# Social Cheating in the Classroom: A Field Experiment

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## Abstract

We study children's cheating by conducting a field experiment in a local primary school. Children graded either their own or another student's test, and they could cheat by misreporting the overall score. Unbeknownst to them, the test-taker's original answers were recorded by carbonless copy paper. As expected, we find that children were generally more likely to cheat for themselves compared to cheating for others. To investigate cheating for others, we vary whether children graded their friend or an acquaintance and whether the grading pairs could discuss the test while grading. For the friend, children cheated little with or without discussion. For the acquaintance, they also rarely cheated without discussion; but with discussion, they cheated frequently, nearly as much as when grading themselves. We discuss implications of these findings on social cheating for theories about reciprocity and reputation.

Keywords: field experiment, dishonesty, individual cheating, social cheating, children, carbonless method

I conclude, then, that the plea of having acted in the interests of a friend is not a valid excuse for a wrong action.

–Marcus Tullius Cicero, *Laelius On Friendship, 44 BC*

**Introduction**

Dishonesty creates innumerable problems in business, politics, academics, athletics, and other spheres of everyday life. People often cheat to benefit themselves, such as misreporting income on tax returns, cheating on exams, or taking bribes. But people also engage in *social cheating* in which they cheat to benefit other people, such as covering up misconduct by coworkers, showing favoritism toward a relative, or lying for a friend. The temptation for social cheating involves a clash between a person's motive to help someone, which is typically considered good, and the obligation to adhere to ethical standards, which now stand in the way of helping. Hence, social cheating can pose a difficult dilemma between helping a friend and meeting ethical obligations.

In an essay on friendship, Cicero, the great Roman orator, argued that friendship cannot justify wrongdoing. However, previous research suggests that people do not always follow Cicero's prescription. Previous studies find people bear less guilt in cheating when others are also beneficiaries than when cheating only benefits oneself. Shalvi, Gino, Barkan, & Ayal (2015) review this literature and argue that people often use the cover of altruism toward others as a self-serving justification for violations, enabling them to "do wrong while feeling moral." For example, one study found that participants cheated more often, by misreporting their performance in a word-unscrambling task, when the lie benefited both the participant and a partner compared to when it only benefited themselves (Wiltermuth, 2011). In addition, this research found that participants were even more likely to cheat when they had a stronger altruistic justification. For example, participants cheated more often, by misreporting their performance in a matrix-solving task, when it benefited more other people in addition to themselves (Gino, Ayal, & Ariely, 2013). They also cheated more often when the beneficiary had less initial endowment, thus poorer, than themselves (Gino & Pierce, 2009). Overall, this research suggests that people are more prone to social cheating than individual cheating because social cheating provides an altruistic justification for wrongdoing.

These previous studies examined situations in which a participant's cheating benefited themselves in addition to other people. Here we examine social cheating when it is separate from individual cheating: when people can cheat to benefit others without any direct benefits to themselves. A previous experiment examined this kind of pure social cheating in a situation in which participants could cheat to benefit an ingroup member (Cadsby, Du, & Song, 2016). Participants privately rolled a die that was supposed to determine how to divide money between two individuals: an ingroup member from their own university and an outgroup member from a different university. But, they could potentially cheat by misreporting the number on the die. The study found that some participants cheated to benefit an ingroup member, although not as often as they cheated to benefit themselves. Here we study people's social cheating for friends and acquaintances. We examine how it differs from individual cheating, and in particular, how relationships and communication influence social cheating.

We conducted a randomized field experiment in the classrooms of a primary school. Classroom cheating jeopardizes the integrity of academic evaluations. Moreover, cheating in school contradicts an important goal of education which is to help students develop high moral standards. Most previous experiments on ethical behavior have been conducted in the lab due to its advantages for experimental control (reviewed in Rosenbaum, Billinger, &

Stieglitz, 2014). In contrast, there is less evidence available from field experiments.[1] In natural settings, it is difficult to observe dishonesty because people hide their misdeeds. Here we use the classroom as the setting for a field experiment, which offers several methodological advantages. First, students actually do grade each other's work in regular class (usually for less important exams) so the task is familiar and natural. Second, we can readily measure participants' relationships to each other to distinguish friends from acquaintances in the classroom social network.

