Beware Of Popular Kids Bearing Gifts: A Framed Field Experiment

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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 a child's 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.

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

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I. Introduction

A substantial literature in psychology suggests that there is 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, 2010a; 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 do not have a greater preference for prosociality, but rather are 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. This paper reports experiments that examine the effect of popularity on prosociality (sharing decisions) in children aged six to twelve in both public and private environments. We find popularity to have a significant and positive effect on public, but not private, generosity; age appears to have a significant and positive effect in both public and private contexts; popularity and age have a significant and positive interaction effect only in public environments. Our results help to explain the observation that people behave more generously in public[2] (see, for example, Andreoni & Petrie, 2004; Hoffman, McCabe *et al*., 1998). 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 their prosociality using a dictator game variant, and then later elicit the child's popularity (see Section II for the details regarding the way we construct the

[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.

[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 increased confidentiality gives rise to greater generosity in fund-raising.

popularity index). Further, we vary the visibility of decisions in the dictator game: Private (anonymous decisions) or Public (decisions are known by all participants). We consider this contrast to explore whether popular people are innately more pro-social than other, as suggested by the literature above, or rather whether their prosociality is mediated by the decision-making context.

The advantage of conducting this study in the school with children rather than in the laboratory with "standard" subjects is twofold: First, we can exploit a natural network rather than exogenously creating it in the laboratory. Second, we are able to capture arguably the most important network of friendship in the child's life: the reason is that between 6 and 12, children spend most of their day at school. For most children, the network of friends they have at school is the only one they have.

This line of research raises many important implications in public decision-making circumstances. One such area is charitable giving. Much of the charitable giving literature focuses on designing one-size-fits-all incentives that can be applied to the entire donor base. An alternative is to conduct campaigns targeted specifically at those who are likely to respond most strongly to the initiative. Our findings suggest that it may be fruitful and potentially cost effective to conduct donation drives specifically targeted towards those 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 especially valuable to ensure elected officials make their decisions in public. Finally, our results help to explain why some people, but not all, become more generous in public decision contexts.[3]

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.

[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.

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 (*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). In addition, being popular can lead to large fortunes. For example, celebrity endorsements are common practice in consumer business: Beyonce recently signed an endorsement deal with Pepsi for $50 million dollars[4].

[4] For more stories about the celebrity endorsement deals, please refer to http://variety.com/2013/music/features/endorsement-deals-1200334594/

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).

Few economic studies investigate 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.

A study related to ours was reported by Brañas-Garza et al. (2010). The authors elicited the social network of a section of undergraduate students and then required them to make decisions in a standard dictator game (where decisions are anonymous and in private). Brañas-Garza et al. (2010) found that more socially integrated[5] people were more altruistic toward other participants in the same session. This result, however, may be capturing a form of indirect reciprocity: the more socially integrated individuals are more generous since they are more likely to benefit from the generosity of the other participants in the same session. Different from Brañas-Garza et al. (2010), the generous behaviors in our experiment do not benefit other individuals participating in the same

[5] Social integration is measured by the network concepts of "reciprocal degree" and "betweenness centrality". See their paper for details.

session[6]. Therefore, we exclude any concern of ingroup preferences by design. Moreover, note, of course, that "socially integrated" people may not be more popular. For example, a person could be well-connected to many people, and yet none of those people may consider that person as one of those with whom they would prefer to spend time. 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 *et al*., 2003; 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., 2013). 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).

[6] As detailed in Section IV, the children participants in our experiment were informed that they are donating their silly bands to children from different classes.

H2: Older children in public environments display greater generosity than older children in private environments, or younger children in either public or private environments (Main Age Effect).

People develop social preferences: they prefer sharing and fairness to selfish alternatives[7]. As children grow older, they develop an innate sense of caring about others and egalitarian preferences (Fehr et al., 2008). Older children also have a better understanding and ability to use theory-of-mind reasoning, 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 then 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. (2013) suggest that as

[7] 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).

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.

In light of the hypotheses, we only report the one-sided tests for non-parametric tests below.

IV. Experimental Design and Procedure

Participants. The experimental sessions were conducted in March 2012. Our participants were 231 children (109 females[8]), 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).

Procedures. Children participated in a Dictator Game[9]: each child received 4 colored rubber bands[10]. The children then had to decide how many rubber bands to donate to another real, but anonymous, child from another participating, anonymous class. 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[11]. Upon return to the classroom, they handed the envelope to the experimenter

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

[9] 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).

[10] We used silly bands because they are popular among 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 used silly bands as an effective incentive for children in primary schools (see, e.g., Houser *et al*., 2012; Maggian & Villeval, 2013).

[11] Children may be more likely to donate damaged silly bands or those with shapes or colors they do not prefer. To address this, all children were told that at the end of the experiment they could trade bands with

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).

Each classroom was randomly assigned to either the private or public treatment, and this assignment was held constant throughout the experiment[12]. 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 (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")[13]. Each child 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

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their classmates or with the experimenter (who effectively acted as a silly band bank). Such exchanges were uncommon. Finally, note that while differences in the desirability of silly bands might increase the overall level of sharing, this effect would be common across treatments and thus cannot impact our conclusions regarding the effect of popularity or age on generosity.

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

[13] 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 silly 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 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).

would know which names they wrote. Children received a rubber band for their collaboration.

Using the names 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 (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.

