Beware Of Popular Kids Bearing Gifts: A Framed Field Experiment

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This version: September 17, 2016

Abstract

The literature on pro-social behavior shows that older children are more generous than younger children; however, the level of individual generosity is heterogeneous even between children of the same age. This paper investigates whether a child's popularity affects his/her generosity. Our participants – 231 children, six to twelve years old – decide how many of their four colored wristbands they want to share with another anonymous child. We manipulate the visibility of this decision: in treatment Public, the decisions are revealed to the entire class at the end of the game, whereas in treatment Private children's decisions remain secret. In addition, we elicited each child's network of friends using an innovative "seating map" mechanism. Our results reveal that more popular children are more generous in Public than Private decision environments, while less popular children behave similarly in both cases. Moreover, older children in Public display greater generosity than (i) older children in Private and (ii) younger children in either Public or Private. Finally, in Public, older and more popular children share more than less popular older children, and more than younger children regardless of popularity; whereas, in Private there is no effect of popularity on children of any age. Our findings point to another reason to adopt transparent decision making in teams and organizations: it may promote the generosity of some (perhaps especially popular leaders) without detrimentally impacting the pro-sociality of others.

Keywords: popularity; status; children; field experiment; public decision making; pro-social behavior

JEL Codes: C93, J13

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I. Introduction

A substantial literature in psychology suggests a strong correlation between popularity and generosity: popular people are usually also perceived to be pro-social[1](e.g. Cillessen & Mayeux, 2004; LaFontana & Cillessen, 1999, 2002; Parkhurst & Hopmeyer, 1998; Prinstein & Cillessen, 2003; Rubin *et al.*, 2006; Wright *et al.*, 2012; Xie *et al.*, 2002). This finding resonates with observations with non-human primates, which also view higher-ranked individuals as generous with resources (de Waal & Suchak, 2010; Horner, Carter, Suchak, & de Waal, 2011). One explanation for this correlation could be that intrinsically generous people are more likely to become popular. Another possibility is that popular people, rather than having a greater preference for prosociality, are instead more likely to display generosity in public environments (perhaps due to signaling or reputation maintenance). To our knowledge, no previously discovered evidence has been able to distinguish these possibilities. Here we attempt to fill this gap by comparing the prosociality of popular (and less popular) people.

We report experiments that examine the connection between popularity and prosociality (sharing decisions) among children aged six to twelve in both public and private environments. A key finding of this paper is that more popular children are more generous than less popular in public but *not* private environments. Moreover, we find older children to be more generous than younger in both public and private contexts; while popularity and age have a significant and positive interaction only in public. Additionally, in the Strengths and Difficulties Questionnaire (Goodman, 1997), which measures behaviors, emotions and relationships, we find popular children to have systematically lower scores (indicating fewer negative behaviors), suggesting that popularity may be tied to fundamental personality attributes.

Our results cast substantial doubt on the possibility that innate generosity generates popularity. Rather, our findings are more in line with the view that popular children excel

[1]As anecdotal evidence, some self-help websites indicate that one of the key steps in becoming popular is to be nice, helpful, and friendly to others, e.g., http://www.wikihow.com/Be-Popular.

at public image maintenance. Further, our results help to explain the observation that *some* people behave more generously in public[2] (see, for example, Andreoni & Petrie, 2004; Hoffman, McCabe, & Smith, 1996; Lazear, Malmendier, & Weber, 2012). Likewise, they help to identify those people whose decisions are most influenced by public decision-making.

We conduct a framed field experiment (Harrison & List, 2004) with children aged 6 to 12 in Italy. We measure prosociality using a dictator game variant, and then later elicit the child's popularity (see Section II for the details regarding the way we do this). Further, we vary the visibility of decisions in the dictator game, allowing decisions to be made either in private (anonymous decisions) or public (decisions are known by all participants). As noted, doing this allows inference regarding whether popular people are innately more pro-social than others, as suggested by the literature above, or rather whether their prosociality is mediated by context.

The advantage to conducting this study in the school with children is twofold: First, we can exploit a natural social network rather than exogenously creating one in the laboratory. Second, we are able to capture arguably the most important network of friend in the child's life: the reason is that between 6 and 12, children spend most of their day at school (from about 8.30 to 16.30 in our sample). For most children, their only close friends are those at school. For this reason, most studies on childhood peer relationships are conducted in classrooms (for a review, see Gifford-Smith & Brownell, 2003).

Our research has many implications for public decision environments. For example, much charitable giving research focuses on designing incentives that can be applied to an entire donor base. An alternative is to conduct campaigns targeted specifically at those who are likely to respond positively to the initiative. Our findings suggest that it may be fruitful and potentially cost effective to conduct donation drives specifically targeted towards those

[2] See for example, Hoffman et al. (1996), where, in a double blind treatment, subjects were significantly more likely to give zero in a dictator game than in the treatment where experimenters were present; another example would be Andreoni & Petrie (2004), who showed that reduced confidentiality gives rise to greater generosity in fund-raising.

who are most popular. Another implication is that, since public officials are by definition popular (they are supported and elected by voters), and thus more likely to be sensitive to public decision environments, it may be valuable to ensure elected officials make their decisions in public. Further, our results help to explain why some people, but not all, become more generous when decisions are made in public.[3]

Finally, our data offer yet another reason to ensure transparency of individual effort within teams. In particular, doing so may promote the cooperativeness of some without detrimentally impacting the pro-sociality of others. Moreover, if those who behave more pro-socially also hold positions on influence within the team or organization, this may have the additional positive impact of nudging others in this same direction. Doing so may improve a group's so-called "social sensitivity" and consequently can improve its overall performance for the organization (Woolley et al, 2010).

The remainder of the paper is organized as follows: Section III details our hypotheses; Section IV describes the experimental design and procedures; Section V presents the results of our study; and Section VI discusses our findings and concludes.

II. Related Literature

Popularity typically refers to degree of likability and the level of support from the peers. For our purposes below, we will say that a person is more popular if more of her peers desire to be in her company. There are many factors closely associated with popularity, including physical appearance, personal charisma, specific skills or achievements that are more narrowly acknowledged, to more general societal appreciation (see, for example, Zwaan *et al.*, 2013). Additionally, popularity is closely related to status, which refers to a hierarchy that is socially recognized: status can confer popularity (*e.g.*, high achieving athletes gain popularity through excellence in sports performances; socialites obtain popularity through acclaimed family background). Popularity can also give rise to status

[3] For example, in Dictator games, it is routinely found that almost all people are selfish in "double-blind" implementations of the game, and only some people become more generous when the game is played in a "single-blind" context.

(*e.g.*, homecoming king/queen or elected president). Indeed, in some cases, scholars from sociology use status and popularity interchangeably (*i.e.,* popularity is defined as a form of social status) (*e.g.,* Cillessen & Lansu, 2011).

A large literature investigates the economic consequences of popularity or status. Key findings are that those with higher status seize a greater share of the surplus (Ball & Eckel, 2001) and enjoy wage premium later in life (Conti *et al.*, 2013); and status seeking behaviors generally result in a less productive use of resources and lower welfare (Abbink *et al.*, 2011; Bolle *et al.*, 2010; Charness *et al.*, 2013; Congleton, 1989; Fershtman & Weiss, 1993; Zizzo & Oswald, 2001; Zizzo, 2003). At the same time, psychologists have shown that popularity impacts people's childhood, adolescence and adulthood, in that being unpopular is usually associated with adverse behaviors, poor academic or work performance, and poor psychological health (for example, Kozlowski & Bell, 2003; Newcomb *et al.*, 1993; Schwartz, 2000; Scott & Judge, 2009).

As noted above, given the widely replicated result that popular people generally display prosociality, it is somewhat surprising that little evidence has been gathered on the innate prosociality of popular people. Prosociality is critical for humans to achieve and maintain cooperation in large groups of genetic strangers; likewise, it paves the way for large scale impersonal exchange, which forms the foundation of prosperous human societies. Indeed, human social interaction is largely shaped by pro-social preferences (Chen & Houser, 2012; Fehr *et al.*, 2008).

Brañas-Garza et al. (2010) report data informing the innate prosociality of popular individuals. The authors elicited the social network of first year undergraduate students who also made decisions in a standard dictator game. Those decisions were made anonymously and *privately*. Brañas-Garza et al. (2010) report that more socially integrated people display greater generosity in this environment, pointing to the possibility that innate altruistic tendencies covary with popularity. Alternatively, the authors' experiment design leaves open the possibility that the source of the increased generosity might be indirect reciprocity: more socially integrated individuals (i.e., those who are well-connected in the

network – he/she knows everybody and everybody knows him her) might be more generous because they believe they are more likely to benefit from the generosity of the other participants in the same session[4].

Our study differs from Brañas-Garza et al. (2010) in two important ways. First, the effect of indirect reciprocity is mitigated by design since children donate to anonymous children from an anonymous participating class of the same age. Consequently, more socially integrated individuals cannot expect to be asymetrically advantaged by others' generosity, Second, our meausre of popularity is similar to, but distinct from, the notion of social integration. The reason is that the latter measure relies on bi-directional network links between individuals, while popularity does not. Loosely speaking, to be "sociall integrated" a person must like and be liked by others, while to be popular a person must only be liked. Consequently, it need not be the case that popular individuals are also socially integrated.

It is worth noting that few economic studies have investigated the developmental roots of the relationships between popularity and pro-social behaviors. Studies of non-human primate prosociality often suggest dominance rank as a mediator of pro-social tendencies (*e.g.,* De Waal & Suchak, 2010; Horner *et al.*, 2011; Proctor *et al.*, 2013). The reason is that, in comparison to those with low rank, high-ranked primates tend to be more pro-social. Given the evolutionary connectedness between human and non-human primates, we may expect similar findings amongst humans, and, in particular, young children. Layous et al. (2012) suggests that pro-social behaviors boost peer acceptance in children aged 9 to 11 years. LaFontana & Cillessen (2002) concluded that 4th to 8th graders indicate liked others as pro-social and disliked others as antisocial. Similarly, they associated perceived popularity with both pro-social and antisocial behavior.

[4] In their experiment the recipients in the game are selected from the list of friends and in the experimental instructions this is made clear to participants. The authors write that, at the stage of network elicitation, participants were told that there was a chance that one of the listed friends would benefit later in the experiment (p. 251).

