 (min 14, median 19, max 27), which means that in average two children per class were not participating to the experiment either because they were absent or they did not had the parents' permission. In the last case they were assigned to alternative activities.

⁵ These bracelets are highly desired among children of the ages in our sample. Different colors and shapes make them to both genders and across our sample's ages.

beyond the initial 5 silly bandz. Figure 2 reports a picture taken during a pilot session of the experiment.

Figure 2. Children in class waiting (a) and a child raising her hand (b).



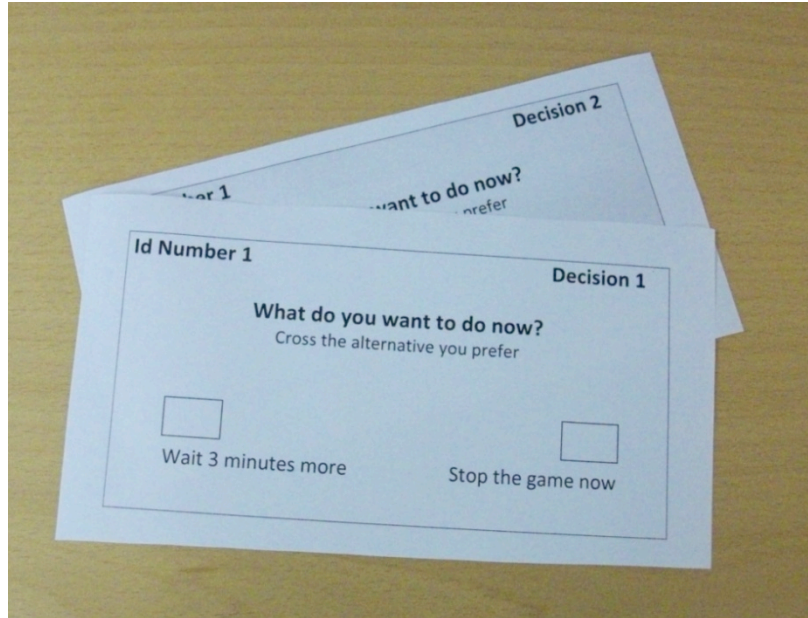
(a)



(b)

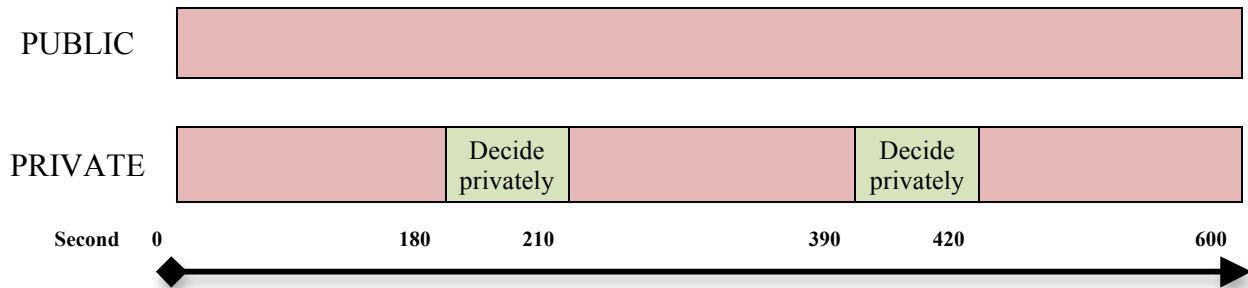
Our experiment has two main treatments. In Public Treatment the decision to stop the time must be taken in view of all the other children. In Private Treatment, we gave children the additional possibility to stop the time privately. In this treatment children have two windows of 30 seconds each - one after 3 minutes and one after 6 minutes - during which they were able to stop the time secretly. They did this by privately marking a report sheet that had been previously distributed by the experimenter (see Figure 3). The children's report sheets were collected by the experimenter after three and six minutes (if the game had not stopped) and checked immediately following collection. If one child or more had decided to stop then the entire class was informed that the game had ended, but we did not reveal the identity of the one(s) who chose to stop the time.

