Friendships and Favoritism on the Schoolground - A Framed Field Experiment*

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Abstract

This study presents evidence from a field experiment on the prevalence of favoritism at school among younger children (6-8 years old) and older children (10-12 years old). Children compete in teams in a tournament setting with two rounds. The task is a simple individual effort task - bring as many balls as possible from one basket to the other. The performance of the team is determined by the sum of all individual performances. After a first round where all team members participate, children are asked to report which group member they would prefer to do the task in the second round, for the benefit of the team. The chosen child would not only perform the task again, but would also receive an additional gift. We find that friends are more likely to be chosen than others, conditional on their performance in the first round. Performance is an important criterion for the older children, but not for the younger ones. While this suggests that the children favor their friends, we also find an offsetting effect: children who are favored increase their subsequent performance. These positive feedback effects might be the very reason why favors subsist as children grow older and performance concerns increase. These results also show the importance of observing performance ex-post (rather than ex ante) in order to draw conclusions about efficiency.

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1 Introduction

A growing body of controlled field and laboratory experiments shows that being socially well-connected matters in a variety of contexts. For example, Goeree et al. (2010) find that offers in a dictator game among teenagers are mainly driven by social distance - the length of the shortest path connecting two individuals - rather than any other individual demographics. Similar results are found for college students by Mobius et al. (2004) and Brañas-Garza et al. (2006). Friends

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also appear to be favored in situations where there are differences in merit or performance. For example, Bagues and Esteve-Volart (2009) document nepotism practices in the recruitment of high civil servants in Spain; and Bandiera et al. (2009a) present field experimental evidence of favoritism practices in a fruit-picking firm, and find that managers tend to favor their friends when it is costless for them to do so.

The identification of favoritism practices is usually challenging because measures of merit or performance are not always available; nor is the information about social ties between people. Moreover, the evaluation of the efficiency implications of favoritism practices is far from straightforward. There are a number of reasons why favors might actually be efficiency *enhancing*. Friends are typically embedded in long-term social networks and favors could arise in the context of repeated interactions and improve overall efficiency. Friends may be more loyal and put more effort into the task, and thereby reciprocate the favors. In a team work context, friendships could alleviate free rider problems (Calvó-Armengol and Jackson, 2009; Kandel and Lazear, 1992).

To determine whether favoritism exists – whether certain people are treated better than others on grounds that are not related to merit or performance – and whether it is detrimental for efficiency, one needs to have good measures of merit or performance, observe how rewards (and favors) are allocated and, finally, observe how people respond to the way they are treated. That is, one needs to observe performance ex post, and one needs to have a counterfactual, that is, a measure of performance of otherwise comparable people who have not been favored. Such counterfactuals are almost never available. This is why experimental work is a promising route to take. Brandts and Sola (2009) provide such experimental evidence on favoritism practices within a laboratory gift-exchange setting. They show that both senders and receivers are better off when matched with friends than with anonymous players, and hence that it is important to study possible feedback effects to identify favoritism and assess the efficiency implications of favors.

The main goal of this study is to shed light on the nature of favoritism practices at a young age, and study how they differ across age groups, 6-8 years old and 10-12 years old. We conducted a controlled experiment in a school setting, where performance is precisely measured and observed by everyone, where children can attribute a favor that provides a direct benefit to the person who is favored and where we can observe possible feedback effects and assess the implications for efficiency.

This study makes three fundamental contributions. First, we investigate favoritism practices among school children, to shed light on the *emergence* of favoritism practices. Schools are fascinating environments to study from the point of view of economists because performance,

incentives and social ties interplay on a daily basis. Schools are one of the first places where children socialize and form friendship ties and, at the same time, are confronted to competitive incentives and systematic mapping of rewards to performance. For example, children are regularly asked to choose between their peers and form teams to compete against each other – typically in gymnastic lessons. Little is known about how favoritism arises in society and how it develops with age, and understanding the mechanisms through which these practices emerge may provide valuable insights into the nature of favoritism. Schools are often considered as teaching "life lessons", meaning that the school experience is likely to shape and affect behavior later on in life. There is a recent growing interest in the economics literature in the behavior of children in economic decisions (Harbaugh et al., 2001, 2007; Bernhard et al., 2006; Benenson et al. 2007; Häger et al., 2008). Well-known games such as the dictator game, the ultimatum game and the trust game have been played with children with the objective of understanding the emergence of rationality, attitudes and norms that have been found to play a large role in decisions at adult age, such as altruism, fairness or strategic considerations. To our knowledge, we are the first to look at the issue of favoritism.

The second contribution is to document in detail the process through which favors are allocated, how they feed back into behavior and affect efficiency. Children are randomly assigned to teams of four children within their class and compete in a tournament. Teams are called up sequentially to participate to the experiment. In a first stage, the four team members are asked to perform the same task, simultaneously, which is to bring as many balls as possible from one basket to another within a fixed time limit (30 seconds). This serves to measure performance (or merit) of every child, which is made observable to all children in the group. All four children earn a little gift for that first stage, independent of their performance. At the end of this first stage, we ask the children to indicate whom among the three other team members they would like to do the task a second time, for the benefit of the team. They do this privately by handing us cards. Children are told that participation in the second stage is also rewarded with a gift. Thus, the choice provides a clear privilege to the chosen child. One of the four decisions is then implemented at random, we tell the names of children that are chosen and by whom, and the task is done a second time. After all teams have been called up, we publicly announce to the class who is the winning team. This setting enables us to study how favors are attributed conditional on performance in the first round, and study how favors affect behavior in the second round. The critical issue here will be to investigate whether changes in performance can be attributed to the favor. One of the valuable insight of this study is to point at the striking difference between measures of performance ex ante and measures of performance ex post.

The third contribution is to identify possible other motives driving favoritism, motives that

provide direct private benefits to the decision maker and are not necessarily efficient. Becker's taste-based discrimination conjectures that people benefit from interacting with some people more than others. This is an example of a selfish motive that could be detrimental for efficiency. To shed light on this possible mechanism in this context, we implemented two treatments. In one treatment, children are asked to choose one child with whom they would like to do the task *together* again for the benefit of the team. In the second treatment, children are asked to choose one child who will perform the task again *alone* for the benefit of the team. By varying whether the choosing child him or herself also plays in the second round, next to the chosen child, we can determine whether friends are chosen for the social interaction, i.e. the joy of playing together. This experimental setting enables us to draw a contrast between benefits that directly accrue to the decision maker and benefits that are efficiency-enhancing.