We contribute to the existing literature by shedding light on the extent to which popularity/status concern affects children's pro-social behaviors in both public and private decision contexts.

III. Hypotheses

In this section, we describe our main hypotheses.

H1: ***Public environments promote pro-social behavior among popular people to a greater extent than less popular people (Main Popularity Effect), while behavior in private decision contexts does not vary with popularity.***

According to social signaling, perception dictates people's prosociality, in that people care about their social image and whether they are perceived as fair and pro-social, while their behavior is driven by other people's knowledge about what they did (or did not do) (Andreoni & Bernheim, 2009; Charness, Rigotti, & Rustichini, 2003; Leimgruber et al., 2012; Schram & Charness, 2012). People exhibit less prosociality if they can be unfair without appearing so to others (Dana *et al.*, 2007; Kagel, 1996; Larson & Capra, 2009; Levitt & List, 2007; Schram & Charness, 2012; Shaw et al., 2014). Popularity is a product of peer perception, and it is a form of social image; thus, we hypothesize that popularity should have a positive effect on pro-social behavior only when decisions are public information, and have no influence at all if decisions are private. In addition, to build and maintain popularity (or social status), one need only appear nice, altruistic, and fair in public (as opposed to private) situations. Indeed, several studies report that people often engage in "impression management" (for example, Barclay & Willer, 2007; De Cremer & Sedikides, 2008; Milinski *et al.*, 2002).

H2: ***Older children display greater generosity than younger children in both public and private environments (Main Age Effect).***

It is well-established fact in the child development literature that as children get older, they become more generous (see, for example, Murnighan & Saxon, 1998; Zarbatany, Hartmann, & Gelfand, 1985). There are a several possible explanations. First, people

develop social preferences: they prefer sharing and fairness to selfish alternatives[5]. As children grow older, they develop an innate sense of caring about others and egalitarian preferences (Fehr et al., 2008). Second, older children also have a better understanding and ability to use theory-of-mind reasoning (Slaughter et. al, 2015), and are more likely to believe that their peers will perceive them negatively if they are shown to be selfish. This anticipated disapproval from peers further prevents them from behaving in a selfish manner (Houser et al. 2012). Therefore, we hypothesize that older children will behave more prosocially than younger children, regardless of social context.

H3: ***In public environments, older and more popular children display greater generosity than: (i) less popular older children; and (ii) younger children regardless of popularity; in private environments there is no effect of popularity on generosity among children of any age (Age & Popularity Interaction Effect).***

Older children with more developed theory-of-mind reasoning are more likely to pay greater attention to others' perception about them; therefore, those children may have added incentives to acquire or maintain popularity (Aloise-Young, 1993; Banerjee, 2002; Bennett & Yeeles, 1990). Since popularity is a public phenomenon, older children will behave more generously only in public, as opposed to private, settings. On the other hand, younger children with less developed theory-of-mind reasoning are less likely to pay special attention to social image, and therefore have less incentives to be more generous in public than private situations. For example, Shaw et al. (2014) suggest that as children reach age 8 or 9, they develop an understanding self-presentation; further, they begin to modify their behaviors to appear more favorably to others.

[5] 16- to 19-month-old infants gaze longer when resources are distributed unequally between two recipients, and prefer fair over unfair people (Geraci & Surian, 2011; Schmidt & Sommerville, 2011; Sloane *et al.*, 2012). In the preschool years, children allocate resources equally between recipients when possible (Damon, 1977; Hook & Cook, 1979; Olson & Spelke, 2008; Sigelman & Waitzman, 1991). Between the ages of 6 and 8, children will sacrifice their own resources in an attempt to be fair (Blake & McAuliffe, 2011; Shaw & Olson, 2012).

IV. Experimental Design and Procedure

Participants. The experimental sessions were conducted in March 2012. Our participants were 231 children (109 females[6]), six to 12 years old (M = 8.74 years, SD = 0.11 years). These children were enrolled in 12 classes across 5 schools in the district of Treviso (Italy). Each class was randomly assigned to one of two between-class treatments: Public (91 children; 40 females; Age M = 9.14 years, SD = 1.50 years); or Private (140 children; 69 females; Age M = 8.47 years, SD = 1.44 years)[7].

Procedures. Children participated in a Dictator Game[8]: each child received 4 colored rubber bands (i.e., Silly Bandz, www.sillybandz.com). The children then had to decide how many rubber bands to donate to another real, but anonymous, child from another participating, anonymous class of the same grade. Children made their decisions in private; one child at a time would step out of the classroom with his/her four bands and an empty envelope with his/her individually assigned ID written on it. Children were instructed that before returning to the room, they should put any bands they wanted to donate in the envelope, and hide any bands they decided to keep for themselves. Upon return to the classroom, they handed the envelope to the experimenter and were reminded not to reveal their decisions. At the end of the study, the envelopes with the bands were randomly and anonymously donated to other children from other participating classes (but only after those other children had completed their study; thus, each child was once a giver and once a receiver, but children were not aware that they would also be receivers).

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[6] Data was missing on the gender of 16 observations (twelve for treatment Private and four for treatment Public).

[7] In the Appendix we report the distribution of participants across the different grades and schools. In one school children in the first grade from two classes (N=52), participated in a unique experimental session for logistic reasons. These children were all assigned to the private treatment. Despite both classes participating in the experiment during the same session, we ensured the children from the two classes were separated from each other and we stressed that the names on the seating map had to include only children from their own class.

[8] Before the dictator game, in both the public and private treatments, to become familiar with the decision situation, children were asked to imagine having four rubber bands. They were then asked to indicate how many bands they would like to share with another anonymous real child participating to the experiment in another class or school. We asked each the child to think about this situation in private, without communicating with any other children, and to fill out a report sheet with the number of bands that they want to share. The script in Appendix A.1 reproduces the verbal instructions that were read to the children. Data from the training stage are analyzed in Blake *et al.* (2014).

We used rubber bands as reward, because they are popular amongst children of the ages we study. Different colors, sizes and shapes make this prize suitable to all ages and genders. Previous experiments with children living in the same geographical area have demonstrated the use of rubber bands as effective incentive for children in primary schools (see, for example, Blake et al., 2014; Houser et al., 2012; Maggian & Villeval, 2013). In addition, because children may be more likely to donate damaged rubber bands or those with shapes or colors they do not prefer, all children were told that at the end of the experiment they could trade bands with their classmates or with the experimenter (who effectively acted as a bands bank). However, such exchanges were uncommon. Finally, note that while differences in the desirability of rubber bands might affect the overall level of sharing, this would be common across treatments and thus cannot impact our conclusions regarding the effect of popularity or age on generosity.

Each classroom was randomly assigned to either the private or public treatment, and this assignment was held constant throughout the experiment[9]. In the public treatment, children were informed at the beginning of each game that at the end of each game all children's names and their individual decisions (*i.e.,* bands donated in the Dictator Game) would be written on the blackboard for every child to see. However, in the private treatment, children's decisions were not revealed and the experimenter carefully explained this to the children (see Appendix for more details). To keep these two treatments as similar as possible, we listed the children's names on the blackboard in both treatments; however, in the Private Treatment, we did not report the children's decisions, but only whether they participated in the activity.

At the end of the Dictator Game, without warning, we asked the children to fill out a sheet of paper depicting a table and 5 chairs (that we called the "Seating Map")[10]. Each child

[9] The entire experiment was conducted over 2 weeks. In this paper, we only consider data from the sessions conducted in week 1.

[10] The seating map used is reproduced in Figure A1.2 in the Appendix. When eliciting the network in the Public and Private treatments, one difference is the fact that children in treatment Public were informed about the choices of their classmates. If there is a treatment effect on network elicitation (say, for example, in Public, children's names are associated with how many rubber bands they donate, then the more generous and popular kids might get more votes as Friend 1 and/or Friend 2), we should expect differences in vote distributions. However, as can be seen from Figure A2.1 to Figure A2.5 in the Appendix, we find

was required to write his/her name on the chair on the head of the table and (up to) five other names of other children in the class that s/he would like to have seated close to him/her (from closer to farther). We informed the children that the names they reported would be kept confidential and that neither the parents nor the teachers or other friends would know which names they wrote. Children received an additional rubber band for their collaboration.

Using the names that the children reported, we created an index of popularity to use in our analysis. Note that, in each grade, the children had been in the same class for at least seven months, from September 2011 to March 2012 (*i.e.,* since the beginning of the school term, which in Italy starts the first week of September). We consider this to be a sufficient time period for them to have established networks.

Approximately one week before the experiment, we distributed to the children's parents (or legal guardians) a flyer with a description of our study (we call this activity) and asked them to sign a consent form in which they agreed that their child would participate in the study. In addition, we asked parents to answer an anonymous questionnaire using the same ID given to the child during the experiment. In this questionnaire, we asked information about: i) the family (*e.g.,* country of origin, marital status and education of the parents; number of children in the family and their age, etc.); ii) the child's extracurricular activities (*e.g.,* sports and hobbies, group versus individual activities, use of TV and PC, whether the child had a cellular phone, the amount of weakly allowance (if any), etc.). We also administered the strengths and difficulties questionnaire (SDQ), a questionnaire validated by Goodman (Goodman, 1997), which is used to elicit information about the child's emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems. While parents could refuse to answer all or part of this questionnaire, their child could participate only if his/her parents signed the consent form.

no evidence that the order in which the experiment was conducted impacted the distribution of votes for the most popular children (upper quartile of the popularity distribution) across treatments (K-S test, $p > 0.50$ for all cases).

V. Results

The Dictator Game

Overview of the sharing decisions On average, children shared more in Public, around 1.46 rubber bands out of 4, while they only shared about 1.19 rubber bands in Private. Table 1 below shows the percentage of children sharing 0 to 4 rubber bands in both the Public and Private treatments. In Public, the mode is to be fair and share 2, while in Private, the mode changes to be selfish and share 0.