Figure 3. Report Sheets used in Treatment Private (translated in English)



Therefore, both children in Private and in Public have to wait in total for 10 minutes to have the 5 additional silly bandz. It is important to note that children in Private are also able to stop the time in view of others by simply raising their hand. Figure 4 describes the timing of each of our two treatments.

Figure 4. Timing of our two main treatments.



In both treatments, in case more than one child stopped the time we used a random device to allocate the 5 additional silly bandz. The Appendix provides more information about the experiment as well as a transcript of the instructions and script we used.

In addition to these two main treatments, we have run a Guessing Treatment in which we elicit beliefs by asking other children to guess what happened during a session of the experiment with children of their age. More in detail, we described the task that children faced in Public or Private treatment and then we asked them to guess if anyone stopped the time and, eventually, how many children stopped the time. If children guess correctly they earn 10 silly bandz in addition to 2 silly bandz for participating.

With this design we want to test the following research hypotheses:

1. Younger children will demonstrate less ability to wait than older children both in all conditions. The reason is that it is well established that the ability to delay gratification develops with age (see, e.g., Mischel and Metzner, 1962).
2. Older children will demonstrate a greater ability to wait in the public than private treatment. The reason is that older children may want to avoid the shame of appearing selfish, greedy or impatient.
3. For older children, the effect of group size on the waiting time will be positive in the public treatment and negative in the private treatment. The presence of an additional group member represents an additional threat to stop the game. Consequently, stopping the game quickly, before another can do so, becomes a more attractive option. This reasoning is offset in the public treatment, however, by the fact that additional group member represents also an additional person to feel negatively towards the one who

stopped the game. “Shame” may outweigh the “threat” effect, leaving stopping the game a less attractive option in larger groups.

4. We do not expect any difference in public and private treatment for younger children since they are not affected by the presence of others. At the same time we do not expect any effect of group size for young children.

III. Results

Table 1 shows that gender and age distribution of our sample are balanced across treatments (Gender: Chi-square tests: p-value = 0.758; Age: Fisher's exact test, p-value = 0.448)

Table 1. Distribution of age and gender across treatments (in %)

Age	TR 1 “Public”			TR 2 “Private”		
	Total (N=135)	Boys (N=70)	Girls (N=65)	Total (N=142)	Boys (N=71)	Girls (N=71)
First Grade	11.9	12.9	10.8	10.0	10.0	10.0
Second Grade	16.3	11.5	21.5	21.1	21.1	21.1
Third Grade	16.3	17.1	14.4	21.1	16.9	25.3
Fourth Grade	29.6	27.1	32.3	26.7	29.5	23.9
Fifth Grade	25.9	31.4	20.0	21.1	22.5	19.7

In the following analysis we divide our sample into “young” and “old” children using the median grade (which corresponds to the age of 9 years). Table 2 reports the number of

participants and classes (in parenthesis)⁶. The distribution of old and young children obtained in this way is balanced across treatments (Chi-square test, $p = 0.202$) and across genders (Chi – square test, $p= 0.210$).

Table 2 Number of participants (# of classes within parenthesis)

	Public	Private	Tot.
Young (I, II and II grade)	60 (3)	74 (5)	134 (8)
Old (IV and V grade)	75 (4)	68 (4)	143 (8)
Tot.	135 (7)	142 (9)	277 (16)

The mean of the groups of children participating the experiment is 19.3 (min=15 max=25 and median=19) in treatment public and 15.9 (min=12, max =20 and median=15) in treatment private. The difference is slightly significant (Mann-Whitney, $p=.055$)⁷.

In the next sections we present our main results. First, we analyze the average waiting time and the ability to resist over time at group level (section III.1). Second, we present the result

⁶ Our results are unchanged when using size of the participating groups rather than class sizes. Since the children were participating to the experiment in their classes, we look at the grade rather than to the age. However, when considering age, the only difference in Table 3 is for Public: we have 61 children younger than 9 years (rather than 60) and 74 children from 9 to 11 years old (rather than 75).