V. Results

Popularity Elicitation Protocol Using the data collected from the "Seating Map,[14]", we constructed a popularity index for each kid i in his/her class[15]. We first counted the number of children in one class who indicated a particular child in their "Seating Map";

[14]The seating map used is reproduced in Figure A1.2 in the Appendix.

[15] 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.

we then created a popularity count following the rule of Borda Counts[16]. 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 1. 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 1 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). The "Max" statistic shows the maximum number of children who participated in the experiment among all classes included in each treatment.

The Dictator Game

Overview of the sharing decisions On average, children shared more in Public, around 1.46 silly bands out of 4, while they only shared about 1.19 silly bands in Private. Table 2 below shows the percentage of children sharing 0 to 4 silly 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 selfishly sharing 0.

[16] 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 ranked lower than them, such that a candidate received $n - 1$ points for a first preference; $n - 2$ for a second; and so on, with zero points for being ranked last (or left unranked). The number of candidates is the number of kids in a class, including those who did not participate in the experiment but still appear in the "Seating Map" names.

Table 2. Sharing Decisions Across Treatments

	% of Children In Each of The Category	
Number of Silly 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%)

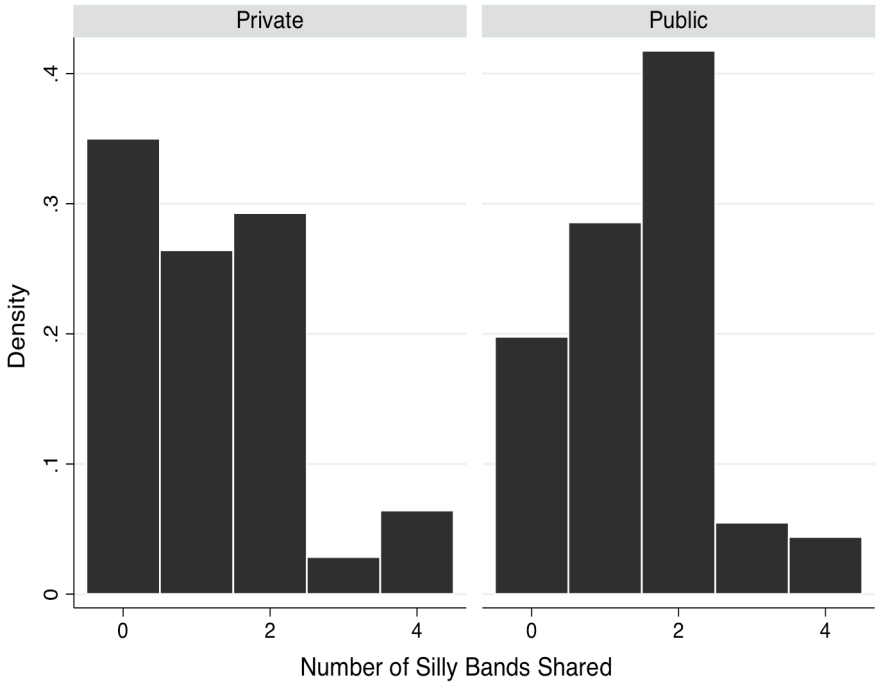


Figure 1. Histogram of Sharing Decisions Across Treatments

Popularity effect on Sharing in public vs. private treatment

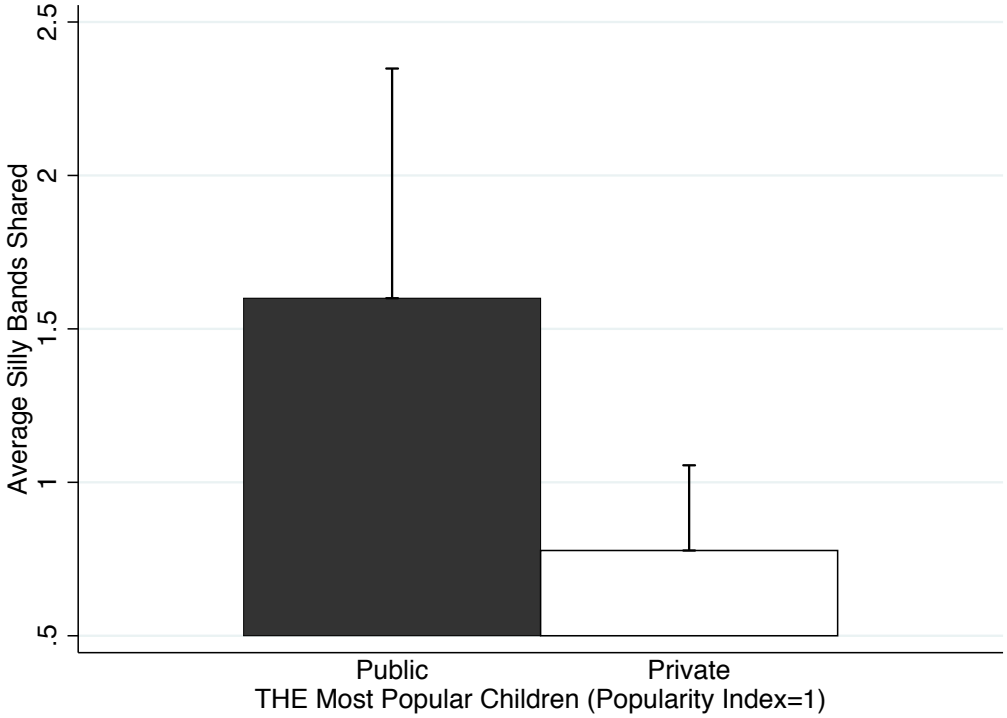


Figure 2. Average Sharing: The Most Popular Children (Popularity Index=1)

Error bars indicate mean + s.e.m for all the figures.

