Can public recognition reward backfire? Field experimental evidence on the retention and performance of volunteers

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Abstract

We examine the effects of offering non-financial incentives on volunteers' dropout rates and performance using a randomized controlled experiment embedded within an existing volunteer tutor program of BRAC in Bangladesh. We find that dropout rates increase when volunteers are offered a performance-contingent public-recognition certificate, while dropout rates remain unchanged when they are offered a performance-contingent certificate to be awarded privately. Despite dropout rate increases by almost half for the most desirable volunteers, the treatment improves overall student performance because the incentives motivate performance among volunteers with low past achievement.

Keywords: Non-financial incentives; public recognition; volunteer; prosocial; motivation; social reputation; retention.

JEL Codes: O15; I25; J22; J24; H4

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1. Introduction

In many countries, between approximately a quarter and a half of the adult population volunteer their time without pay to help organizations deliver services (such as education, health, and religious services) to individuals and communities.[1] The value of their volunteering hours accounts for close to 2 percent of GDP.[2] However, volunteers tend not to stay long with the organizations for which they volunteer. For example, in the United States, one third of volunteers in 2005 did not continue their work in 2006 (CNCS, 2007).[3] Recognizing the benefits volunteers bring and the difficulty with retaining volunteers, governments and organizations devise various strategies to encourage volunteerism. One strategy commonly advocated by popular volunteer management books is to use awards, certificates, and public recognition to help retain effective volunteers (Connors, 2011; McCurley & Lynch, 2011). For instance, McCurley and Lynch (2011) recommend that organizations get a volunteer's picture in the paper for outstanding accomplishment and give a plaque, certificate, or trophy for most improved results.[4] Many organizations also publicly reward volunteers with awards on the basis of their dedication to and impacts on the organization. Although widely recommended and practiced, there is sparse field experimental evidence regarding the impact of public-recognition rewards on the retention and performance of volunteers.

The motivations for volunteering may differ among individuals and interact with rewards and incentives in a way that creates an effect contrary to what volunteer organizations intend.[5] Individuals may volunteer for altruistic or warm-glow (impure altruism) reasons (Andreoni, 1989;

[1] For example, the volunteer rate was 24.9 percent for the United States in 2015 (BLS, 2016), 31 percent for Australia in 2014 (ABS, 2015), 42 percent for England in 2014-2015.

[2] 2.2 percent of GDP in the U.S. (Lough et al., 2007), 1.4 percent of GDP in Australia (ABS, 2015), and 1.7 percent of GDP in Bangladesh (BBS, 2011).

[3] The volunteer retention crisis has also been found to be acute in developing countries (Alam, Tasneem & Oliveras, 2011; Paradis & Usui, 1987).

[4] The advice to use awards, certificates, and public recognition to help retain effective volunteers is ubiquitous. Hager and Brudney (2011) advise American charities interested in increasing retention of volunteers to invest in recognizing volunteers. The national volunteering strategy for Australia in 2011 includes conducting a national volunteer awards program, celebrating volunteers' achievements through certificates or social gatherings, and nominating volunteers for public awards (Australia. Department of the Prime Minister and Cabinet, 2011). NHS England's practical guide for recruiting and managing volunteers suggests public awards for special achievement (NHS England, 2017).

[5] Conventional economic theories suggest that the use of rewards and incentives may help in recruiting and retaining the right workers and may also improve their efforts (e.g., Lazear, 2000; Dal Bó, Finan & Rossi, 2013), whereas behavioral economic theories and evidence suggest that the use of incentives, whether monetary or non-monetary, can have little effect or even unintended consequences (e.g., Frey, 1994; Frey & Goette, 1999; Bénabou & Tirole 2003; Bénabou & Tirole, 2006; Chen et al., 2010; Delfgaauw et al., 2021).