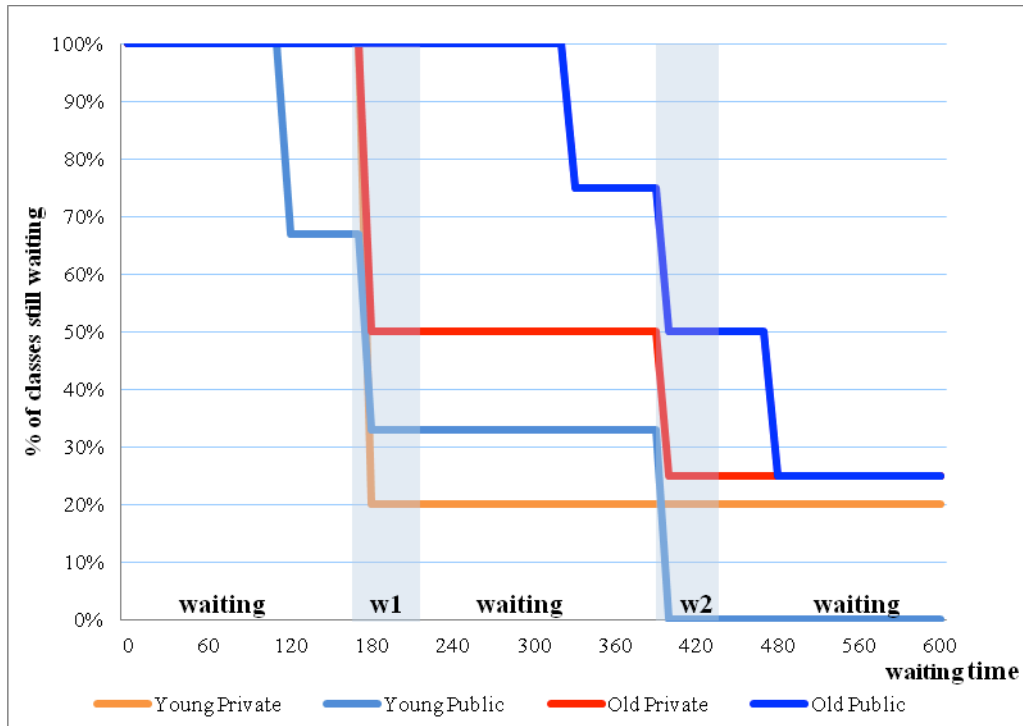
⁷ Class sizes are not statistically different between treatments (Mann-Whitney test, $p\text{-value}=.5191$). The average class size in Public is 19.7 (min=15, max=26 and median=19), while it is 18.7 in Private (min=15, max=23 and median=17).

of the belief elicitation task in the guessing treatment (section III.2.). Third, we study the decision to stop the time and the length of time spent waiting at individual level (section III.3).

III. 1 Waiting Time and Timing of the Stopping decision in groups.

The average waiting time for young children is rather similar in our treatments (240 seconds in Public vs. 264 seconds in Private). Old children wait more (457 seconds in Public and 337 in Private). It is interesting to notice the evolution over time of this stopping decision and the differences between treatments and age. Figure 5 reports this evolution over the 600 seconds of our experiment. This figure shows that in both treatments, groups of young children stop sooner. Moreover, there is a difference between Private and Public, with older children in Public waiting longer before stopping the game.

Figure 5. Percentage of Groups That Remain Waiting Over Time



III.2 Belief Elicitation

In the guessing treatments, we ask other children to predict the behavior of the children who participated in our experiment. We elicited beliefs of only “old” children because this task is too complex for young children.