Figure 2 above provides the first evidence of 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 behave more generously in Public than in Private while less popular children don't differ much in sharing both in Public and Private.

From Figure 2, we can see that the most popular children share more in Public (1.6) than Private (0.78), although the difference is not statistically significant (p=.18) due to the low number of observations.

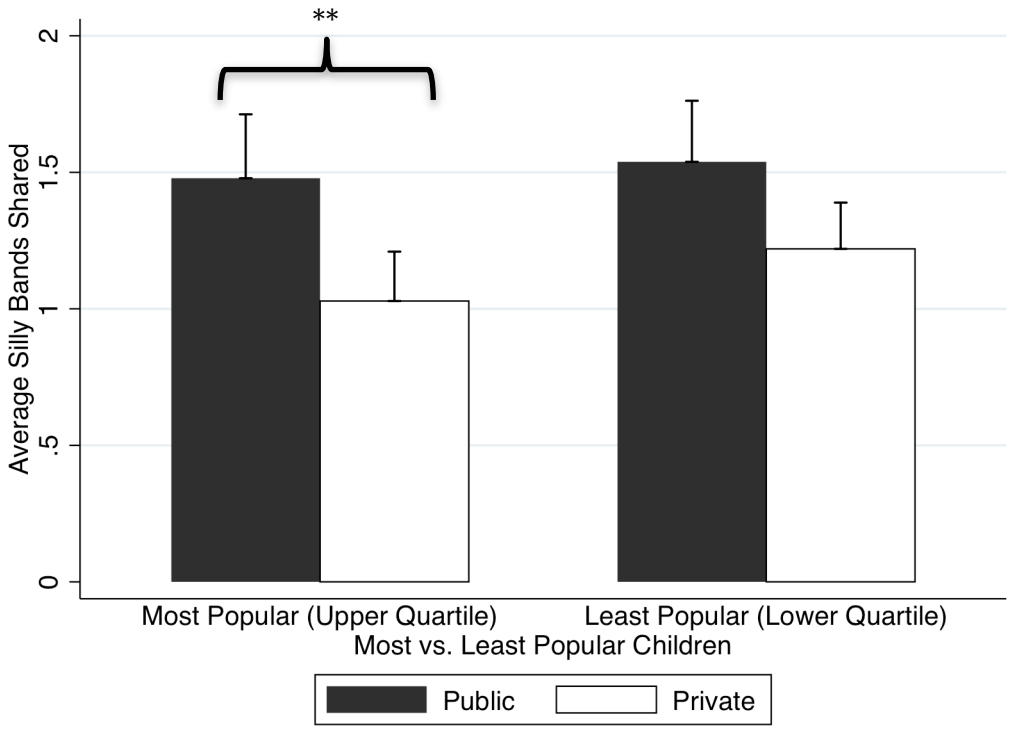


Figure 3. Average Sharing: Most Popular vs. Least Popular Children
** indicates p<.05, one-tailed tests.

Figure 3 compares the average number of silly bands shared between the most and least popular children. The most popular children (those who are ranked among the upper quartile) gave away on average 1.48 silly bands in the Public treatment, and only 1.03 silly bands in the Private treatment (p = .05). The least popular children (those who are ranked at the lower quartile) shared 1.54 silly bands with the matched anonymous partner in Public, which is not significantly different from the number of silly bands shared in Private (p = .13)[17].

[17] We investigated alternative ways to identify more and less popular children. The pattern detailed in Figure 4 holds comparing children ranked in the upper third of the popularity index with the ones who are ranked at the lower third of the popularity index. The more popular kids share more in Public and less in Private, while the less popular kids behave more similarly in both Public and Private, although the differences are less obvious.

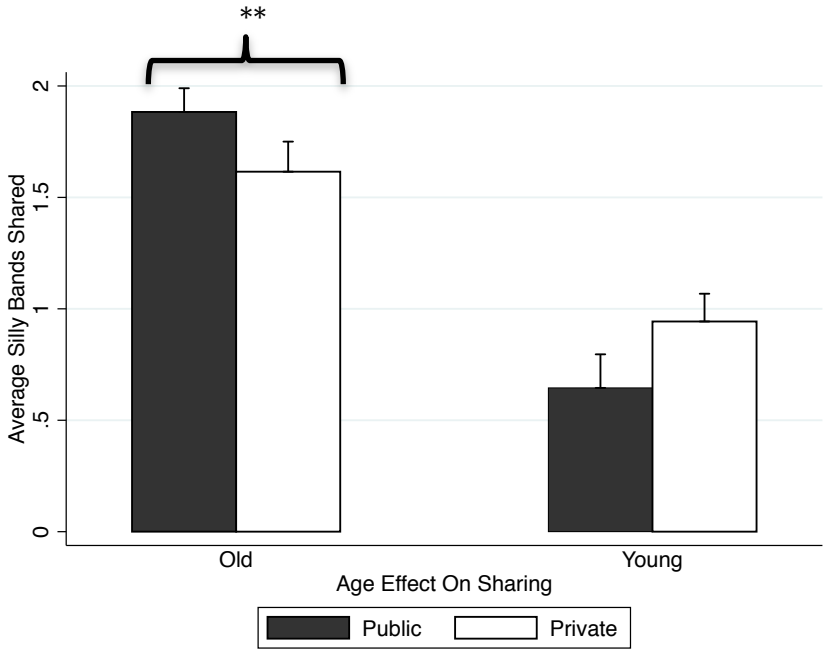


Figure 4. Average Sharing: Old vs. Young Children
* indicates $p<0.05$, one-tailed tests.