Table 1. Sharing Decisions Across Treatments

	% of Children In Each Category	
Number of Rubber bands Shared	**Public**	**Private**
0	18/91 (19%)	49/140 (35%)
1	26/91 (29%)	37/140 (26%)
2	38/91 (42%)	41/140 (29%)
3	5/91 (5%)	4/140 (3%)
4	4/91 (4%)	9/140 (6%)
Average Bands Shared	1.46	1.19

Popularity Elicitation Protocol Using the data collected from the "Seating Map[11]", we constructed a popularity index for each kid i in his/her class[12]. We first counted the number of children in one class who indicated a particular child in their "Seating Map". Then we created a popularity count following the rule of Borda Counts. Each child named on the "Seating Map" received a vote that translated into points. The votes were counted by giving each candidate a number of points equal to the number of candidates (denoted by n) ranked

[11] Our measure of popularity captures the so called "sociometric popularity", which refers to how much a child is liked or disliked by peers and it is usually assessed via peer nomination. As noted by Slaughter et al., 2015, recently, a theoretical and empirical distinction has emerged between sociometric popularity and perceived popularity where, this last concept refers to the extent to which peers or other observers consider a child to have high status within the peer group and it is usually assessed via peer or teacher reports about which children are "popular" or, on the other side of the coin, which children are "rejected." This distinction is important in light of the different behavior profiles of sociometrically popular and perceived popular children, with the former tending to have strong interpersonal and communication skills, to be prosocial and cooperative, and to be low on aggression while perceived popular children also tend to be communicative and prosocial, but at the same time, they often engage in relational aggression which they may use strategically to manipulate others in order to gain or maintain their position in the social group. See Slaughter et al., (2015) for a more detailed discussion on this.

[12] In the instructions, the children were told to write down (up to) five names of other children in the SAME class; therefore, the popularity measured here is based on class level. See the Script used reproduced in the Appendix A.1.

lower than them, such that a candidate receives $n - 1$ points for a first preference; $n - 2$ for a second; …; and $n - 5$ for a fifth preference (since we only elicit at the maximum five names/preferences). Note that the number of candidates n is the total number of kids in a class, including those who did not participate in the experiment but still appear in the "Seating Map" names.

Each child in a class was then ranked according to popularity count in increasing order. We then created the popularity index to reflect ranking outcomes. Popularity is ranked in ascending order; thus, the lower the popularity index, the more popular the child in his/her class.

Table 2. Summary Statistics for popularity index

Treatment	**Sharing Decision**		**Popularity Index**			**Obs**
	Mean	S.D.	Mean	S.D.	Max Class Size	
PUBLIC	1.46	1.01	9.69	5.66	23	91
PRIVATE	1.19	1.14	9.19	5.21	20	140
Total						231

Table 2 above presents the summary statistics of popularity index across treatment. The distribution of popularity index among Public and Private treatments is nearly identical ($p=0.20$)[13]. The "Max" statistic shows the maximum number of children who participated in the experiment among all classes included in each treatment.

Popularity effect on Sharing in Public vs. Private treatment

We begin by aggregating the sharing decisions data. Specifically, we define a new dummy variable $Sharing$, which equals 1 if the number of rubber bands shared is greater than or equal to 2 and equals 0 otherwise. Therefore, the higher the value of $Sharing$, the higher the probability to share and the greater the level of generosity.

We used a binary specification with 2 as the cutoff for two reasons. First, doing so leads to a roughly equal split in our sample in both the public and private treatments. For example,

[13] All p-values reported in this paper are based on two-sided tests.

in Public 51% of our participants shared two or more silly-bands, while 49% shared fewer than two. Second, cell sizes are highly unequal in our data. For example, in both treatments only 9% of our observations are in the top two cells (see Table 1). Consequently, aggregation is unavoidable when performing our analysis, and the procedure we adopted seems reasonable. Alternative specifications, such as using the total amount of rubber bands shared as the outcome variable, yield qualitatively identical results.

Figure 1 and 2 below provide initial evidence for our first hypothesis: *Popularity promotes pro-social behavior to a greater extent when decisions are public than when they are private*. If this hypothesis is true, we should expect more popular children to behave more generously in Public than in Private while less popular children should share in the same way across Public and Private environments.

Figure 1 details sharing by kids with popularity indices below median (the lower the popularity index, the more popular is the child). In particular, it shows the rate of sharing in Public and Private by popularity. The x-axis reports decreasing levels of popularity (with the highest level of popularity on the left), while the y-axis reports the proportion of children sharing two or more silly-bands.

One observes that the most popular children (Popularity index=1) share more in Public ($sharing_{public} = .60$) than in Private ($sharing_{private} = .22$), although the difference is not statistically significant (p=.18)[14] due to the low number of observations ($N_{private} = 9$, $N_{public} = 5$). Across groups, one observes that the children whose popularity index lies within top 25th percentile of the popularity distribution share about 56% of the time in the Public treatment, and only 28% of the time in the Private treatment (p=.03). Next, we find that children whose popularity index is within top 33rd percentile of the distribution share about 54% of the time in Public and 29% of the time in Private (p=.04). Last, children whose popularity is above median share 38% of the time in Public and 51% in Private (p=.20).

[14] All reported p values were from Mann-Whitney two-sided tests under the null hypotheses $sharing_{private} = shaing_{public}$.

In sum, as popularity falls (from the most popular, to the top 25%, top 33% and finally top 50% of the popularity distribution) we observe that children behave more similarly between the Public and Private environments.

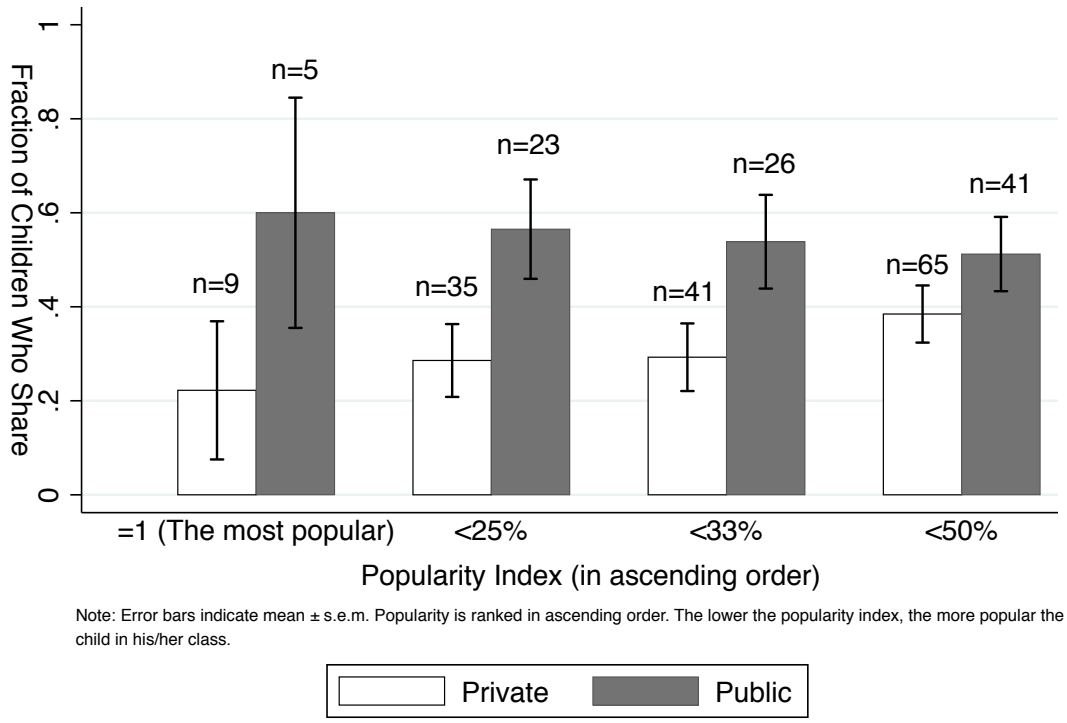


Figure 1. Sharing in Public vs. Private by popularity – Most Popular kids (i.e. children whose popularity index lies below the median of the popularity distribution)

In contrast, Figure 2 shows the sharing in Private and Public by kids whose popularity is above the median. The x-axis reports the level of popularity in increasing order from left to right. The y-axis reports the fraction of children sharing two or more silly-bands.

Inspection of Figure 2 reveals that, irrespective of the subset considered, children who are less popular than the median display about the same level of sharing in Public and Private (in all cases $p > 0.1897$).

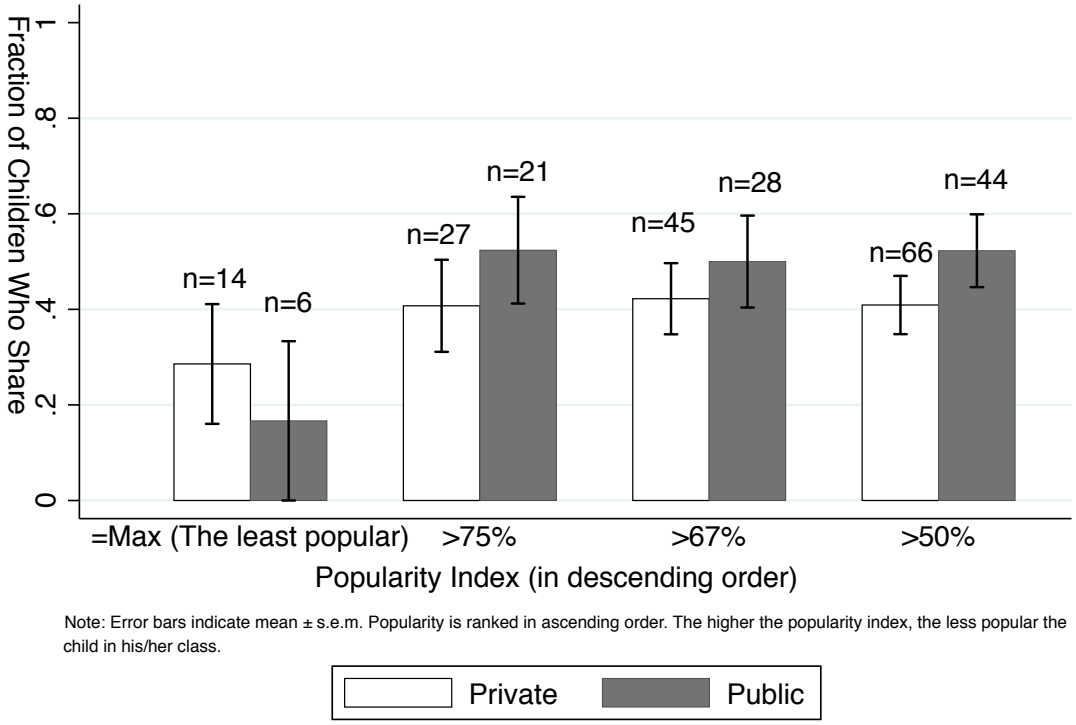


Figure 2. Sharing in Public vs. Private by popularity – Least popular kids (i.e. children whose popularity index lies above the median of the popularity distribution)

Figure 3 lends support to our second hypothesis: *older children display greater generosity than younger children in both Public and Private.* Here, we define "young" children from grade 1 to 2 and "old" those from grade 3 to 5 (following, e.g., Shaw et al., 2014, Houser et al., 2012)[15]. Older children share about 66% of the time on average, while younger children share only 23% of the time. Further, the fraction of children sharing is significantly greater for older children (in Public or Private) than younger ones in both Public and Private ($p < .01$ for all four pair-wise comparisons).