The data show some striking patterns. Choices are extremely biased towards friends. A child is roughly 20 to 25 percentage points more likely to be selected by another child if they are friends. Best friends are even more favored, and are between 30 and 45 percentage points more likely to be selected than children who are not friends. This is not just a tie-breaking rule: 60 percent of best friends are nominated despite not being best performer, against only 30 percent for non-best friends who are best performers in round 1. These effects are present both among younger and older children, although older children place relative more weight to their closest friends. On the other hand, we find that the weight given to past performance is very different for younger and older children. It plays no role at all for the younger ones, while it plays a large and significant role for older children. Importantly, performance becomes a distinctive selection criterium *in addition* to friendship, and not as a substitute. In fact, the friendship effect remains almost identical when conditioning on performance in the first round.

We find no evidence that favors are related to private information or unobservable characteristics correlated with the children's ability. In particular, we show that the friendship effect is very robust to the inclusion of other variables capturing ability or performance (e.g. grades in the gymnastic lesson). However, we identify a flip side to favoritism: Those who are chosen despite not being the best performers in the first round, do put more effort into the task relative to others in the second round. Thus, these favors are not necessarily detrimental to the performance of the team and could even increase overall efficiency. We also find that favors provide other benefits to the decision-maker, benefits that are not related to performance. In treatments where children had to select another child for the second round without participating him or herself in the next round, being friends becomes less important for the selection decision and completely disappears for older girls. This suggests that favoritism occurs at least partly because children like to "play with their friends".

Of course the extrapolation of these results to adult age is not straightforward. Nevertheless, while our results apply to children, the setting has a close resemblance to the labor market, where people often work in teams, and promotions can depend on social connections. This study sheds light on how favoritism possibly arises. We find that friendship ties are important already early on in life. Performance concerns seem to rise with age, but since favoritism is not detrimental to group performance, this may explain why it subsists over time and carry over to adult age. Thus, the positive flip side of favoritism may be the very reason why it survives and persists until adult age. However, it is not clear that the positive flip side is present in all settings. Bandiera et al. (2009a) find that favoritism diminishes once performance incentives are provided to managers. Our design imposes conditions that may be key for favoritism not to be detrimental: First, the nature of friendships is specific: school children interact with each other on a daily basis and are embedded in a long-term social network. Second, we chose a task where effort is adjustable and the favor could be reciprocated in a way that is beneficial for the team (as opposed to a private benefit to the person who has attributed the favor). These factors may be key to our results. For example, if production is mostly determined by the ability of its members, favoritism towards friends may result in an initially inefficient allocation of talent, and reduced productivity. On the other hand, if effort is the most important determinant of productivity, an inefficient allocation of talent may be outweighed by a higher overall effort in teams composed of friends. If these mechanisms are still present a adult age, this may have interesting implications for the discretion given to managers to pick their team.[1]

The economic significance of favoritism overall is best illustrated, but not limited to, behavior in various types of firms and organizations. A large number of people do their work in teams. Such teams share at least two features with our experimental design: first, the team has a common objective, with a potential for a free-rider problem, and second, members of the team often have an influence on who will be hired or promoted to become their team member. Our results show that the free rider problem is diminished if the team is composed of members of the same social network. Reminiscent of this fact is the success of Japanese firms, often attributed to team spirit. Perhaps this is the case because compensation is for a large part based on the firm's success, but Kandel and Lazear suggest that another possibility may be peer effects, and they note that "Partnerships are often formed among friends or family members. Despite the free-rider problems (...) partners often put in long hours and exert substantial effort. One explanation is that when partners are friends or relatives, empathy is strong ..." (Kandel and Lazear, 1992, p.

[1] In this light, the practice of, for instance, *American Airlines* not to give any discretion to management in the assignment of flight attendants to routes, may have been suboptimal. As Milgrom (1988) argues, the airline cares little about the allocation. This can be interpreted as saying that ability is not of major importance for this type of work, in which case it may be optimal to form teams of friends, rather than allocate on the basis of factors such as seniority.

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The setup of the rest of the paper is as follows. The next section briefly reviews the related literature. Section 3 describes the experimental setup and data construction. We then discuss results in section 4. Finally, section 5 concludes.

2 Related Literature

The theoretical literature on discrimination goes back to Becker (1971), who models pure taste-based discrimination as a price that individuals are willing to pay not to interact with certain groups. Goldberg (1982), showed that if some firms have a preference for nepotism, they can survive in competitive markets, and discrimination can be sustained over time. Prendergast and Topel (1996) study the implications favoritism has on optimal incentive schemes, showing that it is not always harmful.

There is a large empirical literature on discriminatory and favoritism practices among adults. The challenge of this literature has been to establish whether a preferential treatment is unfair or not, because objective measures of performance or merit are rarely available. While there is now a fair amount of evidence of discriminatory practices based on objective characteristics, such as gender, race,or ingroup members[2], the evidence on "nepotism" practices is much thinner. This literature faces a second challenge, because typically information on social ties is not available either.

Closely related to our work is the study by Brandts and Sola (2009). They provide experimental evidence on favoritism practices within a laboratory gift-exchange setting. Subjects are randomly assigned the role of managers or employees; with one manager being matched to two employees. They exogenously vary whether one of the employees is a friend of the manager or not and vary the "ex ante productivities" of the employees by varying the efficiency parameter in the gift-exchange. They find that managers tend to favor employees they personally know over others (independently of the efficiency parameter) and that these employees tend, more than other employees, to be more generous towards the manager in their distributive decisions. Overall both managers and employees are better off when matched with friends than with anonymous players. One important difference with our study is that, unlike them, we focus on a real effort game instead of an allocation game.

Other related contributions are the studies by Bandiera et al. (2009a, 2009b) who provide field experimental evidence on favoritism practices within a fruit-picking firm. Workers pick fruit

[2] Falk and Zehnder (2007), Fershtman and Gneezy (2001) are examples of recent studies providing experimental evidence of favoritism based on race. See Charness et al. (2007) and Bernhard et al. (2006) for recent findings on ingroup favoritism.

under the supervision of a manager (who allocates them to specific rows in the field) and are rewarded with a piece-rate. They argue that managers can favor workers by allocating them to better, more productive rows. They find that the performance (and therefore pay) of fruit-picking workers who are socially close to the managers is higher when the manager's pay is not linked to the worker's performance than when it is (Bandiera et al., 2009a). This suggests that managers are likely to favor their friends when it is costless to do so, but favoritism disappears when it becomes costly. They do not directly observe favors and feedback behavior though.