Figure 4 above lends support to our second hypothesis: *older children in Public display greater generosity than: (i) older children in Private; or (ii) younger children in either Public or Private*.

To see (i), note that mean sharing in Public is significantly greater for older Children than in Private ($p = .03$). To see (ii), note that older children in Public share on average 1.88 silly bands. This is significantly more than young children in both Public and Private ($p < .01$ and $p < .01$, respectively).

Figure 5 and Table 4 below lend support for our third hypothesis: *1) In Public: older and more popular children share more than: (i) less popular older children; and (ii) younger children regardless of popularity; 2) In Private: there is no effect of popularity for children of any age*. To see 1i), note from Figure 6 that older and more popular children share more than half of their endowment in Public, while their less popular but same-aged counterparts share (an insignificantly different) 1.82 silly bands.

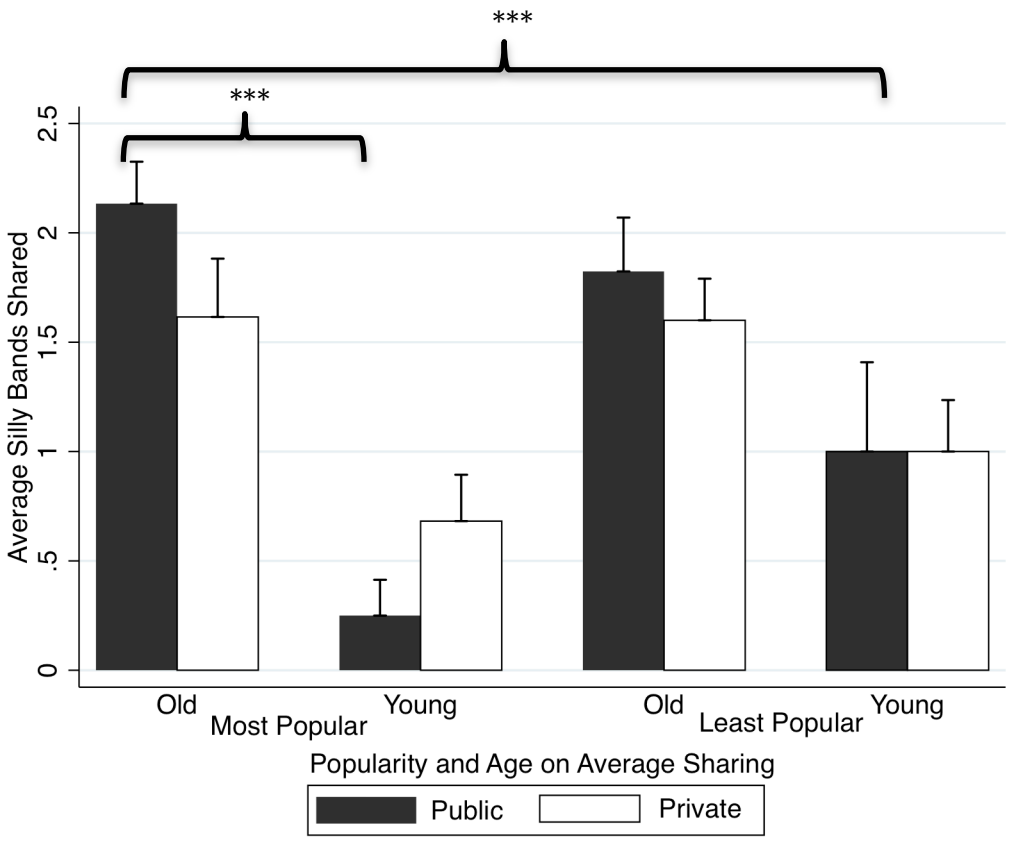


Figure 5: Age and Popularity Effect On Average Sharing
*** indicates p<0.01, one-tailed tests.

The younger and more popular children share about .25 silly bands, and the younger and less popular share about one silly band, both of which are significantly less than the amount shared by the older and more popular children ($p < .01$). With respect to 2), note that, in Private, young children with different popularity behave statistically similarly, as do older children with different popularity ($p = .34$ and $p = .82$, respectively).

Table 4. Non-Parametric Tests for the Effect of Popularity and Age on Average Donation

	Public	**Private**	**Public vs Private**[18] p-value
THE Most Popular Children (Popularity Index =1)	1.6 (.75) N=5	0.78 (.28) N=9	0.18
Old Children	1.88 (.11) N=60	1.62 (.13) N=52	0.03**
Young Children	0.65 (.15) N=31	.94 (.12) N=88	0.18
Most Popular Children (Upper Quartile)	1.48 (.23) N=23	1.03 (.18) N=35	0.05**
OLD (in grade 3-5)	2.13 (.19) N=15	1.62 (.27) N=13	0.03**
YOUNG (in grade 1-2)	.25 (.16) N=8	.68 (.21) N=22	0.13
Least Popular Children (Lower Quartile)	1.54 (.22) N=26	1.22 (.17) N=41	0.13
OLD (in grade 3-5)	1.82 (.25) N=17	1.6 (.19) N=15	0.23
YOUNG (in grade 1-2)	1 (.24) N=9	1 (.41) N=26	0.49

Standard Error reported in the parenthesis, **, *** indicate 5%, 1% significance level, one-sided test.