Andreoni, 1990). They may also volunteer out of social-image concerns, because they would like to be perceived as prosocial or other-regarding (Bénabou & Tirole, 2006).[6] However, Bénabou and Tirole (2006) show that incentives and publicity may decrease the prosocial activities of individuals who are concerned about social reputation, because material rewards cast doubt about the true motives for which good deeds are performed. Thus, it is theoretically ambiguous whether the use of non-financial incentives (NFI) in the form of awards, certificates, and public recognition will necessarily help volunteer organizations retain and incentivize volunteers.

In this paper, we examine whether offering a performance-contingent certificate to be awarded in a public ceremony and a performance-contingent certificate to be awarded privately affect the program dropout rates of volunteer tutors and the academic performance of their students. Specifically, we evaluate the effectiveness of these NFI schemes using a natural field experiment embedded within the flagship *Chhatrabandhu* (CB) program of the non-government organization (NGO) BRAC in Bangladesh. The CB program is an existing nationwide program that involves more than 40,000 volunteer tutors and 1,400 schools in 55 districts across Bangladesh. BRAC implements the experiment among 4,162 volunteer tutors who provide free after-school tutoring services in mathematics and English to more than 5,000 underprivileged secondary students in 495 schools. Because the participants are unaware of the experiment, this study occurred in a natural field setting (Harrison and List, 2004) and the results are likely to have external validity for this kind of volunteering, at least in the context of Bangladesh.

In the experiment, volunteer tutors are assigned randomly to one of three treatments and they learn about their respective treatment several months *after* they have started the CB program. In the first treatment group, BRAC offers a certificate of excellence ("superior certificate") in a public ceremony at the end of the two-year program to volunteer tutors whose students' performance exceeds a certain threshold. This performance-contingent aspect resembles the practice for organizations to publish their volunteer award criteria which specify the basis on which they recognize the contributions and impacts of the volunteers. Each volunteer tutor receives a formal letter and phone call from BRAC explaining the treatment. If the volunteer tutors do not meet this threshold requirement for a superior certificate, they instead receive a certificate of appreciation

[6] The literature also suggests many other motivations for volunteering. For example, it is possible that individuals volunteer under social pressure, because they dislike saying no when asked (DellaVigna, List & Malmendier, 2012). Individuals may also volunteer to reciprocate (Manatschal & Freitag, 2014). For a list of various other motivations for volunteering, see Bussell and Forbes (2002) and Clary et al. (1992).

for their program participation ("regular certificate") in private upon program completion. This regular certificate is BRAC's status-quo policy for all volunteer tutors who complete the CB program, including those who work with schools that are not part of our field experiment. The superior certificate may serve as an incentive to those who may use the certificate to improve their labor market outcomes, while the ceremony publicizes the involvement and performance of certain volunteers to the community. The second treatment group differs from the first only in the way the certificates are awarded: they are given to the volunteers in private upon program completion, but the performance requirement for awarding the superior certificate is the same. This superior certificate may still serve as an incentive, even though the community may not necessarily know about their participation, performance, or reward, unless the volunteers choose to reveal them. Lastly, there is a control group in which each volunteer privately receives a regular certificate upon program completion, as is the case for volunteers outside the experiment.

The experiment yields several novel findings that may help us understand the interplay between public-recognition rewards, participation, and performance. First, we find that offering the performance-contingent public-recognition certificate increases the program dropout (attrition) rate of volunteer tutors by 22 percent, but that offering the performance-based private-recognition certificate does not. Second, we find that the public-recognition treatment increases the dropout rates of high-achieving volunteers (i.e., those with own past achievement at or above the median) by approximately 50 percent, while it has no effect on the dropout rates of low-achieving volunteers. Third, although offering the public-recognition reward backfires with regards to retention of volunteers, the treatment improves overall student performance. Specifically, average students' performance in the standardized mathematics and English tests that we designed improves significantly (by 0.14 to 0.16 standard deviations) if their tutors are in the public-recognition treatment group. Although dropout rates rise among high-achieving tutors, the public-recognition treatment effectively incentivizes low-achieving tutors to improve their students' performance. These effects are present whether we include or exclude scores for students whose tutors dropped out of the program. Our results are also robustness to alternative timing of volunteers' dropout decision.