Figure 6. Responses to the Question: “How many children will stop the game?”
Responses in Percentages

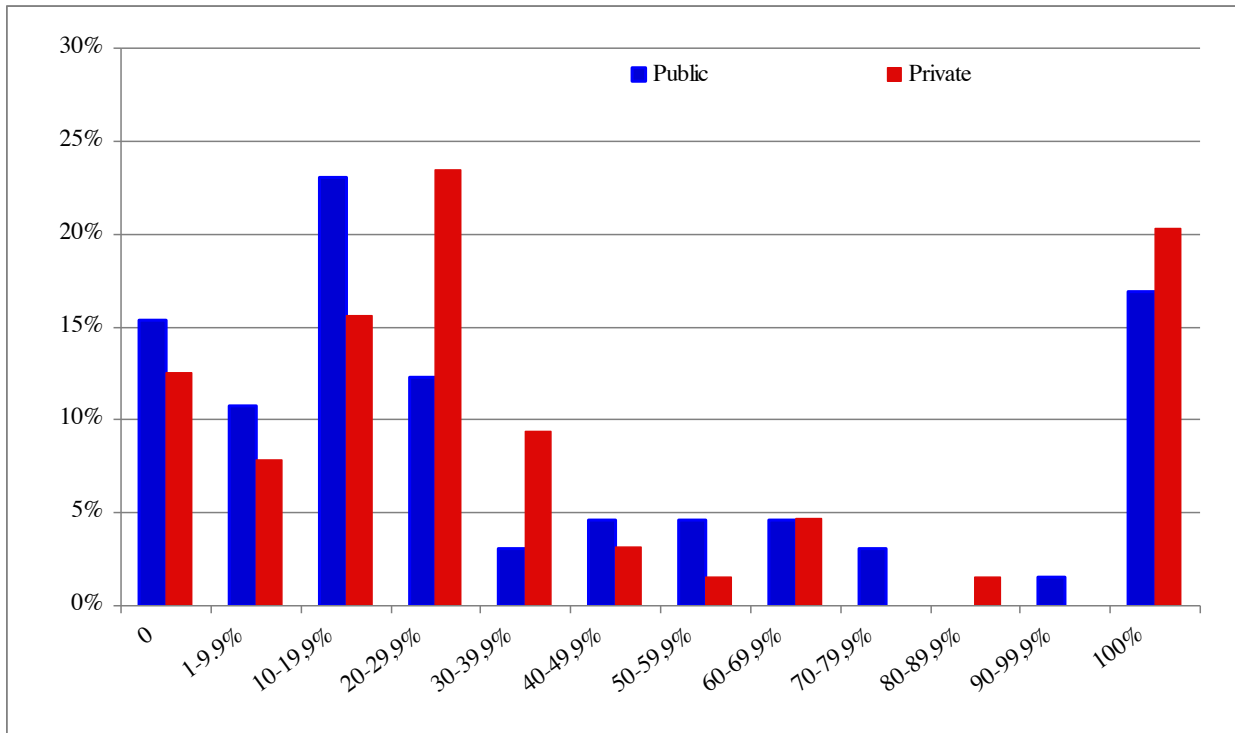


Figure 6 shows the distribution of beliefs about stopping times. We find that children are able to anticipate that in Private treatment a higher percentage of children stopped the time. In fact, the distribution of Private treatment lies to the right of Public treatment. This means that children are able to anticipate that in private treatment the selfish decision is less “costly” than in the public treatment and therefore expect more children stopping the game. In addition, comparing the distributions of the guess about the percentage of children stopping the game

across treatments, we find that beliefs regarding the percentage of children who stopped the game in Public are lower than we find in Private (Kolmogorov-Smirnov, one sided, p-value=0.082)⁸.

In summary, we have shown that groups of older children are able to wait longer. Second, when these older children have to make their decision in front of others they can wait even more. Third, other children are able to predict this behavior of children of the same age and therefore form correct beliefs. Now, we are in the position to study more in detail the behavior at the individual level.