We invited students to participate in an extracurricular activity involving a knowledge quiz which resembles typical classroom tests. To compare individual and social cheating, we manipulated whether the test-taker graded their own test or another student's test (both grading self and grading others are commonly practiced in this school and many others). The grader could potentially cheat by misreporting the overall score. However, unbeknownst to students, the test-taker's original answers were secretly recorded by carbonless copy paper, allowing us to observe participants' cheating. Students had an incentive to cheat because they received credits for correct answers, which they could exchange for rewards (markers, pencils, etc.). For social cheating, we varied two additional factors: 1) whether participants graded a friend or an acquaintance; and 2) whether or not a mutually grading pair could discuss with each other while grading.

**Hypotheses about social cheating**

We test two pairs of opposing hypotheses about social cheating when it does not immediately benefit the cheater. In the first pair, we test the hypothesis that participants will be more likely to cheat for a friend than an acquaintance. The reason is that people care more about their friends and so this altruism could potentially motivate them to cheat on the friend's behalf. This would reflect a kind of cost/benefit analysis (e.g., Erat & Gneezy, 2012) where giving rewards to a friend is more likely to outweigh the potential costs of cheating (damage to reputation, feelings of guilt, etc.). Oppositely, we test the alternative hypothesis that participants might refrain from social cheating for a friend. The reason is that closer relationships could heighten the reputation stakes and if someone looks bad in the eyes of a close friend, they might damage this valuable relationship. As Cicero put it plainly, "we should ask from friends, and do for friends, only what is good." Therefore, with higher reputation at stake, people could be less willing to cheat for a friend than an acquaintance.

In the second pair, we test the hypothesis that participants will be more likely to engage in social cheating when they can discuss during grading. Discussion could promote unethical cooperation toward cheating for mutual gains, that is, reciprocal cheating. Allowing discussion during grading creates repeated interactions in which the students have the opportunity to trade favors, whereas grading in silence is more of a one-shot game where reciprocity is unlikely (e.g., Axelrod, 1984). Hence, reciprocity theory predicts greater social cheating with discussion. Related, previous studies found that group discussion can lead people to justify their own dishonesty—this can happen even when there is no payoff linkage between group members (Kocher, Schudy, & Spantig, 2017). Oppositely, we test the alternative hypothesis that participants will feel more guilty and shameful (Tangney & Dearing, 2002) about cheating when they discuss it with others, which could inhibit the temptation to behave unethically. Therefore, people could be less likely to cheat for each other if discussion heightens the moral cost of cheating. Moreover, the moral and reputational costs of cheating might be even higher between friends than between acquaintances. If so, we

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[1] Pierce & Balasubramanian (2015) provide a short survey on behavioral field evidence on dishonesty. It is worth noting that the landmark and probably earliest study of honesty was conducted in field settings in the 1920s by Hartshorne & May (1928) using 10- to 13-year-old children as subjects. They concluded that honesty was not a fundamental trait and was considerably influenced by the situation.

could see an interaction such that discussion facilitates social cheating to a greater extent between acquaintances than between friends.

**Method**

Our participants are sixth graders from a local primary school in the city of Ningbo, China ($N = 199$, 51% male; $M_{age} = 11.6$; $SD_{age} = 0.8$). We conducted five sessions in different classrooms with around 40 students each. We announced to the 6th grade classes that there would be an extracurricular activity during the lunch break in which they could receive rewards of various stationaries. Students were asked to form a pair with one of their best friends to join the activity. (Most students, ~90%, joined the activity.) We randomly assigned the students to one of the five conditions, which each took place in a separate classroom. All five sessions were conducted the same day: three sessions were conducted at the same time, and the other two sessions immediately followed. This ensured that participants did not learn about the study from peers beforehand. Participants received credits according to their performance in the activity, and they knew these credits could later be used to purchase goods such as pencil boxes, notebooks, bookmarks, and stickers.[2] These goods were deemed desirable as 96% of students said they wanted the rewards from a post-experimental survey. No conditions or measures were dropped from this experiment, and no observations were excluded from the data analysis.