[15] Alternative specifications (e.g., median split, median = 8 years old) yield similar results. Note that in the regression analysis we use actual age in years as independent variable.

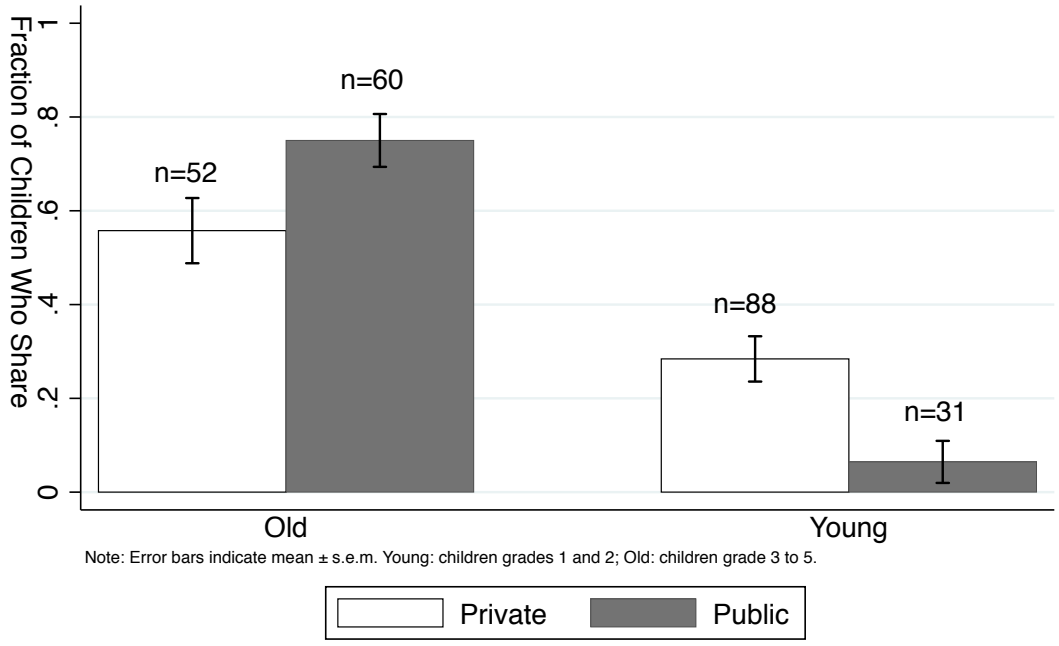


Figure 3. Old vs. Young Children Sharing

Figure 4 below offers initial evidence in support of our third hypothesis: *1) In the Public treatment older and more popular children share more than: (i) less popular older children; and (ii) younger children regardless of popularity; 2) In the Private treatment: there is no effect of popularity for children of any age.* To see i), note that older and more popular children share 87% of the time in Public, while their less popular but same-aged counterparts share (an insignificantly different) 71% of the time, where most popular children are those whose popularity index lies in the top 25% of the distribution. The younger and more popular children do not share at all, and the younger and less popular share only about 14% of the time (where less popular indicates children whose popularity index lies within the bottom 25% of the distribution), both of which are significantly lower than the likelihood of sharing by the older and more popular children ($p<.01$). Next, with respect to 2), note that, in Private, young children with different popularity behave statistically similarly, as do older children with different popularity ($p=.27$ and $p=.56$,

respectively). Similar patterns hold for other popularity groups such as those with popularity indices below the 33rd percentile.

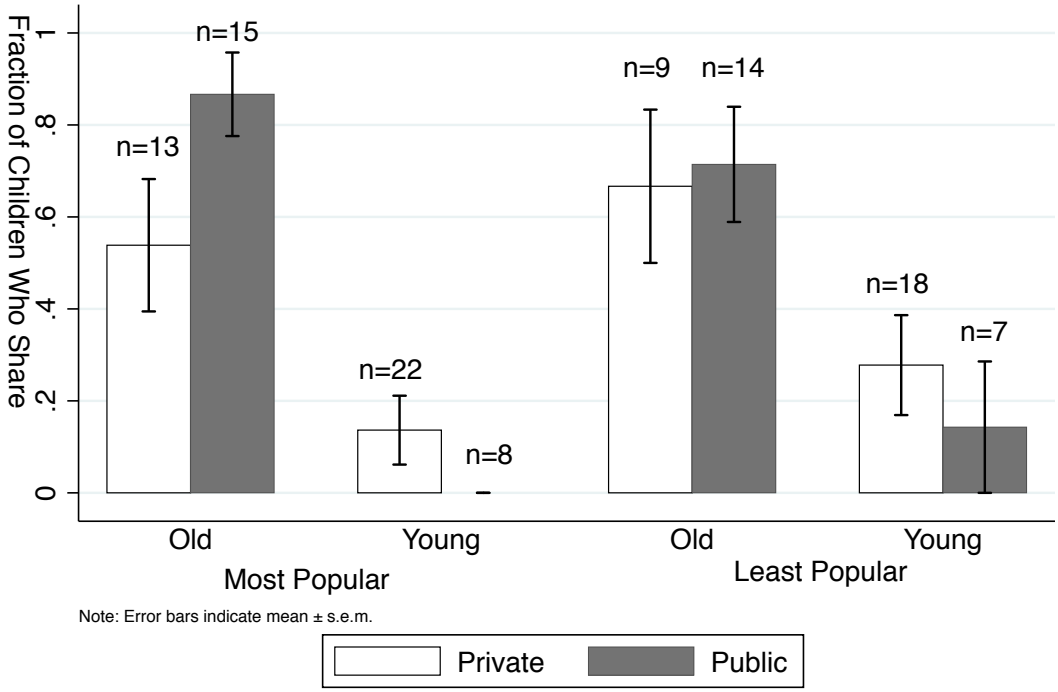


Figure 4: Age and Popularity Effect On Average Sharing

Next, we provide further support for our hypotheses by reporting Probit estimates of the following model:

$$Sharing_i = \beta_0 + \beta_1 * Public \quad (1)$$

$$+\beta_2 * Popularity_i + \beta_3 * age_i + \beta_4 * male + \beta_5 * Prosocial_i \quad (2)$$

$$+\beta_6 * Public * Popularity_i + \beta_7 * Public * age_i + \beta_8 * Public * male \quad (3)$$

$$+\beta_{10} * Popularity_i * age_i + \beta_{11} * Popularity_i * Public * age_i + \varepsilon_i \quad (4)$$

Where, in all models, the dependent variable is the dummy $Sharing_i = 1$ if number of rubber bands shared ≥ 2; 0 otherwise. The independent variables include the dummy variable $Public$ identifying the treatment (=1, if it is Public Treatment, and 0 otherwise); the variable accounting for $Popularity_i (= -$ Popularity index for child i, for which the higher the value, the more popular child i is); the Age_i (= Age of child i in years); the gender captured by the dummy variable $Male_i$ (= 1 if child i is male, 0 otherwise). We also

include the variable $Prosocial_i$ indicating the Prosociality score obtained in the SDQ[16] filled by the parents. This variable provides some measurement of the child's innate prosociality which potentially can also account for the sharing likelihood.

Results of the estimations are reported in Table 2. Model (1) only includes the treatment dummy, which is not significantly different than the Private treatment (p=.41), suggesting that on aggregate kids behave similarly in both Public and Private environments.

In Model (2), we also include as independent variables popularity, age and gender. As previously evidenced in Figure 4, we find that age has a significant and positive effect on sharing probabilities: a child one year older is 17% more likely to share (everything else equal). This result brings further evidence consistent with hypotheses H2. We can see that popularity, on its own, does not have an effect on overall sharing decisions. Being a male has a negative impact on sharing, as males on average are less likely to be generous than females, although the effect is not statistically significant. Lastly, those with higher pro-social tendencies display a higher willingness to share, even if the coefficient does not achieve significance.

In Model (3) we include some interactions of the treatment dummy Public with i) Popularity, ii) Age and ii) Gender. We notice that popularity has a significant and positive effect on the sharing probability in Public (p=.05) while not in Private (p=.49), which suggests that more popular kids are more likely to share in Public. Nonetheless, they are no more generous than in Private. Less popular kids behave more similarly between Public and Private. Indeed, children ranked first (in terms of popularity) are 20% more likely to share than children ranked eleventh in Public treatment, while in Private treatment children ranked first (in terms of popularity) are equally likely to share than children ranked eleventh. This result provides further support for our hypotheses H1. Additionally, we find that age has a significant and positive impact on both Public and Private treatments (p<.01 in both cases). Finally, pro-social tendencies play a significant and positive role in sharing

[16] The SDQ questionnaire translated in different languages, as well as the scoring rules for each subscale, can be found at this website: http://www.sdqinfo.com.

decisions with a one-point increase in pro-social measurement bringing about 4% increases in sharing probabilities.

In Model (4), we replicate the same estimation of Model (3) but we add the triple interaction term: Public x Popularity x Age to discuss the interaction effects of popularity and age on sharing probabilities. We find that age and popularity together have a significant and positive impact on sharing in Public ($p<.01$), but do not have an effect in the Private treatment ($p=.61$). This suggests that the more popular and older kids (recall that the more popular the child is, the lower the popularity index) are more likely to share in Public, however, they are no more likely to do so in Private. This result further supports our hypotheses H3.