The findings that dropout among CBs and student performance respond to the public-recognition treatment but not the private-recognition treatment suggest that CBs are concerned with the visibility associated with obtaining the public-recognition reward but not the signaling

value of the superior certificate per se. To investigate the potential explanations for the findings, we focus on two prominent mechanisms that are related to social-image concerns given that significant effects are observed for the public-recognition treatment. The first is the type of social-image concern in Bénabou and Tirole's (2006) model where volunteers are concerned with their good deeds being misconstrued as their desire for material rewards. In Bénabou and Tirole's (2006) model, a key condition for this incentive backfire effect to occur is that there is a common belief that those who derive pleasure from helping others are also those who weakly prefer rewards. Independent surveys of parents, school teachers and administrators, and volunteers not partaking in the experiment confirm that people hold the belief that prosocial preference and reward preference of volunteers are positively correlated. This positive correlation implies that volunteers who have less to gain from the public-recognition reward will drop out to avoid being perceived as reward seeking when the NFI scheme is introduced. Volunteer tutors with outstanding academic records are less likely to gain from the public-recognition reward, but more likely to risk being perceived as reward seeking for participating in the program. In contrast, the visibility associated with the public-recognition reward may bring volunteer tutors with weak academic records labor market returns which more than compensate for the negative perception associated with being reward seeking. As we find that volunteers with high past academic achievement are more likely to drop out of the program that awards performance-contingent public-recognition certificate, while volunteers with low past academic achievement respond positively to the incentives, the evidence is consistent with this form of social-image concern.

The second possible mechanism is that the incentive backfire effect channels through the social-image concern with respect to success and failure. For example, if volunteers prefer to be perceived as successful, they may drop out of the public-recognition treatment group because the reward may expose their *potential* failure to the public. However, we find that dropout rates are higher among high-achieving volunteers who are more likely to meet the performance threshold. Alternatively, one may argue that the public-recognition treatment exposes high-achieving volunteers to the risk of tarnishing their reputation of success. In this case, high-achieving volunteers who are less confident or more loss averse would be expected to drop out. We also do not find supportive evidence. Thus, this second form of social-image concern is unlikely to be the main mechanism.

Finally, we also examine a range of alternative interpretations unrelated to image concerns. For example, the performance-contingent certificate may signal to volunteers that the volunteering task is difficult, leading to increased dropout rates. Alternatively, introducing the performance-contingent certificate may shift a volunteer's decision frame from a prosocial frame to a challenge or performance frame. We do not find much support for these alternative interpretations.

This paper is closely related to the empirical studies that analyze the effects of incentives on prosocial behaviors, the effects of non-financial rewards on participation and performance, and the role of social-image concerns and publicity.[7] For example, using observational data, Carpenter and Myers (2010) find that the positive effect of monetary incentives on volunteer firefighters' time commitment declines with their concern for social reputation. Ariely et al. (2009) show in a laboratory experiment that monetary incentives are effective in encouraging subjects to exert greater effort in a real-effort tasks that lead to increased charitable donations when subjects' efforts are made in private, but not when their efforts are made in public. In contrast, Ashraf et al. (2014) find that publicly visible non-financial awards are more effective than financial rewards in incentivizing agents to sell condoms. Similarly, Ashraf et al. (2020) find in a field experiment in Zambia that making career incentives salient improves the pool of talented applicants for nurse positions in the public sector and leads to improved health outcomes in communities served by the applicants who are eventually hired. Callus (2017) shows in a natural field experiment at Wikipedia that symbolic awards for voluntary editors who use pseudonymous online identities are effective in retaining them when the awards bring no benefit for their future career opportunities. However, less is known about whether providing public-recognition rewards may impact *both* the participation *and* performance of *volunteers*, contrary to the intentions of volunteer organizations.

