Social Strategic Ignorance in Children and Adults: 
Altruism and Selfishness *

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Abstract

We conduct a dictator experiment with children and adults. Prior to choosing the sharing rule, our participants can manipulate their access to information and remain strategically ignorant of the payoffs associated to some or all of the alternatives. Information avoidance is infrequent (11.2% of the trials) and occurs for two opposite motives: some individuals –mainly adults– use it as a commitment to remorseless selfish behavior (they look only at their payoffs and maximize them) whereas some other individuals –mainly young children– use it as a commitment to behave generously (they look only at the other person’s payoffs and maximize them).

Keywords: laboratory experiment, developmental economics, strategic ignorance, other regarding preferences.

JEL Classification: C91, D91.

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1 Introduction

Giving behavior and other regarding preferences in adults have received substantial attention in the literature in behavioral (Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000) and experimental economics (surveyed in Camerer (2003)). A few recent studies also indicate that they develop gradually over childhood and adolescence\(^1\) and that generosity in children is mediated by social interactions.\(^2\) It is however still unclear whether non selfish behavior manifests as a result of true underlying preferences or contextual demand effects. In particular, some experimental research suggests that participants in dictator games act more selfishly when they can avoid making a dictator’s choice (Dana, Cain, and Dawes, 2006). Taken together, the findings point to the existence of interactions between psychological factors related to image (both self and social) and behavior. In a context where options and choices are common knowledge, subjects may decide to appear more generous compared to contexts where hiding is possible.

The objective of this study is to investigate to which extent children and adults are willing to manipulate their access to information and remain ignorant about the social implications of their allocations. To our knowledge, Dana, Weber, and Kuang (2007) is the seminal contribution to this experimental literature. The authors show that a large fraction of participants in a dictator game are willing to remain strategically ignorant to avoid feeling guilty about their selfish behavior. The results have been replicated (Larson and Capra, 2009) although it has also been pointed out that they are sensitive to psychological manipulations (Grossman, 2014). Our paper introduces two main novelties into this literature. First, we consider an extended design with several sharing possibilities (four trials with three options of “money for me and money for my partner” in each), where subjects decide which payoff boxes to reveal before making their choices. This methodology allows for a wider array of social strategic ignorance options, that include but go beyond the “moral wiggle room” emphasized in the literature. Also, it is arguably less transparent in the demand for ignorance. Second, we analyze the choices of participants from 7 years of age to adulthood in an attempt to unveil developmental changes in the strategic use of social ignorance.\(^3\)


\(^2\)See Houser, Montinari, and Piovesan (2012); Chen, Houser, Montinari, and Piovesan (2016).

\(^3\)There is a literature on strategic ignorance. It mainly focuses on commitment devices to increase one’s payoff in individual choice settings subject to self-control (see the theory proposed by Carrillo and Mariotti (2000), further developed by Bénabou and Tirole (2002) and experimentally tested by Brown, Croson, and Eckel (2011)). Another strand studies multi-agent situations with conflicts of interests (Brocas and Carrillo, 2007). None of these papers analyzes strategic ignorance for other-regarding concerns.
The first result in the paper is that in only 11.2% of the trials, subjects open a subset of the six payoff boxes. Therefore, although ignorance is sometimes used, contrary to Dana et al. (2007) and Larson and Capra (2009), it is not heavily favored. This is in support of Grossman (2014) who argues that the default technology, and more generally the experimental procedure, influences the likelihood of remaining ignorant. We conjecture that a design such as ours where the distribution of payoffs (i.e., the possible values inside the boxes) is unknown to subjects, significantly increases the incentives to learn.