To observe cheating, we use carbonless copy paper to record students' original responses before they had a chance to cheat (see also Ruedy & Schweitzer, 2010). Specifically, students answered a general knowledge quiz that was similar to quizzes that students regularly experience in the classroom. By using carbonless copy paper, we can assess individual students' cheating while minimizing their fear of being detected. This also provides greater resolution on individual cheating than studies that measure cheating only at the group level (e.g., Fischbacher & Föllmi-Heusi, 2013; Mazar, Amir, & Ariely, 2008).

The sessions were conducted in classrooms. Upon arrival, pairs of students—who were invited as pairs of friends—were assigned to seats in the classroom with tickets that provided their seat and ID number. Participants received the quiz in a closed folder. Participants were told that they would have five minutes to answer up to 50 multiple-choice quiz questions, and they would earn one credit for each correct answer. They were then asked to open the folder and begin working. We wrote the quiz questions so that students would be unlikely to know most answers and so would need to make guesses. For example, one question asked, "when was Einstein awarded the Nobel Prize? (1920, 1921, 1922, 1923)." This ensured that students would have incorrect answers that they would be tempted to cheat to correct. Also, students might find it easier to justify and more tempting to cheat on questions that involve more guessing.

After the quiz, the experimenter asked participants to detach their quiz sheet from the folder and then answer a filler question on the back. This filler question asked participants how they felt while taking the quiz. Meanwhile, the experimenter collected the folders, which, unbeknownst to participants, contained an imprint of their original answers on the carbonless copy paper.

Next, the experimenter assigned students' quiz sheets and the answer key to the student grader, who differed depending on the experimental condition (self, friend, or acquaintance). The grader was asked to copy the quiz answers to a record sheet and then grade them according to the answer key. On the record sheet, they also recorded the test-taker's ID, their own ID, and the total number of correct answers. After all graders finished,

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[2] Participants could earn up to 55 credits. They could use their credits to exchange at the rate of 1 credit, 10 credits, 20 credits, and 40 credits for different rewards with corresponding market values.

the experimenter collected the record sheets. We could then compare the record sheet with the carbonless copy paper to assess how many times a grader cheated.

Across between-subject conditions, we manipulated who graded for whom. We had five conditions: a self condition where students graded their own quiz and four conditions in which students graded a friend or acquaintance either in silence or with discussion of the quiz. In the discussion condition, pairs of students (friends or acquaintances) were seated alongside each other and graded each other's quiz, while they were encouraged to discuss the quiz during the grading stage (but not when they were completing the quiz). In the silence condition, pairs of students (friends or acquaintances) were seated separately while grading each other's quiz without discussion. (See appendix for more detail on procedures.)

After the quiz, participants completed another task to assess cheating, which was a variation of the mind game (Jiang, 2013; Kajackaite & Gneezy, 2017). Specifically, each student was asked to think of a number between 1 and 6 and keep it in mind (without telling anyone). Then their partner (the same partner as for the quiz) rolled a die, and the student reported whether it matched the number in their mind. If the number matched, then the partner earned 5 additional credits and 0 credits otherwise. (In the self condition, they rolled the die for themselves.) After the mind game, students answered a post-experiment survey including demographic questions. Though this task only allows us to detect cheating probabilistically at the aggregate level, it further reduces the fear of being caught cheating, and it also removes merit as a factor for success which could otherwise make meritocratic students less likely to cheat.

*Predictions*

The current hypotheses about social cheating make the following predictions. First, if participants care more about giving reward to their friend, then they will cheat more on the quiz and on the mind game for the friend than for the acquaintance. If, however, participants care more about their reputation with friends, then they will cheat more for the acquaintance than for the friend. Second, if discussion facilitates reciprocal cheating, then participants will cheat more for each other with discussion than in silence. If, however, discussion increases the shame and guilt of cheating, then participants will cheat less for each other with discussion than in silence.