Next, Table 5 reports the regression results.

Our Probit Regression model is specified as follows:

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

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

$$+\beta_6 * Public * Popularity_i + \beta_7 * Public * age_i + \beta_8 * Public * male + \beta_9 * Public * Prosocial \quad (3)$$

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

Where $Sharing_i = 1$ if number of silly bands shared ≥ 2

$= 0$ if number of silly bands shared < 2 ;

$Public$ is the dummy variable for Public treatment, $= 1$, if it is Public Treatment, $= 0$ if it is Private Treatment;

[18] We here performed the Mann Whitney test. Here we report one-sided test p-values.

$Popularity_i$ = − Popularity index for child i, the higher the value the more popular child i is;

Age_i = Age of child i;

$Male_i$= 1 if child i is male, 0 otherwise;

$Prosocial_i$ indicates the Prosociality score obtained in the SDQ[19] for child i.

Note that 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, in Public 51% of our participants sharing two or more silly-bands, while 49% share 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 (please refer to Figure 1 and Table 2). Consequently, some type of aggregation is unavoidable when performing our analysis, and the procedure we adopted seems natural. Alternative specifications do not substantively change our results.

From the regression (1) reported in Table 5 below, we can see that the Public treatment is not significantly different than the Private treatment (p=.41).

In regression (2), we look at both the treatment effect and also the main effects: popularity does not have an effect on overall sharing decisions. Age has a significant and positive effect on sharing probabilities: a child one year older is 17% more likely to share (everything else equal). 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.

[19] 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.

Table 5. Probit Regression Results

	Sharing							
Variables	Coefficients				Marginal Effects			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Const.	-.29*	-4.97***	-3.22**	-3.96				
	(.16)	(1.27)	(1.34)	(2.87)				
Public	.33	.13	-6.38***	-10.85***	.13	.05	-.99***	-.99***
	(.40)	(.29)	(1.76)	(3.33)	(.16)	(.11)	(.02)	(.00)
Popularity		-.001	-.02	-.09		-.0005	-.006	-.03
		(.02)	(.02)	(.19)		(.007)	(.01)	(.07)
Public×Popularity			.06*	-.41			.02	-.16
			(.03)	(.25)			(.01)	(.10)
Age		.45***	.30***	.38		.17***	.11***	.14
		(.10)	(.08)	(.25)		(.04)	(.03)	(.10)
Public×Age			.56***	1.02***			.21***	.39***
			(.18)	(.34)			(.07)	(.14)
Popularity×Age				.008				.003
				(.02)				(.008)
Public×Popularity × Age				.05				.02
				(.03)				(.01)
Male		-.23	-.35	-.34		-.08	-.13	-.13
		(.21)	(.24)	(.25)		(.08)	(.09)	(.10)
Public×Male			.34	.45			.13	.18
			(.41)	(.43)			(.16)	(.17)
Prosocial		.10	.03	.04		.04	.01	.02
		(.06)	(.07)	(.08)		(.03)	(.03)	(.03)
Public×Prosocial			.22**	.21*			.08**	.08*
			(.11)	(.11)			(.04)	(.04)
N	231	182	182	182				
Pseudo R2	0.01	0.19	0.24	0.25				

Standard errors are in the parenthesis. Errors are clustered at group level. ***,**,* indicate significant level at p=.01,.05, .10, respectively .

In regression (3), we focus on the interaction effects of population and age in Public and Private: popularity has a significant and positive effect on the sharing probability only in Public ($p = .04$). However, this effect is not seen in Private ($p= .57$), which suggests that more popular kids are more likely to share in Public. Nonetheless, in actuality, they are no more generous than in Private. On the other hand, less popular kids behave more similarly between Public and Private. Indeed, children ranked first are 20% more likely to share than children ranked eleventh in Public, although a first ranked child is no more likely to share than a child ranked eleventh when sharing occurs in Private. Additionally, age has a significant and positive impact on both Public and Private treatments ($p < .01$ and $p < .01$, respectively). Pro-social tendencies play a significant and positive role in

Public ($p < .01$), but not in Private treatments ($p = .73$). A one-point increase in pro-social measurement brings about 8% increases in sharing probabilities[20].

In regression (4), we discuss interaction effects of popularity and age on sharing probabilities. 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 ($p= .63$). 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.

VI. Conclusions and Discussion

This paper explores relationships among popularity, age and pro-social behaviors in children. Our results show that popular children display more prosociality in public than in private settings, while the behavior of less popular children does not vary across these contexts. 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 may not be 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 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.

[20] The reason for the difference between Public and Private may be connected to the pro-social measurement questionnaire, which focused on public prosociality.

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. Another limitation is that our study does not establish a causal link between popularity and prosociality, nor did we intend to do so. For example, it may be that people better at presenting themselves become popular. Alternatively, popular people may experience greater pressure to perform pro-socially in public, but then revert to behavioral patterns consistent with those of less popular people when this pressure is absent. It would be especially profitable for future research to address this issue.