Second, within the trials where participants do not become fully informed, we observe social strategic ignorance both for selfish and altruistic motives. Indeed, while some subjects look only at the “money for me” boxes and choose the option that maximizes their own payoffs, others look only at the “money for my partner” boxes and decide to maximize the partner’s payoff. In other words, a (small but positive) fraction of subjects use ignorance as a commitment for generosity. Third, information avoidance is used differently across different age groups. In our sample, most of the selfish strategic ignorant subjects belong to the control adult population whereas most of the altruistic strategic ignorant subjects belong to the youngest population, the children between 7 and 9 years of age. Children and adolescents between 10 and 16 years old rarely use this mechanism. Finally, we also observe an interesting behavioral evolution from childhood to adulthood: in a trial where the subject receives always 4 tokens but must choose between 0, 4 and 8 for the partner, the first option is favored by young children, the second by older children and adolescents and the third is favored by adults.

2 Design and procedures

The experiment was reviewed and approved by the IRB of the University of Southern California. It was conducted through tablet computers and the tasks were programmed with the open source software Multistage (http://multistage.ssel.caltech.edu). Participants responded to the task by tapping on the screen. The software recorded the information attended to before making a choice, as well as the final decision.

We recruited 220 children and adolescents from 2nd to 10th grade at the Lycée International of Los Angeles (LILA), a bilingual private school in Los Angeles, with campuses in Los Feliz (pre-K to 5th) and Burbank (6th to 12th). We ran 28 sessions, each with 8, 10 or 12 participants. Sessions were conducted in a classroom at the school. For each session, we tried to have all participants from the same grade, but for logistic reasons we sometimes had to mix participants of two consecutive grades. High schoolers from 9th, 11th and 12th grade did not participate in the study because they were taking or preparing for French or US national exams during this period. For comparison, we recruited 70 students at
the University of Southern California and we ran 6 sessions at the Los Angeles Behavioral Economics Laboratory (LABEL) at USC. For the college population, participants were recruited from the LABEL subject pool. A description of the distribution of our participants is reported in Table 1. For our analysis, we group the school kids in 4 age-categories (C1, C2, C3, C4). The undergraduates (U) constitute our control group (C5).

<table>
<thead>
<tr>
<th>Location</th>
<th>LILA Los Feliz</th>
<th>LILA Burbank</th>
<th>USC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age-category</td>
<td>C1</td>
<td>C2</td>
<td>C3</td>
</tr>
<tr>
<td>Grade 2nd</td>
<td>33</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>3rd</td>
<td></td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>5th</td>
<td></td>
<td></td>
<td>33</td>
</tr>
<tr>
<td>6th</td>
<td></td>
<td></td>
<td>24</td>
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<tr>
<td>7th</td>
<td></td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>8th</td>
<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>10th</td>
<td></td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

Table 1: Participants by grade and location

Tasks. Participants completed 4 trials of the “social card game”, a three-option dictator game, performed in a counterbalanced order in each age group. Trials had identical rules but different payoffs. In each trial, each participant had to choose one card among three. Each card contained two numbers. The number at the top represented the payoff for the participant (the dictator). The number at the bottom represented the payoff for one other participant randomly and anonymously drawn from the pool of participants in the session (the recipient). In each trial, we drew a new recipient for each dictator. Participants did not receive any feedback between trials. They learned only the total amount accumulated throughout the four tasks (their four choices as dictators and the four amounts received as recipients) and only at the end of the experiment. They never learned the identity of participants with whom they were matched. Instructions can be found in Appendix A.

The only novelty relative to the existing experimental literature on altruism and other regarding preferences is that payoffs were hidden behind opaque boxes. Participants could disclose these values one by one simply by tapping on them. This technique has been successfully employed to understand decision processes in different game theoretic contexts, including backward induction (Johnson, Camerer, Sen, and Rymon, 2002), dominance solvable (Costa-Gomes, Crawford, and Broseta, 2001) and asymmetric information (Brocas, Carrillo, Wang, and Camerer, 2014). The procedure had no cost except for the (negligible) effort of tapping on a box. Participants were clearly instructed that in each task the number at the top was the payoff for themselves and the number at the bottom was the payoff for the other so, if they wished, they could strategically decide not to open one or more boxes. This information was also visually apparent with a hand pointing

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4The vast majority of students at LILA go to well-ranked colleges in North America and Europe, so it is a reasonable match for USC, despite the obvious differences in backgrounds, size of school, etc.