III.3 Individual Behavior: Regression Analysis

In this section we inform our hypotheses by analyzing self-control at the individual level. In the models (1)-(7) contained in Table 3 we estimate a set of logistic regressions⁹ which use as dependent variable a dummy variable taking value 1 if the child stopped the game, and 0 otherwise. As explanatory variables we include treatment using the dummy private (equal to 1 if treatment is private and 0 otherwise), group size, gender (equal to 1 if the child is male) and an age dummy¹⁰ “old” (equal to 1 if the child is in the 4th or 5th grade, and 0 otherwise). In addition, we account for the interaction between age, group size, treatments and gender.

⁸ Note that children are first informed about the number of children participating the session for which they have to make the guess. Therefore we can express the guess for each child as a percentage.

⁹ Using Probit models generates the same results. Results available upon request.

¹⁰ All our findings are robust to using grade or age rather than age groups. Results available upon request.

Table 3. Decision to stop the game

Dependent Variable <i>Stop game</i> (=1 if the child stops the game, 0 otherwise)							
	Logistic Regressions					Multilevel mixed-effects logistic regression	
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Old	-2.26*	-2.58*	-.54	-2.58	-0.54	-1.07**	-1.12
	(1.18)	(1.36)	(2.39)	(2.39)	(3.01)	(.48)	(3.39)
Private	2.35**	-7.84***	2.39**	-7.84***	2.39*	-7.72**	-7.73**
	(0.99)	(2.37)	(0.96)	(0.84)	(1.34)	(3.41)	(3.46)
Group size	0.24**	-0.07	0.28**	-0.07***	0.28	-0.07	-0.07
	(0.12)	(0.08)	(0.13)	(0.01)	(0.26)	(0.13)	(0.15)
Male	0.41	0.43	0.42	0.43	0.42	1.08**	1.08**
	(0.46)	(0.50)	(0.46)	(0.80)	(0.75)	(0.48)	(0.48)
Old*Male	1.99	2.05	1.96	2.05	1.96	-	-
	(1.46)	(1.53)	(1.46)	(2.62)	(2.56)		
Private*Group size	-	0.53***	-	0.53***		0.52***	0.52***
		(0.13)		(0.05)		(0.18)	(0.18)
Old*Group size	-	-	-0.09	-	-0.09***	-	0.00
			(0.09)		(0.02)		(0.18)
Constant	-8.06***	-1.55	-8.84	-1.55*	-8.84*	-1.92	-1.90
	(2.78)	(1.55)	(2.79)	(0.81)	(5.12)	(2.61)	(3.06)
Observations	277	277	277	277	277	277	277
Wald chi2	10.38	66.55	17.18	-	-	25.51	25.52
Prob > chi2	0.0650	0.0000	0.0090	-	-	0.001	0.0003
Pseudo R-squared	0.1429	0.1933	0.1455	0.1933	0.1455	-	-
Log pseudolikelihood	-73.93	-69.58	-73.71	-69.58	-73.71	-71.31	-71.31
Random effect parameter							
Private	-	-	-	-	-	4.60e-08	4.83e-12
						(.2222534)	(.222253)
Session	-	-	-	-	-	3.63e-09	1.23e-13
						(.3419029)	(.3417924)

Note: Dependent variable: *Stop game* (=1 if the child stops the game, 0 otherwise). Estimation methods: (1)-(5) Logistic regression. Estimation methods: (6)-(7) *Multilevel mixed-effects logistic regression*. Models 1-3: Robust Standard errors clustered on 16 groups, standard error in parenthesis; Models 4-7: Robust Standard errors clustered on 2 treatments, standard error in parenthesis.

***=significant at 1%; **= significant at 5%; *=significant at 10%.

The seven models we estimate vary in their controls and error structure. Consequently, the specific results of each analysis vary. Taken together, however, our analyses provide compelling and robust evidence of significant effects of age, public or private treatment, and group size on

the ability to exert self-control, and in a way that is consistent with our above-stated hypotheses.