Table 2. Probit Regression Results

	Sharing (=1 if number of rubber bands shared ≥2)			
Variables	Marginal Effects			
Model	(1)	(2)	(3)	(4)
Public	.13	.05	-.90***	-.99***
	(.16)	(.11)	(.13)	(.00)
Popularity		-.0005	-.006	-.04
		(.007)	(.01)	(.07)
Public×Popularity			.02*	-.14
			(.01)	(.10)
Age		.17***	.12***	.15*
		(.04)	(.03)	(.09)
Public×Age			.19***	.39***
			(.07)	(.14)
Popularity×Age				.004
				(.008)
Public×Popularity× Age				.02*
				(.01)
Male		-.08	-.13	-.13
		(.08)	(.09)	(.10)
Public×Male			.11	.16
			(.16)	(.17)
Prosocial		.04	.04*	.04*
		(.02)	(.03)	(.03)
N	231	182	182	182
Pseudo R2	0.01	0.19	0.23	0.24

Note: This table reports marginal effects of the respective independent variables on the probability of sharing two or more silly-bands. The marginal effects represent the change in the probability of being a sharing two or more silly-bands for a one unit change in the independent variables. All marginal effects are evaluated at the sample mean.
Standard errors are in the parenthesis. Errors are clustered at group level. ***,**,* indicate significance level at p=.01,.05, .10, respectively. N decreases in regression 2, 3 and 4 due to some missing data on variable age, male and prosocial.

Further Analysis of the Questionnaire Results

In order to gain a better understanding of the characteristics of most (upper quartile) and least (lower quartile) popular children, we use the information collected from the parents in the questionnaire to detect the existence of systematic difference between children who belong to the upper or lower quartile of the popularity distribution. Interestingly, the two groups are not different when looking at the observable characteristics of the households (i.e. education level and job of the parents, marital status, number of siblings, time spent watching television or in front of the computer). With one only exception: the most popular children are more likely to attend group activities than the least popular ones (76% versus 41%, Two-sample Wilcoxon rank-sum (Mann-Whitney) test, z=3.461, p=0.006 two-sided).

The two groups of children seem to differ systematically when we look at the behaviors as reported by the parents. The parents of the most popular boys report worse school performance of their children compared to what reported by the parents of the least popular ones[17] (Two-sample Wilcoxon rank-sum (Mann-Whitney) test, z=2.018, p=0.044 two-sided), a more detailed discussion can be found in the Appendix A.4.

Finally, when looking at the Strengths and Difficulties Questionnaire (Goodman, 1997), we find that the most popular children have a lower score (implying fewer behavioral or emotional problems) in all subscales except for the pro-social one, suggesting that popularity is related to a psychological characteristics.[18]

[17] The parents are asked to rate the school performance of their child compared to the other in the class according to the following scale: 1=well above the average; 2= above the average; 3= average; 4=below the average; 5=well below the average.

[18] When considering the total score, as well as the scores of the sub-scales of the SDQ we only find a significant association between the sharing behavior of children and the subscale capturing reported emotional problems. We find that parents of children who share two or more sillibands report their children to have significantly more emotional difficulties compared to the reported by parents of children sharing fewer than 2 rubber bands. Other subscales, as well as the total scale, do not display any significant association with the average amount of rubber bands donated, the probability of sharing 2 or more rubber bands, as well as the probability of not sharing anything.

Table 3. Score of the Most and Least Popular children in the Strengths and Difficulties Questionnaire answered by parents, standard deviation in parenthesis.

	Most popular kids (upper quartile)	**Least popular kids** (lower quartile)	**Two-sample Wilcoxon- Mann-Whitney test**
Emotional Symptoms Scale	1.60 (1.67)	2.52 (2.10)	z=2.169 p=0.030
Conduct Problem Scale	1.26 (1.13)	1.85 (1.21)	z=0.244 p=0.015
Hyperactivity Scale	2.56 (1.80)	3.80 (2.21)	z= 2.813 p=0.005
Peer Problem Scale	0.98 (1.19)	2.02 (1.99)	z= 2.975 p=0.003
Pro-social Scale	7.88 (1.85)	7.91 (1.86)	z=0.024 p=0.981
SDQ total (0-40)[19]	6.23 (3.86)	9.88 (5.16)	z= 3.525 p=0.000

Note: As evidenced by (Goodman, 1997) the score from the prosocial scale is not incorporated in the total difficulties score since the absence of prosocial behaviors is conceptually different from the presence of psychological difficulties. Note that, for all subscales, lower score indicates lower problems.

VI. Conclusion and Discussion

This paper explores relationships among popularity and pro-social behaviors in children. Our results show that more popular children display greater prosociality in public than in private settings, while the behavior of less popular children does not vary across these contexts. Further, age has a positive effect on pro-social behaviors, with older children sharing more. We also find positive interaction effects of popularity and age on prosociality, but only in public environments: older and more popular children are most responsive to a change in decision-making context.

Our findings have several important implications. First, although popular people are often regarded as more pro-social, our results demonstrate that popular people are not intrinsically more pro-social. Instead, they act more generously in public, while they are less likely to do so in private. Therefore, inferences based on popular people's public behaviors may result in misplaced trust. Second, our findings offer approaches to promote charitable giving. Since popular people are more likely to act prosocially in public environments, it may be efficient to tailor donation campaigns so that they influence the

[19] All subscales except the scale for prosociality.

decisions of the popular. Finally, our results offer further reasons for transparency in public decision-making, as the relevant decision-makers in these contexts are typically popular.

Our results also have direct implications for the design of team production environments within organizations. A recent article by Woolley et al. (2010) reports data showing that team performance is higher when the team's "social-sensitivity" is higher, and in particular when the number of female members of the team is larger. Our data suggest that another way to promote social-sensitivity is to ensure transparency of individual effort within the team environment. Making effort public promotes the pro-sociality of some without reducing that of others. Moreover, if those who behave more pro-socially are also in positions of influence within the organization, then this may nudge others in that same direction. The overall benefit in this case to social-sensitivity could be substantial, and lead to corresponding increases in overall team performance within the organization.

An important limitation of our study is that it focuses on the behaviors of children. The advantage to doing so is that their social network is, in relation to adults, much more clearly defined (their classmates). Nevertheless, we drew inferences from our data to adult behaviors, though it would of course be valuable to conduct the studies with adult populations necessary to confirm these inferences.

We find that popular children are more generous in public than private, but that this is not the case for less popular children. We did not set out to establish a causal link between popularity and prosociality, and doing so requires analyses far beyond the intended scope of this paper[20]. Nonetheless, our results cast doubt on the possibility that innate generosity causes people to become popular. Rather, our results suggest that more popular people are more likely to excel at image maintenance.

We found it interesting that popular children generally had lower scores (implying fewer behavioral and problems) in the Strengths and Difficulties Questionnaire, (Goodman,

[20] Ideally, one would randomly assign popularity within friendship networks. This might be possible in controlled environments with artificially constructed social networks.

1997), suggesting that popularity is tied to fundamental personality characteristics. It may be the case that people better at presenting themselves publicly, or perhaps those more sensitive to social pressure, are more likely to become popular. It would be especially profitable for future research to investigate this possibility.

Appendix

A.1. Experimental Procedures and Instruction.

Our experimental sessions have been conducted in Italian public primary schools. Children attend the primary school from 6 to 11 and they are normally divided in 5 grades, grouped in class of approximately 15-25 children. The teacher was present for the whole duration of the experimental session but we asked him/her not to intervene.

In each class, the experimental instructions were explained verbally to the children following the script reproduced below. Since the task is trivial but can be difficult to understand for some young children we repeated more than once the instructions and we allowed each child to ask questions about the rules of the game (but not the purpose).

a. Dictator Game

Before the dictator game, both in public and private treatment, in order to get familiar with the decision situation, children were asked to imagine having four rubber bands and to indicate how many bands they would you like to share with another anonymous real child participating to the experiment in another class or school. We ask each the child to think about this situation in private and not to communicate with other children and then fill a report sheet with the number of bands that they want to share. Once this training stage was completed, children made a real decision. Children in public treatment were informed that at the end of the activity their name and choice would have been written at the blackboard. For children in the private treatment only the name but not their choice was written. In each class the experiment has been conducted following the script below.

Script: Dictator Game.

Once in the class, the experimenter collects the consent form signed by the parents and writes on the blackboard the names of the children who participate. After the training stage was completed, the Dictator Game was introduced following the script below.

Script: Dictator Game

Ok, now you have another decision to make. This time all your decisions now will have real consequences. Let me explain better. This time we will give you 4 rubber bands. Now , each of you can decide if he wants to share his rubber bands 4 with another boy or girl from another class who will participate in the game later. Now, each of you will leave the class, you will receive 4 rubber bands and in secret have to decide if he wants to share his bracelets with this person and if he decides to divide must put the rubber bands who decides to give the envelope. Each of you in fact have a bag like this.[*The assistant shows the envelope to children*]. So if you want give any rubber bands to another child, just put it in the envelope. Put the rubber bands that you want to keep for you in your pocket and do not let them see by your classmates until the end of the activity. Once you have taken your

decision, when entering the class, you have to leave the envelop to the assistant. So, while you wait for your number to be called we ask you to think carefully about what you want to do in the situation described, in order to be fast in the decision.
[*Repeat to each child what to do and to hide the bracelets that they want to keep outside the envelope. When the children come back in to the class afer the decision is take, they leave the envelope to the assistant. The envelopes will then be distributed to the children of a following experimental session (at the end of the planned activity)]*.