5Crawford (2008) and Willemsen and Johnson (2011) have detailed surveys of this literature.
inwards for “own payoff” and a hand pointing sideways for “other payoff”. To avoid problems of recall, once a box had been tapped it remained open. After each trial, three new cards appeared with the new payoffs hidden behind opaque boxes. Subjects could again reveal the content of the boxes and had to choose one card. Figure 1 provides screenshots of one task at the beginning of the game with all payoffs hidden behind opaque boxes (a) and during the game when some payoffs have been revealed and some remain hidden (b). The screenshots also show the hands pointing inwards and sideways, and the buttons they had to press for choosing a card. The bottom picture (c) shows the payoffs in tokens of the three cards A, B, C in the four tasks 1, 2, 3, 4.

![Screenshot: all payoffs hidden](image1)

![Screenshot: some payoffs hidden](image2)

![Payoff combinations in the four tasks.](image3)

**Figure 1:** Social card game

The tasks feature different combinations of (i) selfish allocations, where the participant gets significantly more tokens than the partner, (ii) fair and/or efficient allocations and (iii) altruistic allocations, where the participant gets significantly less tokens than the partner. We opted for three (rather than two) cards to include some subsets of combinations that differ only in the amount of tokens for the partner. Finally, even though we were interested in some traits (equity, spite, generosity) we added a number of other cards, including some Pareto inferior alternatives, to increase the cost of not looking (the ignored card could be really good or really bad). These cards also prevented inferences on possible payoffs, thereby increasing the uncertainty associated to not looking relative to the previous literature.

It took approximately 15 minutes to administer the tasks, including the oral instructions. Participants earned on average 50.4 tokens. They completed a short questionnaire about gender and the number of younger and older siblings. Subjects participated in
another task described and analyzed elsewhere. We implemented different conversions depending on the subjects’ ages. USC and LILA Burbank students (grades 6th to 10th) had tokens converted into money and paid immediately after the experiment in cash (USC students) or with an Amazon gift card (LILA Burbank students). For subjects at LILA Los Feliz (grades K to 5th) we set up a shop with 20 to 25 pre-screened, age and gender appropriate toys with different token prices.

3 Results

3.1 Choices

From now on, we refer to $TK$ as the choice of card $K \in \{A, B, C\}$ in task $T \in \{1, 2, 3, 4\}$, as described in Figure 1 (bottom). We represent by $(i, j)$ the card that has payoff $i$ for the subject and $j$ for the partner. Figure 2 presents the distribution of choices by task and age group. For all the statistical analysis, we perform the Pearson’s chi-square test of comparison of proportions and use a 5%-level as the benchmark threshold for significance.

The graph confirms known differences across ages over sharing rules. In task 1, the Pareto-dominated card $1B$ is least attractive to all groups. The majority of younger subjects prefer $1A$ but, as they age, participants start exhibiting a preference for the fair and socially optimal split $1C$. We notice that participants in the $C2$ age-category choose option $1A$ more often than older participants (p-values < 0.05) while both $C1$ and $C2$ choose option $1C$ significantly less often than older participants (p-values < 0.05). Not surprisingly, $2A$ is overwhelmingly preferred in task 2. In task 3, most young children exhibit spite ($3A$ over $3B$) but this trend is reversed as they age. Starting in middle school, the proportion of $3A$ choices decreases significantly while the proportion of $3B$ choices increases significantly (comparisons between $C1$ or $C2$ and $C3$ to $C5$ yield p-values < 0.001). The fair split $3C$ is not favored at any age due to its high relative price: it costs 2 tokens to transfer 1 token to the partner. Perhaps the most novel behavioral result is that obtained in task 4, where the subject always gets 4 tokens but must choose between 0, 4 and 8 for the partner. We observe significant heterogeneity in behavior. As

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6Subjects accumulated tokens for both parts of the experiment. While earnings in this task were admittedly low for the standards of economics experiments (around $2), the payment when we combined both parts was in line with the literature (around $12 for LILA Burbank and $14 for USC students enrolled in a 50 to 60-minute experiment). In compliance with LABEL policies, USC subjects also earned a $7 show-up fee.