**Results**

*Cheating on the quiz*

We find that participants who graded their own quiz cheated by reporting more correct answers than were actually recorded on the carbonless copy paper, $M = 3.97$ misreported answers, $t(38) = 5.23$, $p < .001$ (Fig. 1). In the acquaintance condition, participants did not significantly cheat for the acquaintance when grading in silence, $M = -0.34$, $t(43) = 1.20$, $p = .24$, but they did cheat at substantial levels when there was discussion, $M = 2.83$, $t(35) = 2.78$, $p = .009$. In the friend condition, participants showed small but significant cheating for their friend when grading in silence, $M = 0.85$, $t(39) = 2.34$, $p = .02$, but surprisingly, they did not cheat for their friend when grading with discussion, $M = 0.40$, $t(39) = 0.99$, $p = .33$.
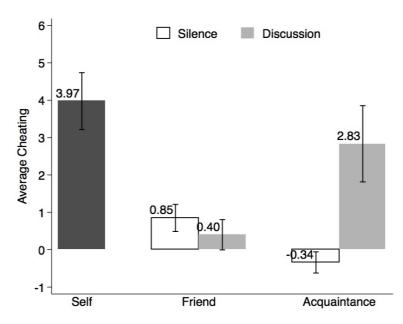
**Fig. 1.** Average cheating levels across conditions. *Note*: Error bars are standard errors.

Next, we compare cheating across conditions. Participants cheated significantly more for themselves than for the friend (with and without discussion), and for the acquaintance in silence (all $ps < .001$), but not significantly more for the acquaintance with discussion, $t(73) = 0.91$, $p = .37$. Across the social cheating conditions, we conduct a factorial ANOVA with friendship and discussion as independent variables. We find a significant interaction between friendship and discussion, $F(1, 156) = 10.60$, $p = 0.001$. Namely, in the silence condition, participants cheated more for the friend than for the acquaintance, $t(82) = 2.61$, $p = .01$. In the discussion condition, however, we find the reverse pattern: participants cheated more for the acquaintance than the friend, $t(74) = 2.30$, $p = .02$. Moreover, in the acquaintance condition, participants cheated more often with discussion than in silence, $t(78) = 3.26$, $p = .002$; in the friend condition, the frequency of cheating did not differ between discussion and silence, $t(78) = 0.83$, $p = .21$. These results show a surprising interaction between friendship and discussion, suggesting that the high reputation stakes in friendship might have suppressed the tendency to use discussion to facilitate reciprocal cheating

We next examine more closely why participants were especially prone to cheat for an acquaintance with discussion. As alluded to in the discussion of the hypotheses, is this the result of mutual cheating by reciprocity within a pair? To see, we test whether cheating is correlated within pairs of students. These correlations in each condition are: friend-discussion: $r = -.20$, $p = .41$; friend-silence: $r = .13$, $p = .57$; acquaintance-discussion: $r = .48$, $p = 0.04$; acquaintance-silence: $r = .05$, $p = .81$. Thus, the correlation is only significant in the acquaintance with discussion condition, lending support to the hypothesis that discussion facilitated reciprocal cheating among acquaintances, whereas this did not occur among friends.

We also compare distributions of cheating across conditions. We categorized the cheating level into four blocks: underreporting the number correct ($< 0$), accurate ($0$), low cheating ($1$-$3$), and high cheating ($> 3$). Fig. 2 displays the distributions for all conditions. The distribution of individual cheating is significantly different from the distribution of cheating for the friend (with and without discussion), and for the acquaintance in silence (all $ps < .002$), but not significantly different from the distribution of cheating for the acquaintance with discussion, $\chi^2(3) = 4.83$, $p = .19$. In particular, the frequency of cheating on more than three answers is significantly higher for individual cheating than social cheating