We believe that our findings shed new light on an important, yet previously undocumented, tradeoff that volunteer organizations face. First, we demonstrate that using a public-recognition award that may yield career opportunities to incentivize volunteers can backfire on retention, especially among those whom volunteer organizations presumably most desire. This backfire effect, previously undocumented in the literature, raises an important question regarding the strategy for volunteer organizations to use awards, certificates, and public recognition that are

[7] For examples of studies examining the effects of financial incentives, see Bandiera et al. (2007) on incentives for managers; Muralidharan and Sundararaman (2011), Duflo, Hanna, and Ryan (2012), and Lavy (2002) on incentives for teachers; Lazear (2000) and Gneezy and List (2006) on incentives for workers; Leuven, Oosterbeek, and van der Klaauw (2010) on incentives for students; Gneezy and Rustichini (2000) on incentives for children volunteers.

linked to performance in order to retain effective volunteers. Second, despite the seemingly adverse selection effect of the performance-contingent public-recognition award on retention, we find that the reward effectively incentivizes low-achieving volunteers, leading to an overall improvement in student outcomes. Thus, public-recognition rewards may alienate high-quality volunteers, but they may also attract individuals motivated by rewards and publicity that may help their careers, incentivizing them to perform. The net effect on the quality of services delivered depends on the extent of this tradeoff. We demonstrate that although offering public-recognition rewards to volunteers may lead to an underrepresentation of volunteers with characteristics associated with quality performance, it can still effectively incentivize those self-selected into the program to perform, leading to better service quality. If a volunteer organization's priority is performance, then performance-based public-recognition rewards can be especially effective.

2. Institutional background

2.1. The context

This study focuses on volunteers who provide after-school tutoring and mentoring services to poor children living in rural Bangladesh. Although Bangladesh has been remarkably successful at improving access to primary education, many students do not continue onto secondary education in Bangladesh, and most of those who do, drop out early. In 2015, the dropout rate for secondary education was 40.3 percent, with 19 percent of the dropouts leaving school in grade eight alone (BANBEIS, 2015).

Past studies suggest that the provision of remedial education and after-school or out-of-school tutoring can help improve students' educational outcomes (e.g., Banerjee et al., 2007; Carr & Wang, 2018; Islam and Ruthbah, 2019; Hassan et al., 2021; Hassan et al., 2023). However, poor children in rural Bangladesh tend to lag behind their urban and rural counterparts academically, because they attend poor-quality schools and their parents are often not literate enough to help with their school work nor rich enough to afford private after-school tutoring (Islam, 2019). BRAC initiated the *Chhatrabandhu* Program by utilizing local educated volunteers to provide free after-school tutoring services with the goal to improve the educational outcomes of disadvantaged students in rural Bangladesh.

2.2. BRAC's *Chhatrabandhu* (CB) program

BRAC introduced the CB Program in 2007 with the main objective of improving the educational outcomes of disadvantaged secondary school students in rural Bangladesh. Working with non-government schools, the program recruits local educated individuals who are willing to volunteer their time and effort in order to provide after-school tutoring to lower secondary school students (grades 6 to 8).[8] According to BRAC, these volunteer tutors are revered as "social philanthropists" for their service to the community and are called *Chhatrabandhu* – friend of the students.

Typically, CBs are local youths who live in the same village as the students, have completed their secondary education (i.e., passed the secondary school certificate (SSC) examination in grade 10), and are currently studying, working part-time, or unemployed. Most have had some experience tutoring or teaching children in their own villages. As CBs, they provide free private tutoring to poor and disadvantaged students in mathematics and English on a regular basis for two years. The main idea of the program was that providing free tutoring to these underprivileged students would significantly improve their achievement in the grade eight public national examination, the Junior School Certificate (JSC),[9] and reduce dropouts from secondary schools in rural areas. On average, a CB meets with their student two to three days per week and spends about an hour per visit.