7These included gel pens, friendship bracelets and erasers for young girls, figurines, die-cast cars and trading cards for young boys, and apps, calculators and earbuds for older kids. Children, however, could choose any toy they wanted in the shop and some toys, like the fidget spinner, was popular for all ages and gender. Overall, each child got between 3 and 7 toys depending on the tokens accumulated and the token price of the option selected.
children age, there is a steady change from the spiteful selfish (4A) to the fair (4B) and finally to the most generous (4C) option. The proportion of children who choose 4A is significantly higher in groups C1 and C2 compared to older groups (p-values < 0.05) and adults exhibit a significantly higher proportion of 4C choices compared to all younger participants (p-values < 0.01).

3.2 Lookups

A main objective of this research is to correlate choices with lookup patterns and, in particular, with the decision to not look at certain payoff boxes. Given the negligible cost of tapping and the significant uncertainty about payoffs, we posit that information should be revealed unless the participant has a strong reason not to. In this section, we determine whether individuals in our experiment engage in social strategic ignorance or, on the contrary, they consistently become fully informed of the alternatives before making their decision.

Figure 2: Distribution of choices by task and age group
Table 2 presents the lookup information. The left table reports the number of participants within each age group who looked at all payoffs in all tasks (Full), at some payoffs in some tasks and all payoffs in the others (Partial), and at no payoff in all tasks (Never). Since individuals behave differently in different tasks, it is also instructive to study lookup patterns at the task level. The right table presents for each task, the number of participants who looked at all payoffs in that task (All), at all the subject’s own payoffs but not all the partner’s payoffs (Self), at all the partner’s payoffs but not all the subject’s own payoffs (Other) and at neither all the subject’s nor all the partner’s payoffs (Neither), respectively.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Full</th>
<th>Partial</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>41</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>C2</td>
<td>49</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>C3</td>
<td>41</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>C4</td>
<td>51</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>C5</td>
<td>45</td>
<td>25</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Task</th>
<th>All</th>
<th>Self</th>
<th>Other</th>
<th>Neither</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1</td>
<td>254</td>
<td>13</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>Task 2</td>
<td>252</td>
<td>17</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Task 3</td>
<td>255</td>
<td>12</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>Task 4</td>
<td>268</td>
<td>3</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>1029</td>
<td>45</td>
<td>29</td>
<td>57</td>
</tr>
</tbody>
</table>

Table 2: Lookup patterns by age group (left) and by task (right)

Contrary to Dana et al. (2007) and Larson and Capra (2009), the majority of our participants chose to become fully informed before making their decision. As argued in Grossman (2014), variations in the experimental design are likely to affect information acquisition. In particular, we hypothesize that having a distribution of payoffs unknown to subjects is conducive to learning. At the same time, the fraction of fully informed subjects is significantly below 1 in all age categories (p-values < 0.001). There are also differences across age groups. The proportion of participants who become fully informed is significantly lower in C5 compared to C2, C3 and C4 (p-values < 0.03) and also significantly lower in C1 compared to C2 (p-value = 0.035). The results are confirmed with the analysis at the task level. While opening all 6 boxes is the most prevalent behavior in each task (87% to 92% of participants), there are some differences between subjects who concentrate on their own payoffs (Self) and those who concentrate on the payoffs of the partner (Other). Interestingly, among Self lookup trials, 56% correspond to subjects in C5 while only 11% correspond to subjects in C1. By contrast, among Other lookup trials only 17% correspond to subjects in C5 while 31% correspond to subjects in C1.