Our study also relates to the literature on the moral development of children. Early contributions in psychology include Piaget (1932/1965) and Kohlberg (1970). By means of interviews, they studied the attitudes of children regarding justice and identified successive stages in the moral development of the child. Building on their work, a number of experiments have been designed to study altruism and fairness among children. A first group of studies is based on simple dictator games. The typical finding is that children become more fair (egalitarian) or altruistic as they become older (for recent studies, see Fehr et al., 2008; Harbaugh et al., 2007; and Benenson et al., 2007). A second group of experiments introduces differences in merit and performance across children within a dictator game setting. The standard design (Leventhal and Anderson, 1970) is such that one child is asked to allocate rewards between herself and another child, after having performed a task and being told how well she performed in comparison to the other child. The pattern seems to be that allocation goes from non-work related for children up to 5 years old to ordinal equity – the order of rewards maps the order of performance – for 6 to 12 years old and finally to proportional equity (rewards proportional to merit) for older children and adults. Lerner (1974) designed an experiment where children take on the role of independent advisor about the allocation of rewards between two other children. He also finds that younger children put more weight on equality and older children on equity (rewards proportional to merit). Hook (1978) argues that these differences may be due to differences in cognitive ability, in particular in calculating the rewards associated with a proportionality norm.

Overall, these "allocation" studies show that fairness considerations are present among children, but all these studies are in anonymous settings. The children know nothing more about the other children than their performance in the task. This study is first to investigate the allocation of a "privilege" in a situation where the decision maker has information both about the *performance* and *identity* of the subjects involved.

3 Experimental Design

3.1 Recruitment and background characteristics

We were granted access to 9 primary schools in and near the city of Mons, Belgium. We targeted all children from classes one and two (aged between 6 and 8 years) and classes five and six (aged 11 to 12). All children whose parents gave written permission were selected to participate. Parents and teachers were informed about the basic outlines of the experiment. Children were not informed about the task prior to the experiment.

One month prior to the study, in April 2008, we obtained background characteristics about the children and their social network from three sources. First, we asked the children themselves to list their friends, beginning with their best friends. Secondly, we asked the parents for personal data about their children such as birthdays, length, number of siblings. Parents were also asked to list friends of the children, and to indicate how often they meet outside school. Finally, the teachers made a list of most popular children, and gave information about test scores.

Children with permission from their parents to participate were then grouped in groups of four. The group formation was done as follows: We took the pile of questionnaires containing the friendship information and shuffled them randomly. We then took the first three questionnaires and assigned them to a team, then we took the first questionnaire and went through the pile sequentially to pick the first questionnaire we encounterd with the name of a child mentioned by the first child assigned to the group. This ensured that we had at least one friendship tie in the group.

The experiment involved 64 complete groups of 4 (256 children). On average, we had 2.3 groups per class.

3.2 Description of the game

Groups were called one by one from their class, most often during their physical education. We told them that they were part of a tournament in their class, and that the objective was to win the tournament. We then explained the game to them. Every child had its own color of balls. They were asked to bring as many balls as possible from one basket to another within 30 seconds. We showed them what they were supposed to do. This task has several advantages: It is simple to understand, individual and team performance is easily measured, transparent to all team members, and mainly depends on effort. Also, the pilot showed that children enjoy performing the task.

For the younger children, the distance between the baskets was 2 meters, and 3 meters for the older children. We chose different distances to ensure the similarity in distributions of

performance. This is important if we want to compare behavior across age groups. They all performed the task simultaneously. They were only allowed to take one ball at the time, and any ball bouncing out of the basket was not counted (as to prevent throwing).

After 30 seconds, we shouted "stop" and counted the balls in front of them, one by one, and wrote down the number visibly for all on a scoreboard, and read the scores aloud. We then added the scores together and announced the team score for that first round. We told them that they all received a small gift (independent of their performance in the first round), and that we would play a second (and last) round.

We implemented two treatments:

- Treatment "*Together* ": We told the children that two of the four children would do the task again for the team, and earn a second little gift for that. They were asked to choose one other child who, in addition to him or herself, would be entitled to perform the task again.

- Treatment "*Alone*": We told them that only *one* of them would do the task again for the team and would earn a second little gift. They were asked to choose one child (other than her or himself) who would be entitled to perform the task again.

The choices of the children were elicited as follows. They each received three cards, with their own color and the three colors of the other players (Together-treatment) or just the colors of the other players (Alone-treatment). They selected one card in private, and handed it over to us. Figure 1 shows an example of the three cards provided to one of the children (who was assigned the color white). We gave them about a minute to make their choice and collected the cards. We then randomly picked one, showed the chosen card and read it aloud, e.g. "White chooses White and Yellow" in the Together treatment and "White Chooses Yellow" in the Alone treatment. Thus, in both treatments, children were informed of whom had chosen them. This procedure was simple to understand for the children and allowed us to infer preferences from all 4 children.

The experiment was framed as a tournament. The children were explicitly told that they formed a team and were competing against other teams in the class. They did not know how many teams there were (since we needed parental consent of the children, not all children in the class participated and we did not reveal until the end who was participating and how many teams there were). Children received one or two gifts, depending on whether they participated only in the first round or in both rounds. The gifts were introduced to make sure that doing the task a second time was indeed a privilege, and we introduced the gift for participation in the first

round as well to make sure that the children were performing the task in the first and second rounds in the exact same conditions. The gifts they received were decorated erasers and pencils for the young children, and neon markers for the older ones, wrapped in a colorful paper bag. At no point did we specify the nature of the gift to make sure that differences in valuations for these gifts would not influence their behavior and selection decision. Nevertheless, one important characteristic of these gifts is their indivisibility.

To remain as close as possible to the type of situations children are regularly confronted with, we did not attach any additional rewards to winning the tournament besides using incentives they are familiar with, that is "points" and the nomination of a "winner" at the end. Our experience with the children showed that they were indeed very motivated and cared about winning in itself (for example, some children came back with a calculator to make sure that we had added up the points of their team correctly; they were very keen to know who had won the tournament and the winning team cheered when they heard the result). Note that several recent empirical studies show that such non-monetary incentives (winning a tournament or giving feedback about relative performance) are important motivators even for adults and in the workplace (Delfgaauw et al., 2009; Blanes i Vidal and Nossol, 2009; Neckermann and Frey, 2008). The analysis will provide evidence of the extent to which children care about performance. We will come back to this point later when discussing the results.