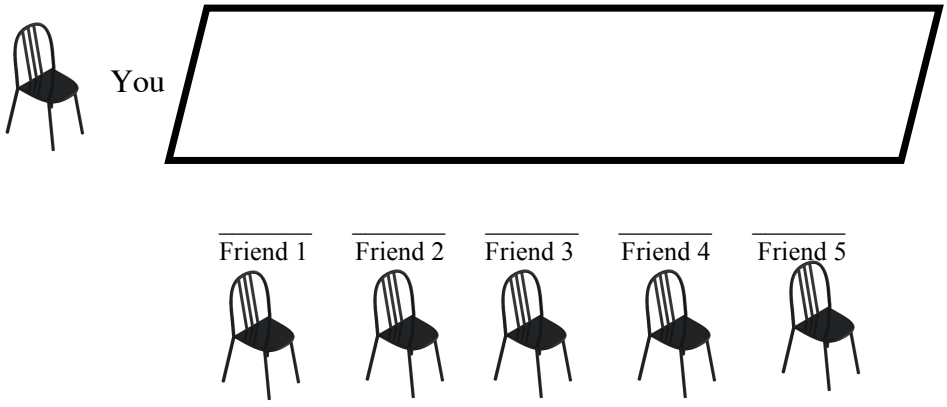
TREATMENT: Public vs. Private
[*Public: say the following sentence*:] After you have made your choice, we will open the envelopes in front of everyone and write on the board what has chosen each one of you so that everyone can see what you have decided.
[Private: *say the following sentence*:] Your choice will remain anonymous.

b. Seating Map: Eliciting the network of friends and their popularity

After the dictator game, we ask children to fill a sheet of paper (see Figure A1.1) where a table and 5 chairs are depicted. Each child has to write his/her name on the chair on the head of the table and (up to) five other names of other children in the class that s/he would like to have seated close to him/her (from the closer to the farther). We inform children that the names they report will be kept confidential and neither the parents nor the teachers or other friends will know what they write. Children receive a rubber band for their collaboration. We can use the names reported to map child's network of friends and create an *index* of popularity that we will use in our analysis.

Figure A1.1. Seating Map: Report Sheet for elicitation of network of friends and their popularity

If you were sitting at the head of a table with 5 friends, who would you place where? Please indicate the name and surname of your friends.



A.2. Additional Tables

Table A.2.1 Participants, Treatment and Grades.

	Private	Public	Total
Grade 1	52	16	68
Grade 2	36	15	51
Grade 3	15	17	32
Grade 4	18	20	38
Grade 5	19	23	42
Total	140	91	231

Table A.2.2 Participants, Treatment and Schools.

	Private	Public	Total
School 1 (Altivole)	37	17	54
School 2 (Campagna)	0	31	31
School 3 (Caselle)	0	20	20
School 4 (Merlengo)	52	23	75
School 4 (Ponzano)	51	0	51
Total	140	91	231

Table A.2.1 Non-Parametric Tests - Effect of Popularity and Age on Average Donation

	Public	**Private**	**Public vs Private**[21] p-value
THE Most Popular Children (Popularity Index =1)	1.6 (.75) N=5	0.78 (.28) N=9	0.36
Old Children	1.88 (.11) N=60	1.62 (.13) N=52	0.06*
Young Children	0.65 (.15) N=31	.94 (.12) N=88	0.35
Most Popular Children (Upper Quartile)	1.48 (.23) N=23	1.03 (.18) N=35	0.08*
OLD (in grade 3-5)	2.13 (.19) N=15	1.62 (.27) N=13	0.06*
YOUNG (in grade 1-2)	.25 (.16) N=8	.68 (.21) N=22	0.26
Least Popular Children (Lower Quartile)	1.54 (.22) N=26	1.22 (.17) N=41	0.26

[21] We here performed the Mann Whitney test..

OLD (in grade 3-5)	1.82 (.25) N=17	1.6 (.19) N=15	0.47
YOUNG (in grade 1-2)	1 (.24) N=9	1 (.41) N=26	0.97

Standard Error reported in the parenthesis, * indicates 10% significance level, two-sided test.

A.3. Additional Statistical Tests

As described in the main text, when eliciting the network in Public and Private treatment a difference is given by the fact that children in treatment Public are informed about the choice of their classmates. In order to exclude major effects related to this procedure, in the Figure A2.1 below we report the Kernel Density Estimate of the Popularity Index across treatments: if the public treatment would have had an effect on the elicitation of the network of the friend we should observe a difference in the way the popularity index is distributed. However, both from the Figure and by the K-S test we can exclude this hypothesis, (K-S test, $p>0.99$) across treatments.

Figure A.3.1: Kernel Density Estimate of the Friends 1 Nomination For Most Popular Children By Treatment

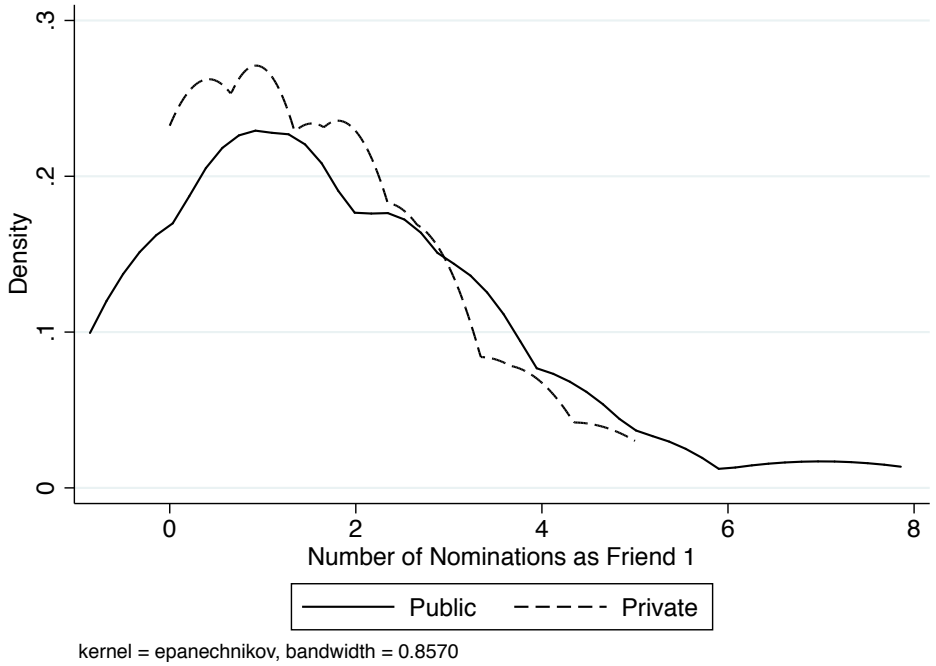


Figure A.2.2: Kernel Density Estimate of the Friends 2 Nomination For Most Popular Children By Treatment

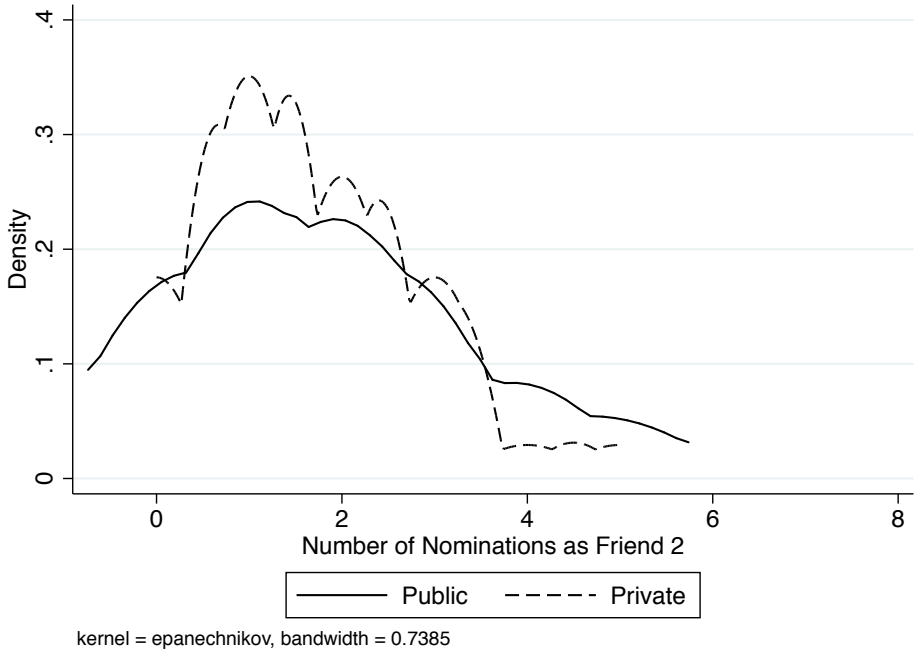


Figure A.2.3: Kernel Density Estimate of the Friends 3 Nomination For Most Popular Children By Treatment

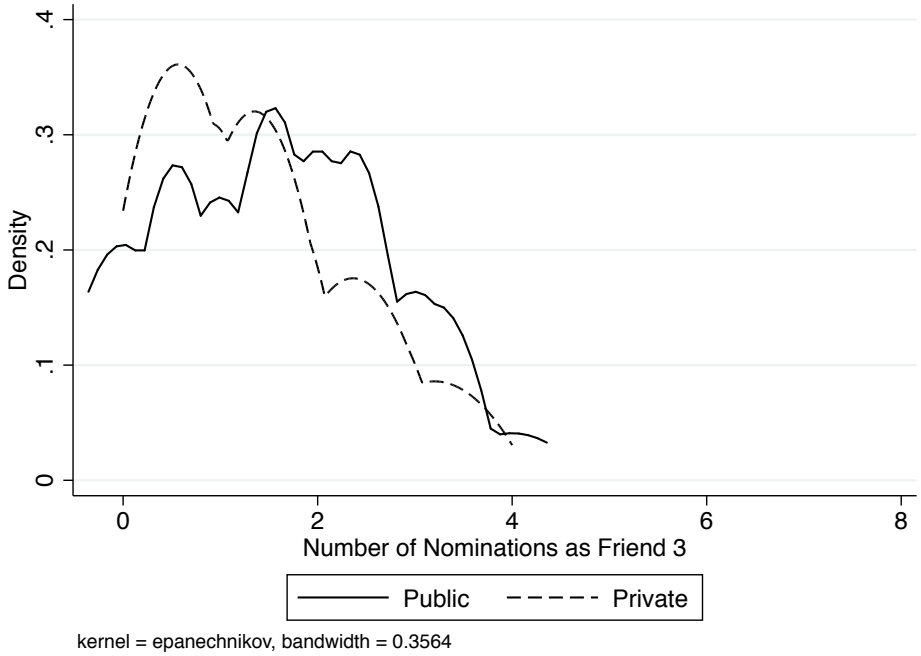


Figure A.2.4: Kernel Density Estimate of the Friends 4 Nomination For Most Popular Children By Treatment