Within All lookup trials, two visual trajectories are most prevalent: Self-A; Other-A; Self-B; Other-B; Self-C; Other-C (48%) and Self-A; Self-B; Self-C; Other-A; Other-B; Other-C (36%). It suggests a simple and efficient information payoff gathering technology: from left to right either by role or by card. In only 3% of the observations, the
participant looks first at the three payoffs of the partner. Our youngest participants (C1) use significantly more the first search trajectory than subjects in C2, C4 or C5 (p-values < 0.001). Finally, within Self lookup trials, in 56% of the cases the subject looked at none of the other person’s payoffs. Similarly, within Other lookup trials, in 65% of the cases the subject looked at none of his own payoffs.

3.3 Choices conditional on lookups

Given that the vast majority of individuals become fully informed, it is not surprising that behavior conditional on All lookup follows very similar patterns as the unconditional behavior discussed in Figure 2. Due to the limited data, we cannot study separately the choices by task and age group conditional on Self, Other and Neither lookups. However, we can determine the overall tendency to favor the subject’s own payoff as a function of the information acquired. Table 3 describes these choices.

<table>
<thead>
<tr>
<th>Lookups</th>
<th>Percentage of choices consistent with max. own*</th>
<th>max. other**</th>
<th>min. own*</th>
<th>min. other**</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>83</td>
<td>18</td>
<td>16</td>
<td>43</td>
</tr>
<tr>
<td>Self</td>
<td>95</td>
<td>4</td>
<td>2</td>
<td>37</td>
</tr>
<tr>
<td>Other</td>
<td>22</td>
<td>66</td>
<td>68</td>
<td>20</td>
</tr>
<tr>
<td>Neither</td>
<td>62</td>
<td>25</td>
<td>26</td>
<td>50</td>
</tr>
</tbody>
</table>

* only in tasks 1, 2, 3; ** in tasks 1, 2, 3, 4

Table 3: Choices conditional on lookups

Lookups are highly revealing of the intentions of our participants. Perhaps not surprisingly, individuals tend to maximize the payoffs they focus on. Interestingly, however, this can take two very different forms. As in the previous literature, some subjects avoid looking at the payoffs of the partner (Self lookups) in a strategic attempt to maximize rewards without a negative moral feeling. These individuals choose the allocation that maximizes their own payoff significantly more often than subjects with All lookups (95% vs. 83%, p-value = 0.027). By contrast, some other subjects focus on the partner’s payoff as a commitment to behave altruistically. These individuals end up maximizing the partner’s payoff significantly more often than subjects who look at all payoffs (66% vs. 18%, p-value < 0.001). It is also noticeable that the subjects who engage in strategic ignorance for selfish and altruistic motives are in different age groups. As mentioned previously, the former are mostly adults (C5) whereas the latter are mostly young children (C1).

Table 3 also shows that participants who avoid looking at the payoff of the partner significantly reduce the chances of minimizing their own payoffs compared to those who
look at all payoffs (2% vs. 16%, p-value = 0.014). By the same token, subjects who avoid looking at their own payoff significantly decrease the chances of minimizing the payoff of their partner (20% vs. 43%, p-value = 0.012).8

Finally, we notice that participants who look first at all their payoffs tend to maximize their own payoff more often than those who open cards one by one (p-value = 0.037). This is not true for our youngest population C1, who typically maximize their own payoff no matter what. It suggests that underlying attention mechanisms play a role in decisions.

4 Discussion

We have reported several findings from a dictator experiment with children and adults in a situation where dictators can decide to remain strategically ignorant about the consequences of their choices on others. First, we have observed that strategic ignorance is unfrequent across all age groups. Second, strategic ignorance is associated with selfish behavior in adults while it is associated with generous choices in young children.