(all $ps < .07$). In the acquaintance condition, participants cheated more often with discussion than in silence, $\chi^2(3) = 9.41$, $p = .02$; and the frequency of cheating on more than three answers is also significantly higher with discussion than in silence, $\chi^2(1) = 6.99$, $p = .008$. In the friend condition, the distributions do not differ depending on discussion, $\chi^2(3) = 2.37$, $p = .50$. Thus, the pattern of distributions was consistent with average cheating.
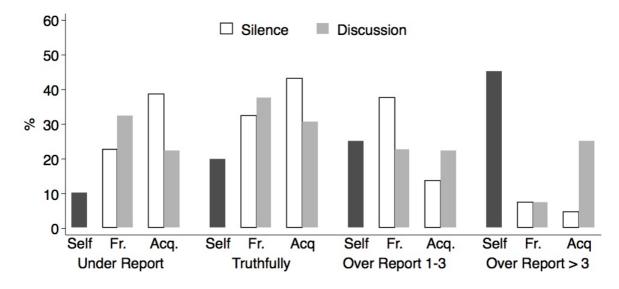


**Fig. 2.** Distributions of cheating across conditions

*Cheating in the mind game*

      The mind game reduces the fear of being detected and therefore we generally expect high levels of cheating in all conditions. In this analysis, the dependent variable is the proportion of participants who reported a successful guess; that is, the number they guessed silently in their mind was the same as the rolled number on the die. Across all conditions, at least 52% of participants reported thinking of the same number that was rolled, which is significantly higher than the probability of 17% without cheating ($ps < .001$ for all comparisons, Fig. 3). Comparing conditions, participants cheated more often for themselves than for friends in silence, $z = 2.05$, $p = .04$, friends with discussion, $z = 2.27$, $p = .02$, and acquaintances in silence, $z = 1.73$, $p = .08$, whereas cheating did not differ between the self condition and the acquaintance-discussion condition, $z = 0.99$, $p = .32$. We do not find any statistical differences in cheating among the four conditions where participants graded for others.

      We also test whether cheating is correlated within a pair. The correlation is marginally significant for the friend in silence ($r = .41$, $p = .07$) and not significant for the friend with discussion ($r = .12$, $p = .61$). In contrast, the correlation is significant for the acquaintance with discussion ($r = .52$, $p = .03$) but not significant for the acquaintance in silence ($r = .29$, $p = .19$).

      In sum, we found more cheating overall in the mind game, which we expected since there is little risk of being caught. Participants cheated in all conditions whether to benefit themselves, a friend, or an acquaintance. In this case, we did not see statistical differences among the different kinds of social cheating. However, we note that these tests were less sensitive than for the quiz because we could only identity cheating probabilistically at the aggregate level, whereas the quiz allowed us to observe cheating at the individual level.
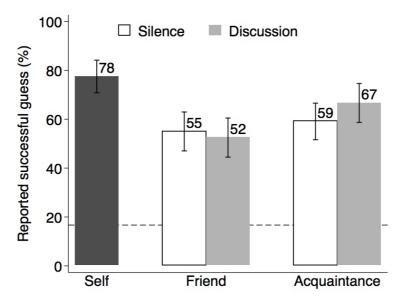
**Fig. 3.** Proportion of participants who reported that the number they guessed in their mind was the same as the rolled number. *Note*: The dashed line represents chance levels of success without cheating.

**Discussion**

In a randomized field experiment, we found that participants cheated for an acquaintance by misreporting their quiz score more often when they could discuss during grading than without discussion. In fact, they cheated just as much for an acquaintance with discussion as they cheated when grading their own quiz, but they barely cheated for an acquaintance without discussion. Surprisingly, participants cheated little on the quiz for a friend, with or without discussion, suggesting that friendship might have suppressed the tendency to use discussion to collude toward reciprocal cheating. In the mind game, where the fear of being caught was reduced, we observed high frequency of cheating in all conditions. In general, except for the acquaintance-discussion where the cheating level is similar to the self condition, participants cheated slightly more for themselves than for others in the mind game.

The quiz results for friends partly align with Cicero's argument that a strong friendship is rooted in virtue and so a person should not commit misdeeds to benefit a friend. Compared to the acquaintance, participants were less likely to cheat for a friend when discussing the quiz. This observation supports the hypothesis that the higher reputation stakes in friendships refrain participants from cheating for a friend.