In particular, three conclusions that can be drawn from our analysis are as follows:

1. age significantly reduces the probability of stopping the game;
2. being in the private treatment increases the probability of stopping the game compared to the public treatment;
3. group size has a positive effect (reducing the probability of stopping the game) in the public treatment, but a negative impact (increasing the probability of stopping the game) in the private treatment.
4. We start our analysis from models (1)-(3), containing results from a set of Logistic regressions in which standard errors are clustered at the level of the group (i.e. our 16 classes).

In model (1) we include as explanatory variables treatment, age, gender, group size and the interaction between age and gender. In model (2) we add to the specification of Model (1) the interaction between group size and treatment, while in model (3) we introduce an interaction between age and group size while eliminating the interaction between treatment and group size.

Being an “old” child reduces significantly the probability to stop the game both in model (1) and (2). In model (3), once we introduce the interactions: “Old*Male” and “Old*group size”, the age effect vanishes. In all these three models, the treatment variable Private is significant. In model (1) and (3) it has a positive effect on the probability to stop the game, while in model (2), once we introduce the interaction “private*group size”, it shows a negative effect while the interaction has a positive and significant effect. Therefore, we find support that the joint effect of being in treatment private and having an additional group member raises significantly the probability to stop the game compared to treatment public. Finally, in both model (1) and (3) we

find evidence of a positive and significant effect of group size on the probability to stop the game.

Our three main findings are confirmed also when looking to the remaining models. Models (4)-(5) are identical to models (2) and (3) respectively, except that errors are clustered by treatment rather than by class. Our main results are again confirmed, with the exception that age fails to achieve significance. In model (4), group size has a negative and significant effect while the interaction “private*group size” has a positive and significant effect. In model (5) we add to the explanatory variables the interaction “old*group size”, while eliminating the interaction between private and group size. The interaction “age*group size” is negative and significant, while group size fails to achieve significance.

Finally, in models (6)-(7) we report results from two multilevel mixed-effect logistic regressions with variance decomposed between treatments and classes. Model (6) suggests that males have a significantly higher stopping probability than females. Older children, instead, have a lower probability of stopping the game, as do children in the Private treatment. Group size is insignificant, while the interaction “group size*private” has a positive and significant effect. In model (7) we introduce the interaction “old*group size”. As a consequence, age fails to achieve significance. Other results are unchanged with respect to model (6).

IV. General Discussion

We studied children aged 6 to 11 years who participated in a novel social dilemma experiment. Our design adapts the “Marshmallow experiment” to groups: children receive a prize that doubles if they can all wait together for 10 minutes. However, if only one child fails to resist then only his or her prize doubles. We analyze behavior under two conditions: “Public” in which the

decision to stop visible to all participants and “Private” in which the decision can be taken privately. We find that children aged 9 and higher are better able to resist selfish impulses in public environments. Younger children, however, display no such effect. Further, we find self-control substantially impacted by group size. When decisions are public, larger groups lead to better self-control, while in the private condition the opposite holds.

We pointed out that the advantage to studying children aged 6-11 is that children aged 9-11 have a more sophisticated understanding of the way they are perceived by others, and in particular are more sensitive to shame than younger children. This enables us to shed some light on the reason that public environments inhibit selfish decision making. We argued the fact that public decision-making promotes pro-social behavior only in older children suggests it is due to a desire to avoid being perceived negatively by others. Our data seem specifically to rule out the possibility that longer wait-times in the public treatment are due to implicit threats of punishment or other forms of retaliation, which would inhibit selfishness at all ages.

Research on promoting cooperation using mechanisms that require intervention with monetary incentives at the individual level (e.g., punishment and reward) comprise the vast majority of the social dilemma literature. This paper takes a different tack by investigating whether cooperation can be promoted by changing the social decision environment in the absence of changes to monetary incentives. Our findings suggest that ensuring decisions are publicly available to large groups may indeed be an important part of a solution to some social dilemmas. In future research we intend to explore how monetary and social incentives might be combined in order to achieve increased prosocial decisions in charitable giving environments.