Our concern for others is closely related to morality and to our emotions around moral and immoral behavior. In principle, anticipating those emotions should guide our decisions. Evidence from adults indicates that emotions modulate behavior in prosocial tasks (Dana et al., 2006, 2007) and cheating games (Coricelli, Rusconi, and Villeval, 2014). Studies in children reveal that children respond to distress (Zahn-Waxler, Radke-Yarrow, Wagner, and Chapman, 1992) and to guilt (Kochanska, Gross, Lin, and Nichols, 2002) at around 2 years of age and gradually differentiate between guilt and shame (Ferguson, Stegge, and Damhuis, 1991). Evidence shows that guilt is aroused by moral norm violations in children between 7 and 12 years of age. They also feel ashamed as a result of moral transgressions. However, it is not known at what age children become able to anticipate such emotions and take them as input in their decision-making.

The fact that some children in our experiment avoid information and commit to a behavior atypical of their age suggests that those participants are able to anticipate their emotions. It is also interesting to observe a different pattern of information avoidance across ages, which reflects different levels of sophistication. Indeed, adults anticipate that information leads them to choose a non beneficial option. They act upon the anticipated regret of not remaining ignorant, so information avoidance is best described as willful ignorance. Children on the contrary anticipate that they will be tempted to choose the non generous option and they act upon anticipated guilt or shame of a bad behavior. In summary, adults avoid complying to moral norms while children avoid transgressing them.

8The sum of all percentages exceeds 100, since strategies that maximize own payoffs sometimes coincide with minimization of other’s payoff, and vice-versa.
Appendix A: Instructions

Hi, my name is Isabelle and these are my helpers [Introduce helpers]

[For USC: please put your cellphones away and do not talk with each other. Pull dividers]

Today, we are going to play a few games with you. Do you want to play games?

• [For Los Feliz: In all the games, you are going to win points. At the end, you can exchange the points for the toys you saw in the shop.]

• [for USC: at the end of the experiment you will be paid a $7 show up fee and 4 cents for each point you obtain]

• [for Burbank: at the end of the experiment you will be paid with an Amazon gift card 3.5 cents for each point you obtain]

In all the games, you will play with another person in this room. You will play with different persons in different games. Each time the computer will decide who you are playing with but you will not know who this is, and the point is not to find out.

This first game is called the “splitting game”. You will be playing with someone in this room but remember, you will not know who this person is. Each of you will see a screen like this. [Project SLIDE 1]

There are 3 cards and you need to pick one. Now, what’s in each card?

Each card has two numbers. The number at the top is the number of points you will have if you pick that card. The number at the bottom is the number of points your partner will have if you pick that card.

These numbers are hidden but you can see them by clicking on them. For instance, if I want to know the number of points I will get if I choose the second card, I click on it. [Project SLIDE 2]

And if I want to know the number of points my partner will have if I pick the third card, I click on it. When I click on a number, it stays on the screen. [Project SLIDE 3]

You can see as many or as few numbers as you want. You can pick a card without looking at any number, or you can look at some numbers, or you can look at all the numbers. It is entirely up to you. When you have a high number in one card, the number of points for your partner in that card can be high or low and vice versa. You decide which numbers you look at.

When you have decided which card you want to pick, click on the square at the bottom of the card. After clicking, you cannot make any changes, so you need to be sure of your choice before clicking.
You will be playing this game several times, each time with different cards and each time with a different partner. You will not know what your partner chose. At the end, the computer will tell you how many points you earned in the splitting game. These points are the points you gave to yourself and the points that all your partners gave you.

OK, let’s first play for pretend to see how the game works. Remember, this game does not count for real.

If you want to know how much you will earn if you select the first card on the left. What do you do?

[Ask participants to answer]

If you want to know what your partner will get if you select the card in the middle, what do you do?

[Ask participants to answer]

Let’s play for real now.

[Announce each new game]

Figure 3: Slide 1 (top), Slide 2 (bottom left) and Slide 3 (bottom right)
References