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 silly bandz. Now , each of you can decide if he wants to share his silly bandz 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 silly bandz 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 silly bandz 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 silly bandz to another child, just put it in the envelope. Put the silly bandz 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)].*

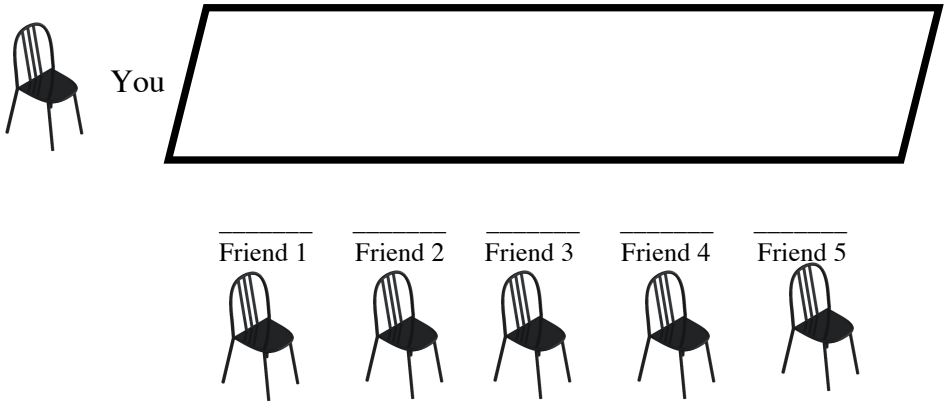
TREATMENT: Public vs. Private
[*Public: say the following sentence*:] After you have made your choice, we will open the envelopes in front of everyone and write on the board what has chosen each one of you so that everyone can see what you have decided.
[Private: *say the following sentence*:] Your choice 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 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.2.1: Kernel Density Estimate of the Friends 1 Nomination For Most Popular Children By Treatment

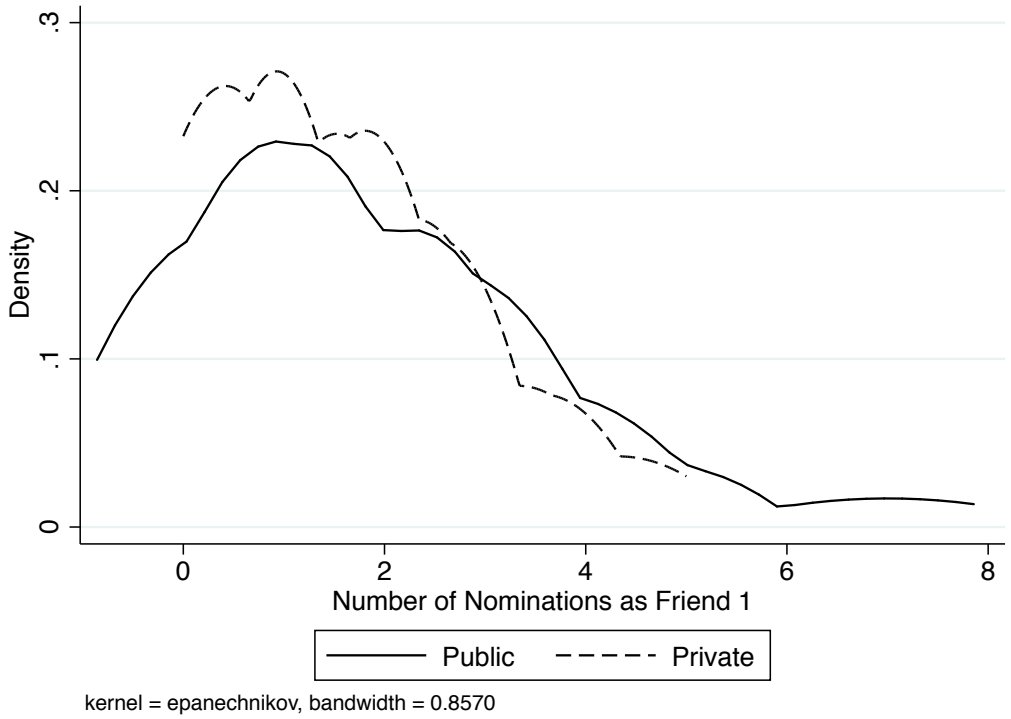


Figure A.2.2: Kernel Density Estimate of the Friends 2 Nomination For Most Popular Children By Treatment