BRAC expanded the operation of the program in Bangladesh from one district in 2007 to 55 districts in 2015. By 2015, the program was available in 1,400 schools in 151 sub-districts of Bangladesh. More than 40,000 volunteers were involved in the program throughout the country. Participating schools are always located in areas in which BRAC has a local branch from which it can operate the program. BRAC branches are spread throughout all districts and regions of Bangladesh. With the help of school teachers, guardians, and school managing committee (SMC) members, BRAC local program staff prepare a list of potential students who are currently enrolled in grade 6 or 7 for CB assignment. Program staff then interview the parents of these students to identify their socio-economic status. Students from low-income households are given priority. CBs are selected and matched with students. Anyone who expresses an interest in participating in the

[8] Most secondary schools in Bangladesh are labelled non-government schools because they are managed primarily by the local community, even though the teachers' salaries and operating expenses come from government sources.
[9] The JSC and SSC exams are the two most important school exams and are conducted nationwide at grades 8 and 10, respectively. The results of these exams are used to determine admission to the next level at secondary and higher secondary level schools.

program and meets the minimum education qualification requirement of having the SSC is recruited as a CB. Thus, CBs are often high school graduates, current college students, college graduates, housewives, or retired professionals. After program staff have finalized the lists of CBs and students, they meet with CBs, parents, teachers, and SMC members jointly to perform matching. The majority of CBs are paired with one student, though some are paired with two. Typically, CBs are matched to students who live relatively close to them, and the matching is done on the basis of a mutual understanding among all parties involved to ensure that students, parents, and CBs are all at ease with the match. The CBs receive training before starting the program. BRAC provides six days of intensive training to familiarize them with the standard curricula and learning materials. Retired or high performing school teachers from the area conduct the training on teaching practices and provide a common teaching guideline. Program staff also conduct a separate day of training to ensure that each CB is familiar with the goals and objectives of the program. Upon completion of the training, CBs begin their volunteer assignment and continue to receive ongoing support from BRAC program staff.

3. Experimental design

BRAC embedded a randomized controlled experiment within its existing CB program. In April 2014, BRAC selected 495 non-government secondary schools for this experiment. The selected schools are located in 45 districts (78 sub-districts) in which BRAC has the local resources to implement the field experiment.[10] The experiment included 4,162 CBs, who between June and August of 2014 were matched with 5,730 grade 6 or 7 students from disadvantaged families. 2,677 CBs have only one student, whereas the rest have more than one student.

We conducted a baseline survey on these CBs during January and February of 2015. The survey collected information about the CBs' demographic, social, and economic characteristics, experience with their students to date, as well as past academic achievement. The survey also collected information about their students, such as their performance in the grade 5 national public exam, socio-economic status, and relationship with the CB.

Each of the 495 schools was randomly to one of three treatment groups. The three treatment groups are: (T1) the public-recognition treatment group; (T2) the private-recognition treatment group; and (T3) the participation-based treatment group. Table 1 presents the numbers of schools,

[10] There are 64 districts in Bangladesh. The CB schools included in this study are spread all over Bangladesh.

CBs, and students by treatment group. The treatments were announced to the CBs in April 2015, roughly eight months after they had begun the two-year program. Note that CBs were not informed about the other treatments they were not assigned to. Appendix A shows the announcement letters explaining the treatment a CB belongs to. As randomization was conducted at the school level and secondary schools in rural Bangladesh are generally located far from each other, the possibility of information spillover about the other treatments was near zero.[11]

[Table 1]

In the public-recognition treatment group (T1), each CB was informed that they would receive either a "superior" certificate (certificate of excellence) in a public ceremony organized by BRAC or a "regular" certificate (certificate of participation) in private if they completed the program. The level of certification depended on how well their students performed in the grade level examination at the completion of the program compared to the grade 5 national examination.[12] The public ceremony was held at the local BRAC office, where BRAC officials, the relevant school administrators, village liaison officers, other volunteers, and invited family members and friends of CBs were present. In order to receive the superior certificate, at least one of the CB's students must have achieved an increase in average grade points between the two grade level examinations in mathematics and English. Each CB received a formal letter from BRAC explaining the performance criteria and how they would be evaluated and rewarded based on their performance. Research assistants also called each CB separately to make sure that they understood the performance criteria and how the two types of certificates would be awarded.