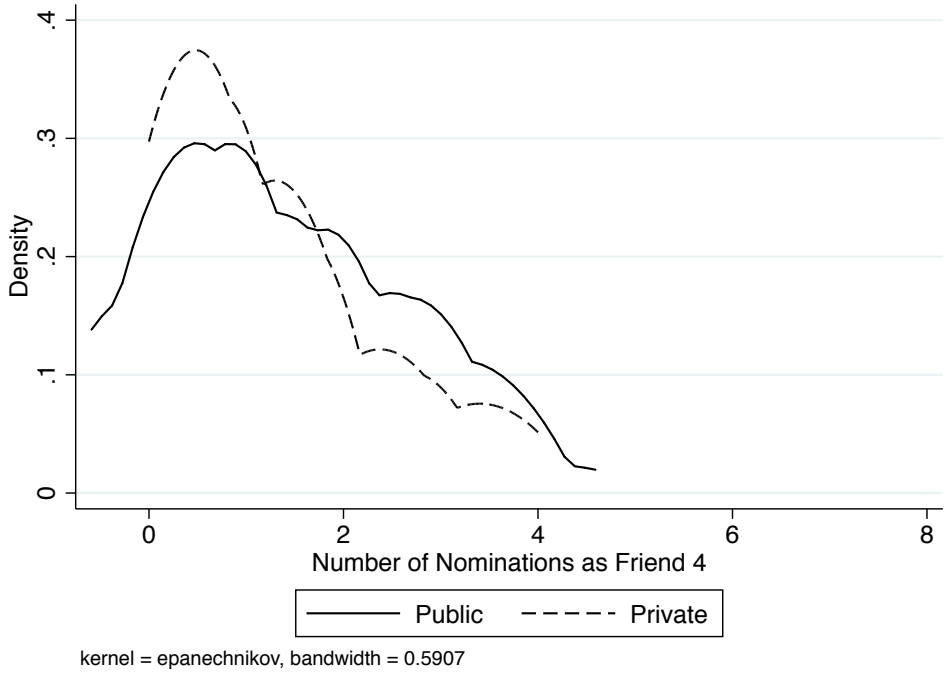
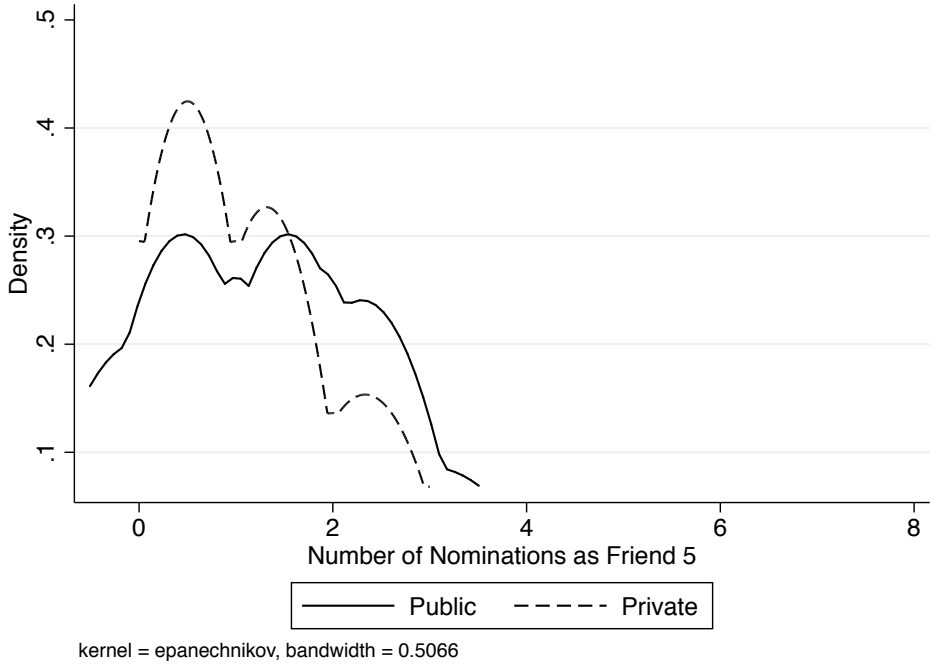


Figure A.2.5: Kernel Density Estimate of the Friends 5 Nomination For Most Popular Children By Treatment



A.4. Additional Statistical Tests

In Table A.4.1 we report results from a set of non-parametric tests aimed at investigating systematic differences between most and least popular children using the information collected from the questionnaire answered by the parents.

It can be noted how most and least popular children do not seem to differ with respect any of the observable characteristics of the household.

Table A.4.1. Differences between most and least popular children, standard deviation in parenthesis.

	Most popular kids (upper quartile)	**Least popular kids** (lower quartile)	**Two-sample Wilcoxon rank-sum (Mann-Whitney) test**
Country of birth 1=if born in Italy, 0 otherwise.	0.96 (.20)	0.92 (.28)	z=0.787 p=0.432
Single child 1= if single child, 0 otherwise	0.04 (.21)	0.02 (.14)	z=0.641 p=0.523
Respondent of the questionnaire 1=mother, 2=father, 3=other	1.17 (.53)	1.26 (.38)	z=0.746 p=0.456 Fisher's exact=0.640
Martial status of the respondent 1=single, 2=married (or equivalent), 3=divorced, 4=widowed	2.02 (.15)	1.98 (.32)	z= 0.812 p=0.417 Fisher's exact=0.327
Education of the respondent 1=V grade; 2=VIII grade; 3= high school; 4= Degree	2.79 (.68)	2.73 (.81)	z=0.570 p=0.567 Fisher's exact=0.154
Job of the respondent 1=yes, full time; 2=yes, part time; 3=no	1.81 (.82)	1.86 (.87)	z=0.209 p=0.834 Fisher's exact=0.707
Education of the partner 1=V grade; 2=VIII grade; 3= high school; 4= Degree	2.75 (.64)	2.82 (.81)	z=0.426 p=0.670 Fisher's exact=0.235
Job of the partner 1=yes, full time; 2=yes, part time; 3=no	1.19 (.49)	1.24 (.60)	z=0.171 p=0.864 Fisher's exact=0.628
Who takes care of the child after school 1=parents; 2=grandparents, 3=other relatives, 4=baby-sitter, 5=other	1.19 (.45)	1.32 (.74)	z=0.570 p=0.567 Fisher's exact=1.000
School performance reported by the parents 1=well above the average; 2= above the average; 3=	**Males + Females** 2.64 (.57)	**Males + Females** 2.96 (.64)	z=2.143 p=0.032 Fisher's exact=0.102

average; 4=below the average; 5=well below the average	**Males** 2.60 (.64) **Females** 2.72 (.46)	**Males** 2.95 (.49) **Females** 2.96 (.76)	 z=2.018 p=0.044 z=0.942 p=0.346
Having a weekly allowance 1=yes; 0=no	0.04 (.20)	0.05 (.24)	z=0.942 p=0.346
Use of the PC alone 1=yes; 0=no	0.32 (.47)	0.33 (.48)	z=0.142 p=0.887
Minutes at the PC per day	47 (17)	56 (51)	z=0.110 p=9125
TV alone 1=yes; 0=no	0.60 (.50)	0.58 (.50)	z=0.110 p=9125
Minutes at the PC per day	76 (31)	84 (57)	z=0.110 p=9125
Participation in individual activities 1=yes; 0=no	1.45 (.50)	1.42 (.50)	z=0.335 p=0.738
Participation in group activities 1=yes; 0=no	**Males + Females** 0.76 (.43) **Males** 0.79 (.42) **Females** 0.72 (.46)	**Males + Females** 0.41 (.50) **Males** 0.55 (.51) **Females** 0.30 (.47)	**Males + Females** z=3.461 p=0.006 z= 1.790 p=0.074 z=2.774 p=0.006

References

Abbink, K., Masclet, D., & Van Veelen, M. (2011). Reference point effects in antisocial preferences. *CIRANO-Scientific Publications*, *2011s*(11).

Aloise-Young, P. A. (1993). The Development of Self-Presentation: Self-Promotion in 6- to 10-Year-Old Children. *Social Cognition*. doi:10.1521/soco.1993.11.2.201

Andreoni, J., & Bernheim, B. D. (2009). Social Image and the 50-50 Norm: A Theoretical and Experimental Analysis of Audience Effects. *Econometrica*, *77*(5), 1607–1636. doi:10.3982/ECTA7384

Andreoni, J., & Petrie, R. (2004). Public goods experiments without confidentiality: a glimpse into fund-raising. *Journal of Public Economics*, *88*(7-8), 1605–1623. doi:10.1016/S0047-2727(03)00040-9

Ball, S., & Eckel, C. (2001). Status in markets. *The Quarterly Journal of Economics*, *116*(1), 161–188.

Banerjee, R. (2002). Audience Effects on Self-Presentation in Childhood. *Social Development*, *11*(4), 487–507.

Barclay, P., & Willer, R. (2007). Partner choice creates competitive altruism in humans. *Proceedings of the Royal Society B Biological Sciences*, *274*(1610), 749–753.

Bennett, M., & Yeeles, C. (1990). Children's Understanding of Showing Off. *The Journal of Social Psychology*, *130*(5), 591–596.

Blake, P., Piovesan, M., Montinari, N., Warneken, F., & Gino, F. (2014). *Prosocial norms in the classroom: The roles of planning and impulsivity*.

Blake, P. R., & McAuliffe, K. (2011). "I had so much it didn't seem fair": Eight-year-olds reject two forms of inequity. *Cognition*, *120*(2), 215–224. doi:10.1016/j.cognition.2011.04.006

Bolle, F., Tan, J. H. W., & Zizzo, D. J. (2010). *Vendettas*.

Brañas-Garza, P., Cobo-Reyes, R., Espinosa, M. P., Jiménez, N., Kovářík, J., & Ponti, G. (2010). Altruism and social integration. *Games and Economic Behavior*, *69*(2), 249–257. doi:10.1016/j.geb.2009.10.014

Charness, G., Masclet, D., & Villeval, M.-C. (2013). *The Dark Side of Competition for Status*.

Charness, G., Rigotti, L., & Rustichini, A. (2003). *They are watching you: Social facilitaton in institutions*.

Chen, J., & Houser, D. (2012). Non-human Primate Studies Inform the Foundations of Fair and Just Human Institutions. *Social Justice Research*, *25*(3), 277–297.