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Appendix

A.1. Waiting Time

In our contexts, an alternative way to study children ability to resist is to analyze the time they are able to wait in both conditions. Here we report results from regressions investigating how waiting time is impacted by treatment (public or private), group size, age group and gender. Our dependent variable is waiting time, measured in seconds. Table A1 reports our results.

Model (1) reports an OLS regression. We include among the independent variables gender, age group, treatment and two interactions: group size with treatment and group size with age group. The only significant coefficient is associated to “old”, which increases significantly the waiting time. In model (2) and model (3) we conduct OLS regression respectively for private and public treatment. Results are similar. Finally in model (4) we estimate a GLS regression. Being in the age group “old” reduces significantly the waiting time, even if the interaction between gender and age has a positive and significant effect. An increase in the group size significantly reduces the waiting time while the interaction between the gender and the group size affect positively the waiting time.

Table A1. Waiting time

Dependent Variable	Waiting time (=number of second that the child was able to resist, it goes from 0 to 600)			
	OLS			GLS
Method	(1)	(2)	(3)	(4)
Old	158.77** (71.34)	74.14 109.16	240.87** (79.65)	-355.74*** 85.82
Private	151.35 (414.30)	-	-	-
Group size	-4.91 (10.74)	-12.66 18.5	-3.79 11.7	-49.79*** (4.69)
Male	-5.33 (13.87)	-14.72 14.64	12.89 18.75	.36 (18.81)
Old*Male	31.51 (18.26)	54.59** 17.76	1.33 25.60	3.3 (20.34)
Private*Group size	-13.39 (23.11)	-	-	-
Old*Group size	-	-	-	34.81*** 4.85
Constant	361.23 (229.8)	460.16 331.7	293.13 272.07	1216.24*** 5.46
Observations	277	142	135	277
F	(6,15) 3.48	(4,8) 4.27	(4,6) 6.96	(5, 129) 100.69
Prob> F	0.0234	0.0387	0.0194	0.000
R-squared	0.2869	0.0834	0.5734	0.7960
Adj R-squared	-	-	-	0.7881
Root MSE	147.11	170.95	108.13	41.045

Note: Dependent variable: *Waiting time in seconds (from 0 to 600)*. Estimation methods: (1)-(3) OLS regression. Estimation methods: (4): GLS regression. Models 1-3: Models 1: Robust Standard errors clustered on 16 groups, standard error in parenthesis. Model 2: Robust Standard errors clustered on 9 groups, standard error in parenthesis. Model 3: Robust Standard errors clustered on 7 groups, standard error in parenthesis.

***=significant at 1%; **= significant at 5%; *=significant at 10%.

A.2. Experimental Instruction

We report here the experimental instruction.

Stage 1: Greeting and introductory instructions for the group.

Hello everybody! First of all, thanks for letting us come to your school today. It's really nice to be here with you. Did you like the lecture? What did you learn today? (We also ask other questions, just to familiarize ourselves with children).

Today you have the chance to win one of these two prizes.

The assistant shows them the two prizes.

Please do not talk, and try to listen what we will tell you over the next few minutes. It is really important you understand the rule of this simple game. If you have any questions, please raise your hand, and we will answer your questions. If you do not want to play the game, please tell us. You do not have to participate if you do not want to. We will ask you to remain seated at your desk and wait until everybody has finished.

Stage 2: Identification and consent form collection

Before starting the experiment, the experimenter says (individually):

You do not have to join this study. It is up to you. You can say okay now and change your mind later. All you have to do is tell us you want to stop. No one will be mad at you if you don't want to be in the study or if you join the study and change your mind later and stop. Do you want to participate?

Since this is our first time here, and we do not know your name, we need to give you a tag with a number on it. The tag is attached to a string that you can wear around your neck. The number on the tag has no meaning. However, please do not lose it or remove it, because we will record your choices using this number, and you must return the tag when the game is over to receive a prize.