In the private-recognition treatment group (T2), the CBs would also receive a superior certificate upon program completion if their students performed better than the performance threshold (as in T1), but the certificate was given *privately*, rather than in a public ceremony. Thus, the main difference between T1 and T2 was that in T2 no public ceremony would take place to award the performance-contingent superior certificates. It is also important to note that the public-

[11] Schools in our treatment and control groups are located even further from each other as not all schools from an area are included in the experiment. Specifically, most schools are at least 10 kilometers away from another school.
[12] There are two types of grade level examinations conducted at the completion of the program. The first type is the grade 8 national examination, taken by students who were in grade 7 at the beginning of the program. The second type is the grade 7 school-level examination, taken by students who were in grade 6 at the beginning of the program.

recognition treatment does not only influence the visibility of a volunteer's activities and performance, but it also increases the value of the certificate as the public ceremony is a social function that provides networking opportunities that benefit the attending CBs.

In the participation-based treatment group (T3), CBs would receive a *regular* certificate privately, irrespective of how well their students performed upon completing the program. This third group is essentially the control group. The certificate is identical to those that were given to the CBs who failed to meet the performance requirement in the other two treatment groups.[13]

In February/March 2016, we conducted an end-line survey on the CBs in order to collect information about their drop-out status. The drop-out status was initially provided by BRAC in January 2016, and we cross-checked this with the responses directly from the CBs and students in the end-line survey. During this survey period, we also collected the students' academic results from their schools and tested the CBs' students using a standardized test that we designed. We collected both the students' in-school examination results and their grade 8 public examination (JSC) results. The certificates were issued and the award ceremonies were completed in September 2016. People were informed about the ceremonies in the month prior to the ceremonies. The timeline of the program and the experiment is shown in Figure 1.

[Figure 1]

4. Field Experiment Data

4.1. Characteristics of CBs and students and verification of randomization

This section provides summary statistics and evidence that we were successful in randomizing the assignment of treatments. Our tests of balance concentrate on the characteristics of CBs and students that are likely to influence the CBs' dropout (participation) decisions and performance. For students, we focus on their past academic performance, age, gender, and poverty status, and whether the CB meets the family weekly. For CBs, we focus on their age, gender, educational attainment, prior experience in private tutoring, past academic achievement, prosocial motive for volunteering, career motive for volunteering, and number of students tutored.

Table B.1 in appendix B reports the means of the CBs' and students' characteristics by treatment and demonstrates that these characteristics are balanced across treatments. The *p*-values

[13] See Appendix C for translated versions of the certificates.

for both the joint tests of differences and the differences between T1 and T3 (control), and T2 and T3 are all above 0.10. Briefly, the CBs are on average 20 years old, majority females (56 percent), and have completed 11 years of education. About one third of CBs had prior experience in private tutoring before joining the program. The average grade points of the students' mathematics and English components of the PSC are roughly 3.6 and 3.2 out of 5, respectively. The students are on average 13 years old, majority girls (60 percent), and majority poor (~80 percent), as reported by the CBs. Roughly 34 percent of CBs spent more than 6 hours per week with their students at the time of the baseline survey. Roughly 51 percent of CBs' own past achievement is below the mean in the sample.

4.2. Key outcome measures

We focus broadly on three main outcome variables: (1) whether the CB drops out of the program right before performance is measured; (2) the student's average grade point in the national exam; and (3) the student's standardized test scores.

All CBs included in the experiment were informed about the treatment in April 2015 (eight months after commencing the program). By the end of 2015, which is roughly eight months after treatment announcement, approximately 22 percent of the CBs had already dropped out of the program. Dropping out means lower optimal prosocial activity. Once a volunteer tutor drops out of the program, she stops contributing in the program, and her contribution is lower than it would have been if she had continued participating in the program. As we focus on dropout before performance was measured and revealed, we maximize the number of dropouts we can identify while capturing the volunteers' intention to relinquish their chances to obtain the superior certificate. In a robustness section, we examine the sensitivity of our results to the timing of dropout decision by measuring dropout two months after treatment announcement.