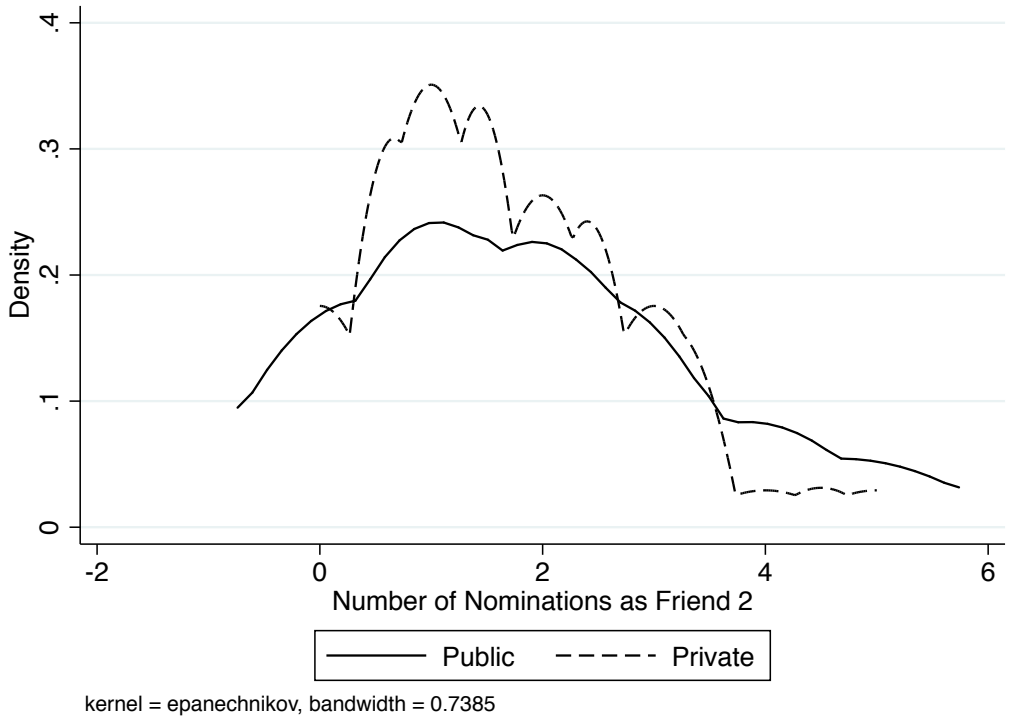


Figure A.2.3: Kernel Density Estimate of the Friends 3 Nomination For Most Popular Children By Treatment

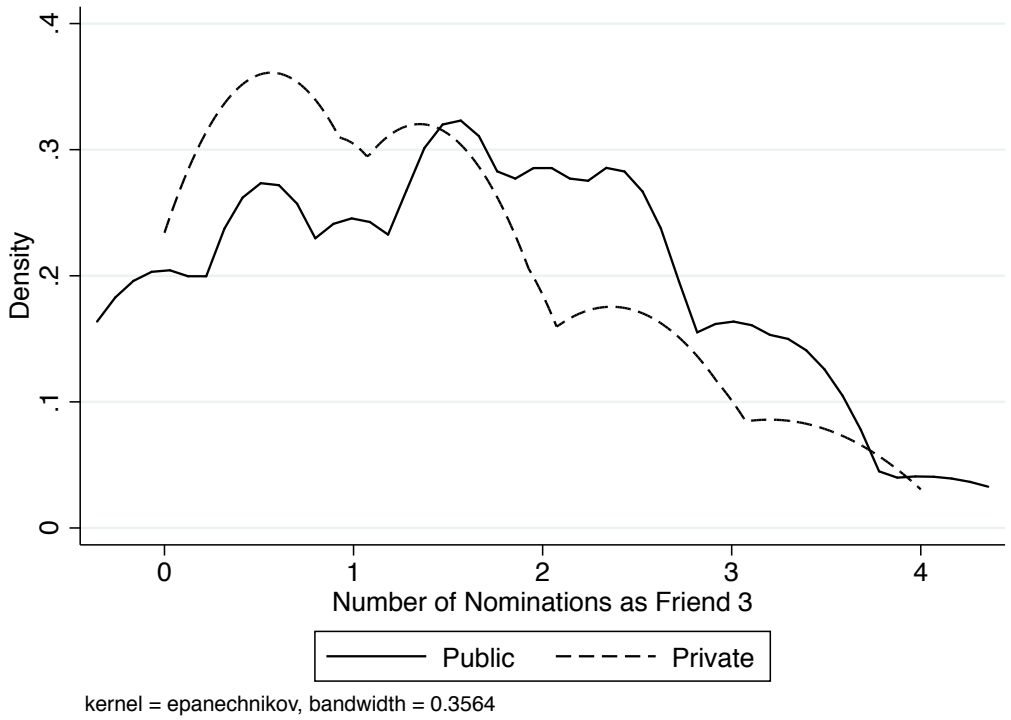


Figure A.2.4: Kernel Density Estimate of the Friends 4 Nomination For Most Popular Children By Treatment