3.3 Measure of friendship

Children and parents were asked to list friends in order of importance. Not all children returned the questionnaire, but since we needed parental authorization we always have answers from parents. Whenever data from children is missing, we used answers from their parents.[3] We constructed a measure of friendship based on the list of friends provided by each child. For each child, we identify the children listed with a dummy variable "friend". Then we coded the listed children according to the order they were listed: The first child (best friend) was coded as "friend 1", the children listed 2d to 4th were coded as "friend 2-4" and we coded all the children named after that as "friend5+".

3.4 Age and favoritism

We study two groups of children; younger children (age 6-7) and older ones (11-12). Since the experimental design is extremely simple, we consider two possible explanations why favoritism practices may change with age:

[3] For the cases where we have information from more than one source, we did not find different results.

- Friendship quality: Friendships change and grow over time, and we could expect that the friendships of older children are more stable, better established and therefore, stronger.
- Fairness considerations: As we have discussed earlier, younger children tend to be more selfish than older ones. It could be that their conception of fairness is different from older ones.

4 Results

We first present some summary statistics of the experiment (Table 1). We had 256 participants, of which 119 were girls (46%), and 137 (53%) were young children. The average number of balls brought to the other basket in round 1 is close to 10, and ranges from 5 to 13. The average performance in round 1 is very similar across all groups. Girls tend to do slightly worse (Mann-Whitney test, Z = 2.46, p =0.01), by around .3 balls. Older children also do only slightly worse, so it seems that the difference in distance between the age groups (1 meter) makes up for the difference in length and speed across ages.

Table 1 also reports the average number of times that a child is listed as a friend by a group member. The average is .96 ranging from no friends in the group to being friends of all other group members. Girls are somewhat more often listed as a friend than boys, but this difference is not significant (Mann-Whitney test, Z = -1.12, p = 0.26).

We now turn to the analysis. We first study how favors are allocated and how they relate to friendship ties and performance in the first round and investigate whether there is favoritism ex ante, that is, whether friends are more likely to be favored, conditional on measures of productivity available at the time of the selection decision. We then study how favors affect behavior and, finally, we study whether favors could be motivated by the value of social interaction.

4.1 The selection decision

The first decision of interest is the child chosen to play the second round. At the point of making the choice, the children see the performance of each of them on the board. We can therefore study whether, conditional on performance in the first round, a friend is more likely to be chosen than someone else.

4.1.1 Favors, friendships and performance in the first round

Since there are four children in the team, the benchmark probability for being chosen is 1/3. Figure 2 shows the frequency of being chosen according to performance (top panel) and friendship (bottom panel). We have pooled the data from both treatments. If we consider performance

first, we see a striking difference between younger and older children. Among young children, best performers are only slightly more likely to be selected. Performance plays a much stronger role among older children. The best performing child is selected in 50% of the cases, while the second, third and fourth have roughly equal probabilities of being chosen. The bottom panel shows the relationship between friendship and selection. Friends are selected in more than 50% of the cases, while non-friends are chosen only in 20% (younger children) and 25% of the cases (older children).This difference is significant at any conventional level for both groups. It thus appears that performance becomes an important factor in the selection choices, replacing 'noisy' factors when children get older, and not displacing any friendship effects.

We now turn to a regression analysis of these findings. We estimate the probability that child i is chosen by child j. We estimate a linear probability model:

$$P(chosen_{i,j} = 1) = \alpha + \beta Rank_i + \delta Dist_{i,j} + \theta X_i + \upsilon_i + \varepsilon_{ij},$$

where *Rank* is a set of dummy variables identifying the performance ranking in the group excluding the choosing child (1, 2, or 3); *Dist* is a set of dummy variables identifying the friendship distance between the choosing child j and child i; and X_i is a vector of attributes (such as gender). We wish to investigate whether, *conditional on performance in the first round*, friends are treated differently than others. The null hypothesis of no preferential treatment corresponds to $\delta = 0$.

Of course, friendship ties are not randomly formed, such that we cannot claim at this stage that we identify a causal effect. In particular, it could be that children who are better able are more likely to be nominated by others as their friend. These popular children will all else equal be more likely to have a low social distance with anyone in the group (even if the group is randomly formed). If popularity is correlated with ability, the estimate of δ could partly capture unobserved ability. We discuss this issue in detail after presenting first results.

We first describe the results where we group the data from both treatments by age. Table 2 reports the results for the young children. We first estimate the probability of being chosen by another child to play the second round depending on one's performance. The results confirm what we have documented earlier: For younger ones (col (1)), performance plays no role in the selection decision. The coefficients of *Rank* are small and insignificant. For older ones (col. 4)), there is a clear and strong relationship between performance in the first round and selection. Not being ranked first lowers the probability of being selected by around 30 percentage points compared to the best performer. Thus, older children are more likely to select another child based on merit. One possible explanation for this is that performance in the first round is a better predictor of performance in the second round for older children. The correlation between performance in the first and second round is indeed slightly higher for older children than for

younger ones (.50 versus .39). However, there is still a strong positive correlation between the two, even for younger children, so it does not explain the results entirely.

Col (2) and (5) control for a dummy variable for whether there is any friendship relationship between the child and the choosing child (identified by the choosing child). The coefficient of friendship is highly significant and very sizeable, for both older and younger children. Being a friend of someone increases the probability of being chosen by 16 percentage points for older children and 25 percentage points for younger ones. Col (3) and (6) includes dummies capturing the degree of friendship closeness with the choosing child. We distinguish between best friend (*Friend 1*), second best to fourth best friends (*Friend 2-4*), and fifth best friend or more (*Friend 5+*). We find that all degrees of friendship matter for young children, while mainly the best friend matters for older children. That is, the closeness of the friendship has a stronger effect on selection for older children than for younger ones. One possible explanation for this difference could be that friendships at an older age are stronger and more stable than friendships at a younger age.

In summary, the results so far show that younger children seem to base their choice mainly on friendships. Older children put more weight on performance, although best friends are more likely to be privileged too. This implies a direct benefit for friends in comparison to others. There also seems a cost associated with favoring friends. Friends that are favored do substantially worse than the best performers in their group: on average, their performance in round 1 is lower by roughly 1.4 balls (younger children) and 1.3 balls (older children). Because we had on average 2.3 groups per class, every group only competed against only a few other groups, so that a lower performance could have a substantial impact on the probability of winning the tournament.