We also measure the performance of CBs using their students' standardized test scores in addition to their students' average grade points in the national public examination or in-school examination. We include standardized tests because there is no existing standardized exam for grade 7 students and there are also concerns about using average grade points from the grade 8 JSC examinations, which have been marred by allegations of question leaks and small variation in grade points (Emran et al. 2020). We designed the standardized tests based on materials drawn

from the relevant textbooks.[14] Separate tests were conducted for students in grades 7 and 8. Program staff administered the tests in the classrooms at the schools.[15]

We randomly selected one student to sit for the standardized tests for each CB (note that some CBs have two students and students per CB are balanced across treatments). There were 3,024 students out of the 4,162 randomly selected students participated in the tests; among them, 516 were tutored by CBs who dropped out of the program. Thus, 73 percent of the selected students participated in the test. The main reasons for this test-day absenteeism include that students could not be traced, were on leave, and had dropped out or moved elsewhere.[16] The participation rates in the standardized test sample are similar across treatments and the characteristics of the CBs and the test-taking students are also balanced across treatments (Table B.2 in appendix B). As the results imply that non-random sample selection is not a concern, we rely on OLS estimates to make inferences, rather than using Lee's (2009) bounds or inverse probability weighting methods, for example.[17] Because BRAC did not assign new CBs to students whose CBs dropped out of the program, there is also no reason to suspect other forms of selection bias. We find that the students answered an average of 3.7 questions correctly out of the seven math questions (53 percent), and 2.9 questions out of the five English questions (58 percent).

5. Results

5.1. Dropout effects of offering performance-contingent non-financial incentives

We examine the treatment effects on the likelihood of CBs dropping out of the program. Figure 2 shows the average effect of the treatment on the likelihood of CB dropping out of the program by treatment group. Overall, the public-recognition treatment (T1) leads to higher dropout rates (4.5 percentage points) than either the private-recognition treatment (T2) or the participation-based control group (T3). The 95 percent confidence interval of the mean of T1 does not contain the

[14] The test items consist of multiple-choice questions with four to five response options. The test is intended to assess problem-solving capacities in mathematics (e.g., geometric skills and complex worded problems), general knowledge, and English comprehension requiring students reasoning skills. Separate tests were conducted for each grade. Local school teachers and educators were consulted to ensure that the tests are appropriate for the grade level.

[15] CBs played no role in administering the test, and they were not informed about the content of material to be covered in the test. We recruited independent markers (retired school teachers) to evaluate the test papers.

[16] The test-day absenteeism rate of 27 percent is not unusual in the rural setting of a developing country. For example, approximately 20 percent of children were absent on test days in the case of the Balsakhi Program in India administered by Pratham (see Banerjee et al., 2007) and a study in Kenya by Duflo et al. (2011).

[17] We check the data on the public or in-school examination performance and the results show that data availability and characteristics of CBs and students with data available are balanced across treatments (Table B.3 in appendix B).

mean of T2 and the mean of T3. The dropout rates of CBs do not differ much between T2 and T3, as their 95 percent confidence intervals overlap almost completely. Thus, offering the performance-contingent certificate in a public ceremony increases dropout rates, while offering the performance-contingent certificate in private does not affect dropout rates.

As the CB program aims to improve the educational outcomes of disadvantaged students in rural Bangladesh, BRAC is particularly interested in retaining CBs who are more effective in help students improve performance. These desirable CBs may be those who themselves have strong past academic achievement or past teaching experience, where prior studies on teacher quality have shown mixed findings (Hanushek & Rivkin, 2006).

To see what characteristics of CBs are potentially more desirable for BRAC from a performance perspective, we regress student performance on a set of CB's characteristics by restricting the sample to CBs in T3 who did not dropout of the program to ensure that we measure the correlation between their student performance and their own, without the influences of the performance-contingent certificate treatments. Because of this sample restriction, the estimates reported in Table 2 are likely to be noisy. Panel A in Table 2 shows that CBs with strong past academic achievement (i.e., achievement is at or above the median) tend to have students who experienced increased performance in the public examination (columns 3 to 6). When we focus on the estimates for standardized tests where we have fewer observations (30% less), the coefficients become statistically insignificant, but the coefficient remain large for mathematics ($p<0.15$). When we have CB's past academic achievement and private tuition experience as the only explanatory variables, the coefficient for past academic achievement becomes larger (panel B). Thus, there is assortative matching of tutors and students on the basis of achievement. Other CB's characteristics predictive of student performance do not show a consistent direction of prediction across specifications. Although these are just correlations, the results suggest that recruiting and retaining CBs with high past academic achievement may bring greater impacts on student performance.