Here we have a plastic bag with some cards. Each card has a number. My assistant is going to come by, and you can pick a card. Once you have a number, you have to go to that table [*show where the table is with hand*], tell your name and then get your tag with the same number. During the game, we will use these numbers to identify you, since we do not know your names.

The assistants assign a tag to each child whose name is in the list of approved participants, corresponding to the number drawn. Once everybody has a tag, we continue with the instructions. At the same time assistants collect all the consent forms and questionnaires.

Stage 3: Instructions

(Treatment Public).

Here we have two different prizes A and B. A is really great, isn't it? We will distribute prize A to everybody but you will have to wait for 10 minutes. Thus, you have simply to wait in silence at your desk for ten minutes and you will receive the prize A. A clock will appear on the screen to help you to figure out how many seconds and minutes remain to wait.

However, if you think you cannot resist, you can simply raise your hand and we will give you immediately prize A. The bad news is that if you raise your hand your class-mates will not receive A but only B. So, before raise your hand consider carefully the consequences of your action. In case more than one of you raises his/her hand at the same time we will randomly assign prize A.

(Treatment Private).

Here we have two different prizes A and B. A is really great, isn't it? We will distribute prize A to everybody but you will have to wait for 9 minutes. Thus, you have simply to wait in silence at your desk and you will receive the prize A.

However, if you think you cannot resist, you can simply raise your hand and we will give you immediately prize A. The bad news is that if you raise your hand your class-mates will not receive A but only B. So, before raise your hand, consider carefully the consequences of your action. In case more than one of you raises his/her hand at the same time we will randomly assign prize A.

This game has three stages of three minutes each:

After the first 3 minutes, I will stop the time and you are asked to decide if you want to stop the game or if you want to continue for other 3 minutes. You have to take this decision privately, by crossing one of the alternatives in this decision sheet (show them): stop or wait. Then, we will collect all the decision sheet and we will check your decision. If one kid indicated that he or she want to stop, the game will end for everyone. As previously said, we will give him or her Prize A whereas all the other will receive Prize B. This prize distribution will be done privately at the end of the experiment.

If more than one person indicated s/he do not want to wait, the game will end for everyone as well and then we randomly select one those who decided not to wait and we will give her/him Prize A.

If you all indicated you want to wait, then I will let you wait for 3 minutes more. After these 3 minutes I will stop again the time and you are required to decide what you want to do as before. In this case you have to fill another decision sheet exactly as before. The rules are the same as before (repeat?)

Finally, if also this time everyone decided to wait, I will let you wait for the last 3 minutes and then, if still none raises his/her hand, I will give Prize A to everyone.

(Treatment Guessing).

For children in treatment Guessing we describe the task that other children faced in treatment Public or in treatment Private and we ask them to guess how many children have stopped the time. In case they guess correctly they win 10 silly bandz. As show-up fee we gave 2 silly bandz to each child for participating.

All Treatments

Experimenter asks some quick questions, to check the children's comprehension of the instructions, and the payoff implications.

Experimenter answers possible questions, or requests to repeat part of the instructions.

Are you ready? So, let's start!

The experiment starts

Stage 4: Prizes distribution and farewells

Thank you very much children. Now, one by one and respecting the order of your number stop by our desk and we will give you your prize.

Experimenter and assistants distribute the prizes and ask children to return the number tag.

A.3 Recruitment of the children

Parents were informed of the opportunity for their child to participate in this experiment, and asked to provide signed consent for their child's participation¹¹. At the beginning of each session, the experimenter gave each child a number to be used as an ID throughout the study, and attached a sticker with this ID each child's apron. Next, the experimenter explained the rules of the game, and asked children not to communicate with one another until the experiment ended. At this point the experimenter answered any questions and clarified the task as necessary. Teachers assisted the experimenter in maintaining silence and children's focus.

¹¹ Children provided oral assent prior to each session, and could choose not to participate at any point during the experiment. No child refused to participate, and children not eligible to participate were given alternative activities. IRB approval was provided by the Committee on the Use of Human Subjects of Harvard University (Application Number: F19883-101).