The question is whether this friendship effect really captures a causal effect of friendship ties and whether it is really detrimental to the decision maker and the team in terms of reduced probability of winning. The first question is whether friends are more likely to be favored conditional on ex ante measures of ability and performance. The second question is whether friends who are favored respond to the favor, that is, whether performance changes between the first and second round, conditional on the favor received. If we indeed capture causal effects of friendship ties, it is tempting to estimate how much children are willing to sacrifice to privilege their friends. This would depend on how much they value their friends getting the privilege relative to others, compared to how much they care about winning the tournament times the reduced probability of winning the tournament. However, a proper analysis would also take into consideration how children respond to behavior in the second round. The next sessions address these questions.

4.1.2 Private information

Before studying the effects of the favor on subsequent performance, we need to investigate whether the favor is possibly driven by unobservables correlated with ability. For example, popular individuals are more likely to have been nominated by someone in their group and could also be of higher ability. Thus, a friendship tie could capture partially ability. This is particularly a concern because our measure of performance is just one draw. Children may know better who is most qualified to play the second round. We can investigate this possibility in three ways: First, we investigate how the friendship effect varies when we do or do not control for performance in the first round. If friendships are (positively) correlated with ability, then we would expect to see that the friendship effect differs (becomes stronger) when we do not control for performance in the first round. Second, we have information on the total number of nominations a child received in his class. Because of the random assignment of children to groups, some equally popular children will end up in groups with more or less friends. Thus, we can control for popularity and see whether the friendship effect subsists. Last, we have information on physical education grades for a sample of the older children and can examine how the friendship effect changes when we control for grade.

Table 3 presents the linear probability model estimates controlling for the rank in the first round (columns (1) and (3)) and not controlling for the rank in the first round (columns (2) and (4)). The point estimates of the friendship effect change hardly at all, compared to those of Table 2. There seems to be very little correlation between our measure of social distance and performance in the first round.

Table 4 presents linear probability estimates controlling for the child's overall popularity and grade in physical education. In columns (1) and (3), we only distinguish best performers - leaving most room for a possible bias in the friendship effect, and replicate the results of Table 2 for young and old children respectively. Columns (2) and (4) include the number of nominations[4], where missing values for nominations are replaced by the mean, and a dummy is included for missing values. We find that overall popularity has no direct effect on the probability of being chosen, and the other coefficients are not affected. Finally, we find that a higher grade in physical education (measured on a scale from 0 to 10, missing values replaced by the mean) does increase the probability of being chosen, but the effect seems completely orthogonal to the friendship effect (column (5)).

Thus, we conclude that the effects we have documented so far are not driven by a correlation between unobserved ability and friendships. The results so far suggest that indeed, there is a

[4] We included this variable only for groups where more than 50% of the children in the class participated to the experiment. For the others, we subsituted the value by the mean number of nominations, such that we can estimate the effects of the other variables on the whole sample, controlling for the effect of nominations.

form of favoritism whereby, conditional on ex ante measures of performance and ability, friends are systematically more likely to be chosen than others.

Another possible reason why friends are favored is because children have more *precise* information about their friends' ability than of other children. We can illustrate this idea in a simple model, similar to for instance Belman and Heywood (1991). To isolate the effect of private information, we abstract away from any taste-based preference for favoring friends. We start by assuming that the ability of children determines their performance, but with some error:

$$y^1 = a + \varepsilon,$$

where y^1 is the observed performance in round 1, a is the ability of the child and ε the error component. We assume that a is normally distributed with mean $\bar{a}$ and variance σ_a^2, and ε is normally distributed with mean 0 and variance σ_ε^2.

Upon observing y^1, the expected ability $\hat{a}$ equals:

$$\hat{a} = E(a \mid y^1) = \theta y^1 + (1 - \theta)\bar{a},$$

with $\theta = \sigma_a^2/(\sigma_a^2 + \sigma_\varepsilon^2)$. We will assume that the weight θ is higher for friends than for non-friends, $\theta_f > \theta_{nf}$, reflecting that information about non-friends is more noisy. From this, it follows that for any above average observed performance in round one, the conditional expectation of the ability is higher for friends than for non-friends: if $y^1 > \bar{a}$, $\hat{a}_f > \hat{a}_{nf}$. The opposite is true for performances below the average in round one. Thus, friends with above average performance in round one should be favored, but friends with below average performance in round one should be disfavored compared to non-friends.

In table 5, we estimate the friend effect where we include an interaction effect between friend and above average performance. In columns (1) and (2) we report the results for young children for friends and best friends respectively, and columns (3) and (4) for older children. There is no evidence of an important interaction effect. Most importantly, the coefficients of friends remain large and positive. We conclude that friends with below average performance are also favored, in contrast to the idea of private information.

In summary, these results provide evidence of favoritism *ex ante*, that is, conditional on performance and ability measures available *at the time of the selection decision*, friends are more likely to receive a favor than other children.

4.2 Reciprocity

The next question is whether favoritism is detrimental to the team. A possible motive for favoring friends is reciprocal considerations. Reciprocal behavior is well documented in many experiments in different contexts (e.g., see Fehr and Gaechter, 2000). Since the children are embedded in a long-term social network, reciprocity may take various forms, some that may occur outside the experiment. Friends who are chosen may return this favor later on, or may retaliate for not being chosen. Or the favor itself might be a form of reciprocation of a previous favor. All these possible reciprocal effects are important to take into account when evaluating the efficiency implications of favoritism.

We do not observe the favors that may be exchanged outside the experiment, but because we observe performance in the second round as well, we can observe whether those who are chosen, despite not being the best performers in the first round, do put more effort into the task, and thereby identify possible direct measurable reciprocity effects. More precisely, we can compare the change in performance between the first and second round and see whether it differs for those who have a friendship tie with the child choosing and those who do not. Since the analysis in the previous section showed that friends are not of better ability, we can attribute these changes to the treatment received (and in particular to whether the child has been favored or not) rather than to elements of unobserved ability that may have influenced the decision to choose the child in the first place.

Figure 3 shows how performance changes across rounds depending on the ranking of the children at the end of the first round, using the sample of children who play both rounds. Obviously, the best performing children have a higher performance in the first round. But in the second round the gap between best performers and the other children shrinks substantially. Performance remains very similar in the second round for the first ranked children, but improves significantly for the lower ranked children. Thus, the picture is a very different one depending on whether one looks at performance ex ante or ex post.