Cillessen, A. H. N., & Lansu, T. A. M. (2011). Popularity and Social Status. In B. Brown & M. J. Prinstein (Eds.), *Encyclopedia of Adolescence* (pp. 260–268). San Diego: Academic Press. doi:10.1016/B978-0-12-373951-3.00080-6

Cillessen, A. H. N., & Mayeux, L. (2004). From censure to reinforcement: Developmental changes in the association between agreesion and social status. *Child Development*, *75*, 147–163.

Congleton, R. D. (1989). Efficient status seeking: externalities, and the evolution of status game. *Journal of Economic Behavior & Organization*, *11*(2), 175–190.

Conti, G., Galeotti, A., Muller, G., & Pudney, S. (2013). Popularity. *The Journal of Human Resources*, *48*(4), 1072–1094.

Damon, W. (1977). *The social world of the child*. San Francisco: Jossey-Bass.

Dana, J., Weber, R., & Kuang, J. (2007). Exploiting moral wiggle room: experiments demonstrating an illusory preference for fairness. *Economic Theory*, *33*(1), 67–80. doi:10.1007/s00199-006-0153-z

De Cremer, D., & Sedikides, C. (2008). Reputational implications of procedural fairness for personal and relational self-esteem. *Basic and Applied Social Psychology*, *30*(1), 66–75.

De Waal, F. B. M., & Suchak, M. (2010). Prosocial primates: selfish and unselfish motivations. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, *365*(1553), 2711–22. doi:10.1098/rstb.2010.0119

Fehr, E., Bernhard, H., & Rockenbach, B. (2008). Egalitarianism in young children. *Nature*, *454*(7208), 1079–83. doi:10.1038/nature07155

Fershtman, C., & Weiss, Y. (1993). Social Status, culture and economic performance. *The Economic Journal*, *103*(419), 946–959.

Geraci, A., & Surian, L. (2011). The developmental roots of fairness: infants' reactions to equal and unequal distributions of resources. *Developmental Science*, *14*(5), 1012–1020. doi:10.1111/j.1467-7687.2011.01048.x

Gifford-Smith, M. E., & Brownell, C. A. (2003). Childhood peer relationships: Social acceptance, friendships, and peer networks. *Journal of School Psychology*.

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: a research note. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *38*(5), 581–586. doi:10.1097/00004583-200111000-00015

Harrison, G. W., & List, J. A. (2004). Field Experiments. *Journal of Economic Literature*, *42*(4), 1009–1055. doi:10.1007/BF00033247

Hoffman, E., McCabe, K., & Smith, V. (1996). Social distance and other-regarding behavior in dictator games. *The American Economic Review*, *86*(3), 653–660.

Hook, J. G., & Cook, T. D. (1979). Equity theory and the cognitive ability of children. *Psychological Bulletin*. doi:10.1037/0033-2909.86.3.429

Horner, V., Carter, J. D., Suchak, M., & de Waal, F. B. M. (2011). Spontaneous prosocial choice by chimpanzees. *Proceedings of the National Academy of Sciences of the United States of America*, *108*(33), 13847–51. doi:10.1073/pnas.1111088108

Houser, D., Montinari, N., & Piovesan, M. (2012). Private and public decisions in social dilemmas: evidence from children's behavior. *PloS One*, *7*(8), e41568. doi:10.1371/journal.pone.0041568

Kagel, J. (1996). Fairness in Ultimatum Games with Asymmetric Information and Asymmetric Payoffs. *Games and Economic Behavior*, *13*(1), 100–110. doi:10.1006/game.1996.0026

Kozlowski, S. W. J., & Bell, B. S. (2003). Work groups and teams in organizations. In W. C. Borman, D. R. Ilgen, & R. J. Klimoski (Eds.), *Handbook of psychology: Industrial and organizational psychology, Vol. 12* (pp. 333–375). New York: Wiley.

LaFontana, K. M., & Cillessen, A. H. N. (1999). Children's interpersonal perceptions as a function of sociometric and peer-perceived popularity. *Journal of Genetic Psychology*, *160*, 225–242.

LaFontana, K. M., & Cillessen, A. H. N. (2002). Children's perceptions of popular and unpopular peers: A multimethod assessment. *Developmental Psychology*, *38*(5), 635–647. doi:10.1037//0012-1649.38.5.635

Larson, T., & Capra, C. M. (2009). Exploiting moral wiggle room : Illusory preference for fairness ? A comment. *Judgment and Decision Making*, *4*(6), 467–474.

Layous, K., Nelson, S. K., Oberle, E., Schonert-Reichl, K. a, & Lyubomirsky, S. (2012). Kindness counts: prompting prosocial behavior in preadolescents boosts peer acceptance and well-being. *PloS One*, *7*(12), e51380. doi:10.1371/journal.pone.0051380

Lazear, E. P., Malmendier, U., & Weber, R. A. (2012). Sorting in experiments with application to social preferences. *American Economic Journal: Applied Economics*, *4*(1), 136–163.

Leimgruber, K. L., Shaw, A., Santos, L. R., & Olson, K. R. (2012). Young Children Are More Generous when Others Are Aware of Their Actions. *PLoS ONE*, *7*(10).

Levitt, S. D., & List, J. A. (2007). What Do Laboratory Experiments Measuring Social Preferences Reveal About the Real World? *Journal of Economic Perspectives*, *21*(2), 153–174. doi:10.1257/jep.21.2.153

Maggian, V., & Villeval, M. C. (2013). *Social Preferences and Lying Aversion in Children*.

Milinski, M., Semmann, D., & Krambeck, H.-J. (2002). Donors to charity gain in both indirect reciprocity and political reputation. *Proceedings of the Royal Society B Biological Sciences*, *269*(1494), 881–883.

Murnighan, J. K., & Saxon, M. S. (1998). Ultimatum bargaining by children and adults. *Journal of Economic Psychology*.

Newcomb, A. F., Bukowski, W. M., & Pattee, L. (1993). Children's peer relations: a meta-analytic review of popular, rejected, neglected, controversial, and average sociometric status. *Psychological Bulletin*, *113*(1), 99–128.

Olson, K. R., & Spelke, E. S. (2008). Foundations of cooperation in young children. *Cognition*, *108*(1), 222–231.

Parkhurst, J. T., & Hopmeyer, A. (1998). Sociometric popularity and peer-perceived popularity: Two distinct dimensions of peer status. *Journal of Early Adolescence*, *18*, 125–144.

Prinstein, M. J., & Cillessen, A. H. N. (2003). Forms and functions of adolescent peer aggression association with high levels of peer status. *Merrill-Palmer Quarterly: Journal of Developmental Psychology*, *49*(310-342).

Proctor, D., Williamson, R. a, de Waal, F. B. M., & Brosnan, S. F. (2013). Chimpanzees play the ultimatum game. *Proceedings of the National Academy of Sciences of the United States of America*, *110*(6), 2070–5. doi:10.1073/pnas.1220806110

Rubin, K. H., Bukowski, W. M., & Parker, J. G. (2006). Peer interactions, relationships and groups. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology, Vol 3. Social, emotional, and personality development* (pp. 571–645). NJ: John Wiley: Hoboken.

Schmidt, M. F. H., & Sommerville, J. A. (2011). Fairness Expectations and Altruistic Sharing in 15-Month-Old Human Infants. *PLoS ONE*. doi:10.1371/journal.pone.0023223

Schram, A., & Charness, G. (2012). *Social and Moral Norms in the Laboratory*.

Schwartz, D. (2000). Subtypes of Victims and Aggressors in Children's Peer Groups. *Journal of Abnormal Child Psychology*, *28*(2), 181–192.

Scott, B. a, & Judge, T. a. (2009). The popularity contest at work: who wins, why, and what do they receive? *The Journal of Applied Psychology*, *94*(1), 20–33. doi:10.1037/a0012951

Shaw, A., Montinari, N., Piovesan, M., Olson, K. R., Gino, F., & Norton, M. I. (2013). Children Develop a Veil of Fairness. *Journal of Experimental Psychology. General*. doi:10.1037/a0031247

Shaw, A., & Olson, K. R. (2012). Children discard a resource to avoid inequity. *Journal of Experimental Psychology: General*. doi:10.1037/a0025907

Sigelman, C. K., & Waitzman, K. A. (1991). The development of distributive justice orientations: contextual influences on children's resource allocations. *Child Development*, *62*(6), 1367–1378. doi:10.2307/1130812

Slaughter, V., Imuta, K., Peterson, C. C., & Henry, J. D. (2015). Meta-Analysis of Theory of Mind and Peer Popularity in the Preschool and Early School Years. *Child Development*, n/a–n/a. doi:10.1111/cdev.12372

Sloane, S., Baillargeon, R., & Premack, D. (2012). Do Infants Have a Sense of Fairness? *Psychological Science*. doi:10.1177/0956797611422072

Woolley, A. W., Chabris, C. F., Pentland, A., Hashmi, N., & Malone, T. W. (2010). Evidence for a collective intelligence factor in the performance of human groups. *Science (New York, N.Y.)*, *330*(6004), 686–688.

Wright, M., Li, Y., & Shi, J. (2012). Chinese Adolesents's Social Status Goals: Associations with Behaviors and Attributions for Relational Aggression. *Youth Society*, *XX*(X), 1–23.

Xie, H., Swift, D. J., Cairns, B., & Cairns, R. B. (2002). Aggressive behaviors in social interaction and developmental adaptation: A narrative analysis of interpersonal conflicts during early adolescence. *Social Development*, *11*, 205–224.

Zarbatany, L., Hartmann, D. P., & Gelfand, D. M. (1985). Why does children's generosity increase with age: susceptibility to experimenter influence or altruism? *Child Development*, *56*(3), 746–756.

Zizzo, D. J. (2003). Money burning and rank egalitarianism with random dictators. *Economics Letters*, *81*(2), 263–266.

Zizzo, D. J., & Oswald, A. (2001). Are People Willing to Pay to Reduce Others ' Incomes ? *Journal of Public Economics*, *41*(63), 1–41. doi:10.1017/S0266462300006280

Zwaan, M., Dijkstra, J. K., & Veenstra, R. (2013). Status Hierarchy, attractiveness hierarchy and sex ratio: Three contextual factors explaining the status-aggression link among adolescents. *International Journal of Behavioral Development*, *xx*(x), 1–11.