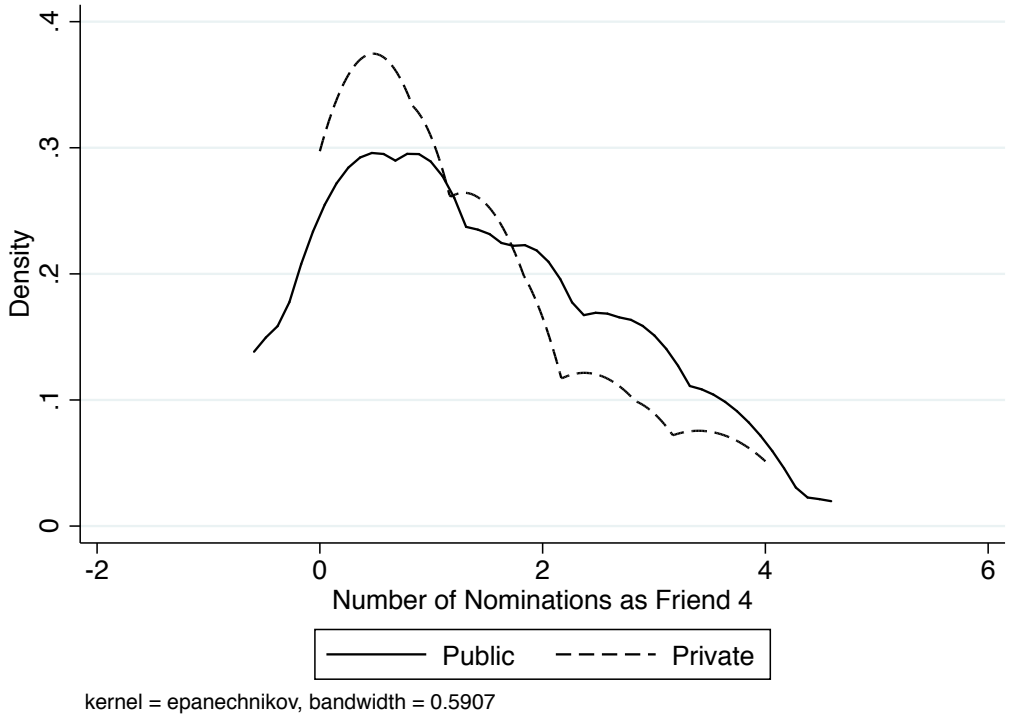
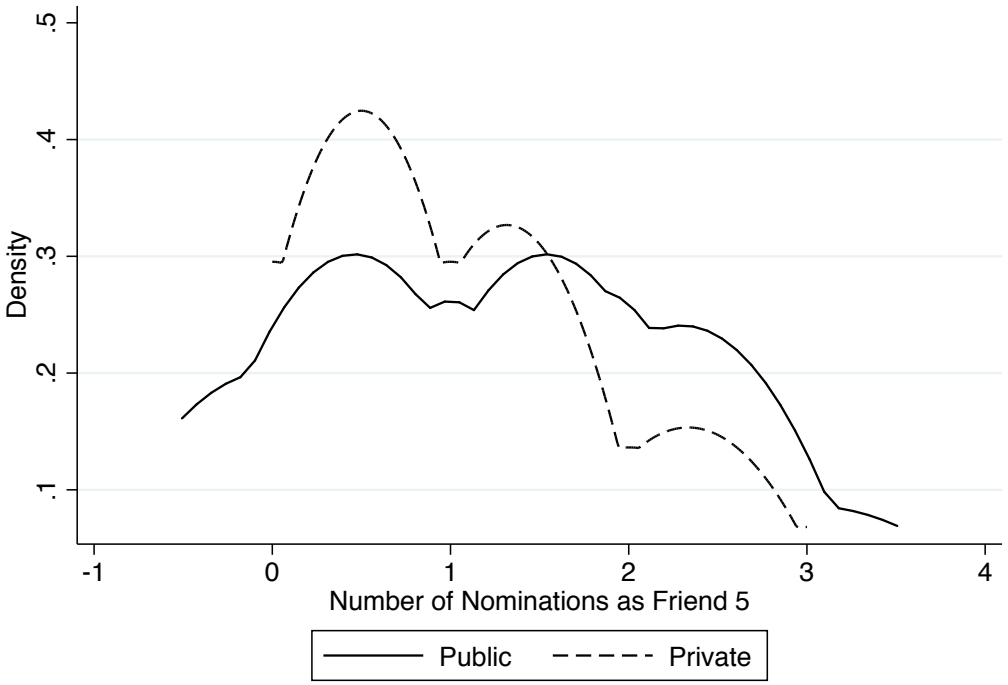


Figure A.2.5: Kernel Density Estimate of the Friends 5 Nomination For Most Popular Children By Treatment


Density
.1
.2
.3
.4
.5
-1
0
1
2
3
4
Number of Nominations as Friend 5
Public
Private
kernel = epanechnikov, bandwidth = 0.5066

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. Retrieved from http://qje.oxfordjournals.org/content/116/1/161.short

Banerjee, R. (2002). Audience Effects on Self-Presentation in Childhood. *Social Development*, *11*(4), 487–507. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/1467-9507.00212/full

Barclay, P., & Willer, R. (2007). Partner choice creates competitive altruism in humans. *Proceedings of the Royal Society B Biological Sciences*, *274*(1610), 749–753. Retrieved from http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2197220&tool=pmcentrez&rendertype=abstract

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. Retrieved from http://dx.doi.org/10.1080/01973530701866557

De Waal, F. B. M., & Suchak, M. (2010a). 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

De Waal, F. B. M., & Suchak, M. (2010b). 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

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. A., & Smith, V. L. (1998). behavioral foundation of reciprocity: experimental econimics and evolutionary psychology. *Economic Inquiry*, *36*(3), 335–352. Retrieved from http://onlinelibrary.wiley.com/doi/10.1002/cbdv.200490137/abstract

Hoffman, E., McCabe, K., & Smith, V. (1996). Social distance and other-regarding behavior in dictator games. *The American Economic Review*, *86*(3), 653–660. Retrieved from http://www.jstor.org/stable/10.2307/2118218

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. Retrieved from http://mars.smu.edu.sg/SJDM/9814/jdm9814.pdf

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

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. Retrieved from http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1690974&tool=pmcentrez&rendertype=abstract

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. Retrieved from http://doi.apa.org/getdoi.cfm?doi=10.1037/0033-2909.113.1.99

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. Retrieved from http://www.springerlink.com/index/J715300532381861.pdf

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

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

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.

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.