How can we explain this improvement in performance ex post for low achievers? The analysis of the previous section showed that the choice of a friend was unlikely to be driven by private information about ability, since it appeared uncorrelated with any other measure of ability or performance. A second possible explanation is regression to the mean: low achievers have more room to improve than high achievers, through learning or otherwise. A third explanation is a positive flip side of favoritism, i.e. those who have been favored could reciprocate the favor by providing more effort. We now investigate in more detail the relationship between friendship ties and the change in performance.

If the improvement in performance is entirely due to regression to the mean, then the im-

provement in performance should be independent of whether there is a friendship tie between the choosing and chosen child. Note that the same is true if the choice was driven by private information about ability. If children were indeed choosing the child they believe is the most able (and is not necessarily the best performer in the first round), then the analysis in the previous section shows that there is no reason to expect that this child should be a friend, and so there is no reason why we should expect the improvement in performance to be different for friends than others (conditioning on performance in the first round).

Let y_j^* denote the expected output of child j. We wish to test whether $y_j^2(friend_{i,j} = 1|y_j^1) > y_j^2(friend_{i,j} = 0|y_j^1)$, that is, whether friends put in more effort in the second round in comparison to non friends, conditional on their performance in the first round. Table 6 shows the results, where the dependent variable is the increase in performance over the two rounds, i.e., $y_j^2 - y_j^1$.

We find a striking pattern: Conditional on performance in round 1, both younger and older children are significantly more likely to improve their performance if they have been chosen by their friend, more precisely, by their closest friend. Clearly, there is also an effect of regression to the mean, those who performed better in the first round have lower improvements in performance across rounds. But there is also strong evidence of a positive flip side of favoritism, something that one can only uncover if one can observe performance ex post. This effect is particularly noteworthy given that we have given no additional incentives to winning the tournament than the mere "honour of winning".

The next two columns in table 6 show the increase in performance over the two rounds if we split the data by leaders (children randomly selected by us to play the second round) and chosen players (children nominated by the leaders). We see that the increase in performance if the other child is a best friend is only significant for the chosen players, and the effect is substantial: if a child is chosen by their best friends, their average performance increases by 2 balls. Interestingly, this effect only seems to happen for children that were not best performers. The coefficient of the interaction between best friends and highest rank in round 1 is negative and of the same size as the coefficient of best friends. Thus, only the children that are favored, i.e., chosen despite not being the best performers, reciprocate by increasing their efforts. This is a form of positive reciprocity, and fits with the idea that people like to help people who helped them, such as formalized by Rabin (1993) and Dufwenberg and Kirchsteiger (2004).

Favored children reciprocate so much that this offsets the fact that they were not best performers. For instance, for both the younger and older children, the mean difference between best and worst performers in round 1 is around 2.3 balls. After controlling for the regression to the mean, this translates into an expected 1 extra ball in round 2 by choosing the best performer over the worst performer. This is less than the 2 extra balls of a child that is favored by his

or her best friend. This insight shows that favoritism may not be that costly after all, from the point of view of the discriminator. Also, if this mechanism is as important as our results suggest, increasing the incentives to win the competition will not necessarily change the selection decision, and may in fact increase the importance of friendship ties.[5]

4.3 The role of social interaction

Last, we investigate the extent to which favoring friends is related to the value of playing together. Social interaction would provide a direct benefit to the decision maker as well, but in contrast to the reciprocity effect, would not benefit the other members of the team.

Our treatments enable us to shed some light on these possible additional motives. In one treatment, children are asked with whom they would like to do the task again and in the other, they are asked to pick one person who will do the task again alone for the benefit of the team. Of course this social interaction is very limited, since children perform the task independently. Nevertheless, comparing their behavior in these two treatments may shed some light on whether children value social interaction at all.

We estimate the following model:

$$P(chosen_{i,j} = 1) = \alpha + \beta Rank_i + \delta Dist_{ij} + \gamma Dist_{ij} \times treatment + \theta X_i + \upsilon_i + \varepsilon_{ij},$$

where we interact the friendship dummy variables with the treatment dummy (0 for Together treatment, 1 for Alone treatment). The importance of social interaction is measured by $\delta - \gamma$.

Table 7 reports the results. Because the coefficients on distance were similar for 2-4 friends and 5 or more friends, we group them together. Column (1) shows the estimates for younger children. As before, performance seems of little relevance to the young children, while friends are much more likely to be chosen, with the highest coefficient for best friends. The interaction terms of friends and treatment Alone are small and not significant.

Column (2) reports estimates for older children. We find a large negative coefficient for the interaction term best friend and treatment Alone. Thus, best friends are much more likely to be chosen in the Together treatment, but the effect is weaker in the Alone treatment.[6]

[5] Columns (3) and (4) pool the younger and older children for the sake of number of observations. Splitting the results by age, we find that the effect of best friends is somewhat lower for the older children. Children that were ranked second in round 1 and were favored by their best friend still offset their lower performance.

[6] This interaction effect is strongest for girls. They are much more likely to select their best friend in the Together treatment, but not in the Alone treatment: the coefficient of best friend (.64) is offset by the negative interaction term (-.64), both coefficients significantly different from 0 at the 1% level.

5 Conclusions

This paper provides unique field evidence on the practice of favoritism among children. It is one of the few studies with information on individual performance and the social network. In a controlled field experiment, we are able to identify the importance and development of favoritism among children, and provide a broad picture of how favors are attributed and how they feed back into behavior.

We find that both younger and older children tend to favor their friends over others. Performance, by contrast, plays no role at all among younger children, but is very important among older children. Our second result relates to the nature of favoritism and the motives behind favors. It appears that favoritism is directly beneficial both to the team and the decision maker. Although friends who are favored do not appear to be of better ability, those who are chosen *despite* not being the best performers, put in more effort in the second round than all others. Favors appear to be reciprocated in such a way that favoritism overall is not detrimental to the team. We can identify some key assumptions for our results to have relevance. First, productivity has to depend for a relatively important part on effort (rather than ability). Only if higher efforts can compensate for lower ability, can it be beneficial to select friends rather than the person with the highest ability. Secondly, there have to be externalities present in the production technology. Reciprocation by increased effort is only beneficial if it helps the other team members. Finally, note that in the setting we studied, reciprocity takes the form of increased efforts in the productive task. More generally, there may be scope to reciprocate favors in other ways, possibly leading to nonproductive uses of resources. We also find that decisions are motivated partly by other benefits accruing to the decision-maker only (value of playing together), for older female children. Thus, our results do show that favors are not as detrimental as one would conclude based on measures of performance *ex ante* (before the favor has been attributed), but they also suggest that the mechanisms through which favors can be reciprocated and provide benefits to the decision-maker play a key role as well.