The minimal cheating by friends appears to be at odds with previous research about social distance and reciprocity. Previous experiments have found that individuals are more likely to engage in reciprocity when there is less social distance between them, such as when they know each other, when they communicate, when they interact repeatedly, or when they interact in smaller groups (e.g., Axelrod, 1984; Bó, 2005; Brewer & Kramer, 1986; Buchan, Johnson, & Croson, 2006; Hoffman, McCabe, & Smith, 1996). However, in the present experiment, participants were *less* likely to engage in reciprocal cheating after discussing with a friend than they were with an acquaintance, despite being closer to the friend. We suggest that these seemingly disparate findings can be reconciled by the different goals of reciprocity. When people could reciprocate toward to a morally good outcome, then closer social distance facilitates reciprocity. When people could reciprocate toward to a morally bad outcome, then closer social distance might suppress this kind of corrupt reciprocity, at least in some cases. The reason may be that closer social distance enhances people's concern for

reputation, rather than directly motivating reciprocity. When reciprocity also means better reputation, they reinforce each other. Whereas when reciprocity means worse reputation, they contradict each other, and friends can preserve their reputation by suppressing reciprocity.

Our work broadly relates to the emerging literature on social cheating (Erat & Gneezy, 2012). Previous studies emphasize people's flexibility in using altruism as a cover for self-interest. This can take the form of either unilateral cheating where cheaters can act alone to benefit both themselves and others (Gino et al., 2013; Wiltermuth, 2011) or collaborative dishonesty where all parties must cheat to gain benefits (Kocher et al., 2017; Weisel & Shalvi, 2015). In these previous studies, participants were more likely to engage in social cheating than individual cheating. Further, one study found that group discussion exacerbated collective cheating (Kocher et al., 2017). In contrast, the present experiment examined *pure* social cheating—that is, when a person cheats to benefit others without any direct benefit to themselves. Cadsby et al. (2016) also studied this kind of pure social cheating and found, similar to the present study, that participants sometimes cheated for ingroup members at the expense of an outgroup member (but not as much as for themselves). Our experiment further distinguished cheating for a friend versus an acquaintance and found that friendship curbed the temptation to cheat with communication, relative to cheating for an acquaintance with communication.

In contrast to previous laboratory experiments, the present experiment was conducted in the natural field setting of a school classroom. Of course, cautions apply when drawing general implications. For example, the current participants were from a specific age group and cultural environment. We think an intriguing question for future research is to compare social cheating across people from different backgrounds. For studies on pure social cheating, the present one and Cadsby et al. (2016) were conducted in urban areas of China (Yangzi Region). It would thus be interesting to examine social cheating in other areas or countries with different cultural expectations about dishonesty (Gächter & Schulz, 2016). Also, the current experiment used a piece-rate incentive, and future research could instead examine a competitive environment with a limited number of prizes. For instance, participants might be less willing to cheat for an acquaintance in a competition because cheating could reduce their own chance of getting the prize.

In closing, we emphasize that social cheating is a common source of problems and unfairness in many spheres of life. Cheating in the classroom poses an important challenge for educators since one of the main purposes of education is to help students develop high moral standards in their everyday lives. If students begin cheating in school, they may start down a slippery slope where they come to seek advantages by unfair means. The current experiment suggests that a possible antidote might lie in healthy friendships, as advocated by Cicero more than two thousand years ago. At least in some cases, friends might bring out the best in each other, offering some protection against the temptation to collude toward ill purposes.

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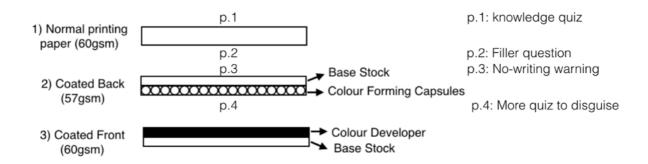Axelrod, R. (1984). *The Evolution of Cooperation*. New York, NY: Basic Books.

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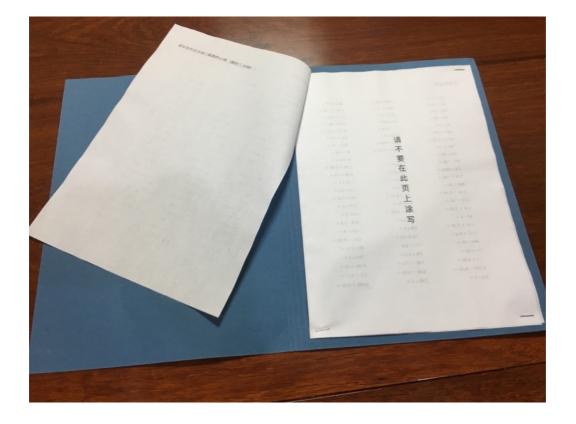
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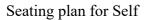
**Appendix**

*Carbonless Copy Paper*

Each participant was presented with a closed manila folder containing three papers. The uppermost paper is a 60gsm normal printer paper, the middle paper is an upper carbon sheet (52gsm) ("coated back") and the bottom paper is a carbon sheet ("coated front"). White carbonless copy paper looks identical to regular white printer paper but has a chemical coating. When the upper carbon sheet is placed over the lower carbon sheet, pressure (e.g., a pen mark) on the upper carbon sheet makes an identical mark on the lower sheet. The knowledge quiz is printed on the first page (p.1), and the filler question is printed at the back of upper carbon sheet (p.2). We also printed a "no-writing" warning in the front of coated back paper (p.3). Since all three papers are thinner than normal 80gsm printing paper, at the back of the upper carbon sheet (p.4), we printed some more artificial questions to disguise the imprints on the bottom paper. Both the coated back paper and the coated front paper are stamped on the manila folder (see the sample of knowledge quiz below).
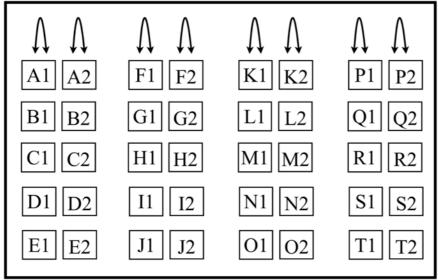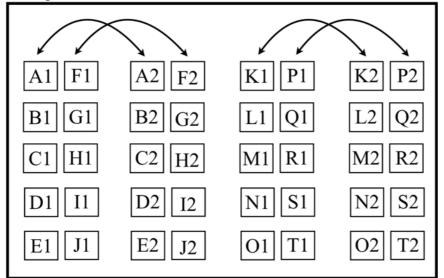
*Seating Plans*

Below we present the seating plans for each experiment condition. A typical classroom has 40 seats and these seats, represented by boxes in the figures below, are arranged by 5 rows and 8 columns. There is a corridor in every two columns. Children were asked to voluntarily form friend pairs and we labeled each pair with the same capital letter. For example, A1 and A2 were a pair of friend, so did B1 and B2, etc. The seating plan is arranged this way to facilitate discussion and silence conditions in the grading process. The arrows indicate how the test sheets were swapped before grading.

Seating plan for Self



Seating Plan for Friend in Silence

Seating plan for Friend with Discussion

| A1 A2 | F1 F2 | K1 K2 | P1 P2 |
| B1 B2 | G1 G2 | L1 L2 | Q1 Q2 |
| C1 C2 | H1 H2 | M1 M2 | R1 R2 |
| D1 D2 | I1 I2 | N1 N2 | S1 S2 |
| E1 E2 | J1 J2 | O1 O2 | T1 T2 |

Seating plan for Acquaintance in Silence

| A1 A2 | F1 F2 | K1 K2 | P1 P2 |
| B1 B2 | G1 G2 | L1 L2 | Q1 Q2 |
| C1 C2 | H1 H2 | M1 M2 | R1 R2 |
| D1 D2 | I1 I2 | N1 N2 | S1 S2 |
| E1 E2 | J1 J2 | O1 O2 | T1 T2 |

Seating plan for Acquaintance with Discussion

| A1 F1 | A2 F2 | K1 P1 | K2 P2 |
| B1 G1 | B2 G2 | L1 Q1 | L2 Q2 |
| C1 H1 | C2 H2 | M1 R1 | M2 R2 |
| D1 I1 | D2 I2 | N1 S1 | N2 S2 |
| E1 J1 | E2 J2 | O1 T1 | O2 T2 |