Finally, while our results apply to children, the setting has a close resemblance to the labor market, where people often work in teams, and promotions can depend on social connections. From that perspective, the emergence of social ties may play a critical role in determining chances later on in life. Importantly, friendships do not appear to distort inefficiently the allocation of resources, but they do benefit particularly those who are well embedded in social networks. Thus, it seems important to understand why and when do differences in network positions emerge. Conti et al. (2009) find that the early family and school environment play a crucial role in shaping friendship networks. This type of research should uncover valuable policy-relevant routes to explore in the light of the large disparities existing in society.

6 Appendix: Instructions and Questionnaires

6.0.1 Instructions

[Translated from French. Instructions were given verbally] Welcome to you all. We organized a small tournament in your class. You are the [number] team. The objective is to win the tournament. Every one of you will get its own color. The objective is to bring as many balls from one basket to another within 30 seconds. There are two rules. First, you can only take one ball at the time. Secondly, you are not allowed to throw balls. If you throw a ball, it is likely that it will bounce out of the baskets, and it will not count. Now please stand behind your color of balls. Are you ready? [task done, scores written down and read aloud] Well done. For this, you will all receive a small gift at the end. Now we will play a second round, where you can earn an additional gift, but this time only to a few and play. This is the last round we play. I will give you cards with the colors of the other players. Please select the card with the color of the other player you would like to play with in private, and hand it over to me. After I collected all cards, I will shuffle them and pick one. [Cards shuffled in front of them and one randomly selected]. Okay, so [names and colors of 2 players] will play a second-round. The other two players will watch. [task done, end score reported]. That was it. You will receive your gifts later today. Thank you for participating!

Questionnaire for children Name

Class

Name of teacher

Who are your closest friends in the class? (by order of preference)

Who are your favorite play-mates in the class?

Which of your schoolmates do you see regularly outside the school?

Questionnaire for parents Name

Date of birth

Address

Year of study

Height

Weight

How far do you live from the school? (in km)

When did you join this school?

Profession of father

Profession of mother

Number of brothers

Number of sisters

Does he/she wear glasses?

Does he/she wear braces?

Position in the sibship: (1) for eldest, (2) for second etc.

Who are his closest friends? (by order of preference)

Which schoolmates does he/she regularly outside the school?

How often does he/she interact with other children (other than siblings) outside the school? 1) daily; 2) at least once a week, 3) at least once a month, 4) rarely, 5) never

Questionnaire for teacher Who are the most popular children in the class?

Who are the least popular children in the class?

Who are the children who received disciplinary measures in the last three months?

Average grades in physical education of all children

Average grades in mathematics of all children

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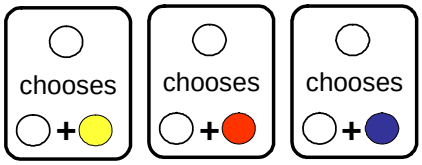

Figure 1: Example of choice cards for player 'white' (treatment SO).

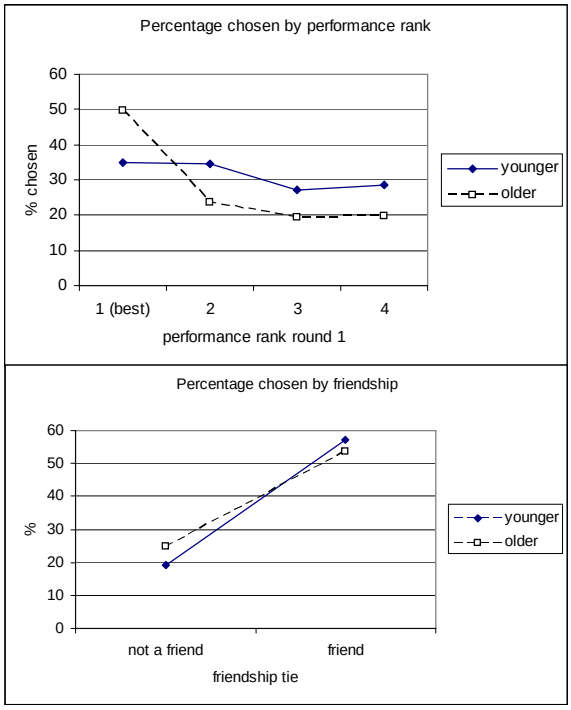

Figure 2: Percentage chosen by performance and friendship ties.

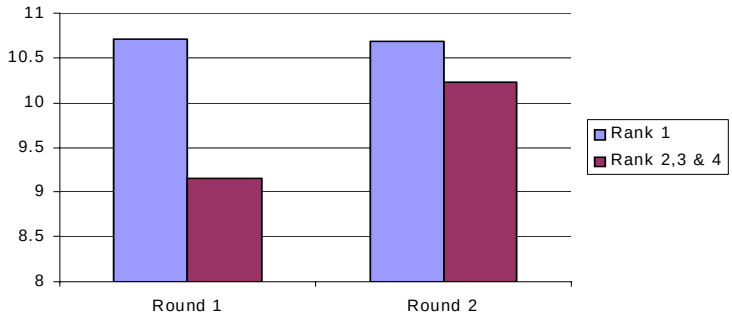

Figure 1: Performance in Round 1 and 2, split by best performers (rank 1), and not best performers (ranks 2, 3 and 4).

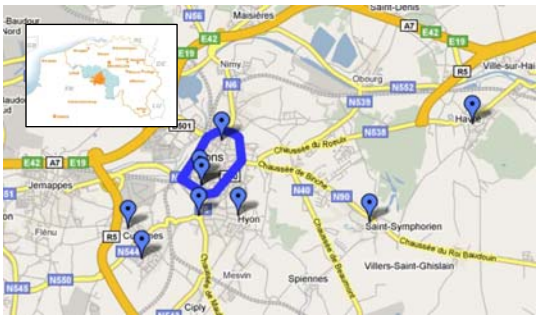

Figure 4: Map of Mons and surroundings with the school location Inset: Belgium with the region of Mons highlighted.

Table 1 - Summary Statistics

category	average	st.dev.	min.	max.	N. obs.
Performance round 1					
All	9.94	1.37	5	13	256
Boys	10.11	1.51	5	13	137
Girls	9.76	1.16	7	12	119
Young	10.07	1.42	5	13	136
Old	9.81	1.29	6	13	120
Number of friends in the group					
All	.96	.88	0	3	256
Boys	.91	.87	0	3	137
Girls	1.03	.89	0	3	119
Young	.96	.83	0	3	136
Old	.97	.93	0	3	120

Table 2 - Probability of being chosen for the second round

	(1)	(2)	(3)	(4)	(5)	(6)
	—- younger children —-			—— older children ——		
Rank 2	-.052	-.038	-.045	-.313***	-.313***	-.290***
	(.055)	(.053)	(.053)	(.059)	(.060)	(.058)
Rank 3	-.076	-.084	-.097*	-.266***	-.279***	-.275***
	(.058)	(.056)	(.056)	(.064)	(.066)	(.062)
Friend		.251***			.163***	
		(.049)			(.051)	
Friend 1 (best friend)			.330***			.438***
			(.094)			(.091)
Friend 2-4			.226***			.083
			(.075)			(.065)
Friend 5+			.207***			.019
			(.074)			(.072)
Female	-.015	-.016	-.022	-.078	-.081	-.077
	(.046)	(.044)	(.045)	(.050)	(.050)	(.048)
constant	.360***	.271***	.285***	.521***	.478***	.467***
	(.038)	(.036)	(.041)	(.049)	(.055)	(.053)
N children	136	136	136	120	120	120
R^2	.005	.07	.07	.11	.16	.17

Notes: Linear probability model. Standard errors clustered by child. Performance rank excludes choosing player. Data pooled over treatments. *** significant at 1%, ** at 5%, and * at 10%.

Table 3 - Probability of being chosen for the second round

	(1)	(2)	(3)	(4)
	— younger children —		— older children —	
Friend 1 (best friend)	.330***	.313***	.438***	.457***
	(.094)	(.091)	(.091)	(.091)
Friend 2-4	.226***	.228***	.083	.123
	(.075)	(.074)	(.065)	(.072)
Friend 5+	.207***	.210***	.019	.079
	(.074)	(.074)	(.072)	(.071)
N children	136	136	120	120
controlling for performance	Yes	No	Yes	No
controlling for performance	Yes	Yes	Yes	Yes
R^2	.07	.06	.17	.08

Notes: Linear probability model. Standard errors clustered by child. Performance rank excludes choosing player. Data pooled over treatments. *** significant at 1% , ** at 5%, and * at 10%.

Table 4 - Probability of being chosen for the second round (continued)

	(1)	(2)	(3)	(4)	(5)
	- younger children -		——- older children ——-		
Best performer	.066	.067	.316***	.300***	.285***
	(.045)	(.045)	(.053)	(.052)	(.053)
Friend 1 (best friend)	.325***	.326***	.439***	.437***	.454***
	(.093)	(.092)	(.092)	(.092)	(.089)
Friend 2+ (not best friend)	.219***	.220***	.083	.073	.094
	(.056)	(.058)	(.058)	(.059)	(.057)
Number of nominations		-.001		.014	
		(.012)		(.016)	
Missing nomination dummy†		-.008		-.016	
		(.045)		(.058)	
Grade in physical education					.136***
					(.052)
Missing grade dummy††					.007
					(.052)
Female	-.017	-0.17	.006	-.099*	-.079
	(.044)	(.044)	(.052)	(.050)	(.048)
constant	.217***	.219***	.126***	.114	-.947**
	(.038)	(.061)	(.040)	(.087)	(.407)
N children	136	136	116	116	116
R^2	.07	.07	.18	.19	.20

Notes: Linear probability model. Standard errors clustered by child. Data pooled over treatments. *** denotes significant at 1%, ** at 5%, and * at 10%.

†Missing values nominations replaced with mean value.

††Missing grades physical education replaced with mean grade

Table 5 - Probability of being chosen for the second round (cont.)

	(1)	(2)	(3)	(4)
	- younger children -		- older children -	
Rank 2	-.046	-.064	-.306***	-.300***
	(.055)	(.054)	(.061)	(.057)
Rank 3	-.097*	-.095	-.257***	-.283***
	(.059)	(.058)	(.067)	(.061)
Friend	.276***		.100	
	(.065)		(.091)	
Friend x above average	-.054		.091	
	(.091)		(.102)	
Best friend		.233*		.421**
		(.119)		(.191)
Best friend x above average		.123		-.004
		(.185)		(.216)
Female	–.019	-.019	-.081	-.079
	(.044)	(.046)	(.050)	(.048)
constant	.284***	.345***	.470***	.493***
	(.041)	(.039)	(.056)	(.049)
N children	136	136	120	120
R^2	.07	.03	.16	.16

Notes: Linear probability model. Standard errors clustered by child. Data pooled over treatments. *** significant at 1%, ** at 5%, and * at 10%.

Table 6 - Performance increase over rounds and friendship

Dep. variable: performance round 2 - performance round 1				
	(1)	(2)	(3)	(4)
	Younger	Older	Leader	Chosen
Best friend	1.26**	.68	.37	2.07***
	(.52)	(.43)	(.95)	(.45)
Performance round 1	-.60***	-.52***	-.49*	-.55***
	(.16)	(.10)	(.24)	(.13)
Rank 1 (Best performance round 1)			-.11	.43
			(.75)	(.34)
Best Friend x Rank 1			-.35	-2.03**
			(1.47)	(.81)
Female	.26	-.66*	-.47	.01
	(.41)	(.36)	(.64)	(.27)
Constant	6.52***	5.68***	5.52**	5.56***
	(1.69)	(1.09)	(2.42)	(1.33)
N children	40	28	26	55
R-squared Adj.	.30	.53	.04	.45

Notes: OLS estimates. *** significant at 1%, ** at 5%, and * at 10%

Table 7 - Probability of being chosen for the second round

	(1) young	(2) older
Rank 2	-.046	-.307***
	(.054)	(.060)
Rank 3	-.094	-.302***
	(.057)	(.063)
Friend 1 (best friend)	.345***	.583***
	(.109)	(.126)
Friend 2+ (not best friend)	.219***	.091
	(.065)	(.089)
Friend 1 & treatment 2 (Alone)	-.051	-.278*
	(.197)	(.166)
Friend 2+ & treatment 2 (Alone)	-.008	-.016
	(.116)	(.100)
Female	-.019	-.085*
	(.044)	(.050)
constant	.284***	.484***
	(.041)	(.055)
N children	136	120
R^2	.19	.12

Notes: standard errors clustered by child. Performance rank excludes choosing player. *** 1% level significance, ** 5%, * 10%.