[Table 2]

One major concern is whether offering the performance-contingent certificate in a public ceremony increases the likelihood of desirable CBs dropping out of the program. Figure 3 shows that offering the performance-contingent certificate in a public ceremony increases the likelihood

of these CBs with high past achievement dropping out of the program. The difference in dropout rates between the public-recognition treatment (T1) and the participation-based treatment (T3) is approximately 9.1 percentage points and statistically significant at the 5 percent level for CBs with high past academic achievement (panel A in Figure 3), but it is not statistically significant at the conventional levels for CBs with low past academic achievement (panel B in Figure 3). The difference in dropout rate is almost half of the dropout rate among volunteers in the participation-based treatment group (T3). Thus, the public-recognition rewards appear to alienate the type of volunteers the volunteer organization is particularly interested in retaining.

[Table 3]

Table 3 reports confirm the patterns shown in Figures 2 and 3. The estimates in Column 1 indicate that the public-recognition treatment (T1) significantly increases dropout rates from 0.204 to 0.248, representing a 22 percent increase. On the other hand, the private-recognition treatment (T2) does not have much of an effect on dropout rates. Columns 2 and 3 report estimates for CBs with high past academic achievement and CBs with low past academic achievement, respectively. Similar to the results shown in panel A in Figure 3, column 2 in Table 3 shows that the effect of the public-recognition (T1) treatment on the dropout rates of CBs with high past academic achievement is 0.092 and significantly different from zero at the 1 percent level. This effect represents a 48-percent increase in dropout rates of CBs in the participation-based treatment group. Column 2 also shows that the private-recognition treatment (T2) does not have much of an effect on the dropout rates of CBs with high past academic achievement. Similar to the results in panel B in Figure 3, columns 3 shows that neither the public-recognition treatment (T1) nor the private-recognition treatment (T2) has an effect on the dropout rates of CBs with low past academic achievement. The similarity in estimates between those reported in Figures 2 and 3 and those reported in Table 3 also confirms that characteristics of students and CBs are balanced across treatments overall and by past academic achievement too. Lastly, column 4 in Table 3 shows that the effect of T1 on dropout rate of CBs with low past academic achievement is statistically lower than the effect of T1 on dropout rate of CBs with high past academic achievement.

In summary, there is a strong incentive backfire or crowding-out effect on the participation of volunteers when they are offered a performance-contingent certificate awarded in a public

ceremony. Importantly, the backfire effect is more likely to apply to CBs with high past academic achievement. This effect contradicts the intention of BRAC in retaining volunteers who have characteristics associated with improved students' outcomes.

5.2. Performance effects of offering performance-contingent non-financial incentives

We next examine the effects of the performance-contingent non-financial incentives on student performance. As we have the performance data of students taught by CBs who dropped out of the program and missing observations are balanced across treatments, the results presented below do not suffer from sample selection bias.

[Figure 4]

Figure 4 shows student performance by treatment and type of test/examination. Panels A and B report average students' standardized test scores in mathematics and English standardized tests, respectively. Panels C and D report students' average grade points in the national public examination (grade 8) or in-school examination (grade 7) in mathematics and English, respectively. Panels A and B show that average students' standardized test scores in mathematics and English are significantly higher when their tutors are assigned into the public-recognition treatment (T1) group than when their tutors are assigned into the participation-based treatment (T3) group. On the other hand, panels A and B show that average students' standardized test scores in mathematics and English are similar for CBs assigned into the private-recognition treatment (T2) group and CBs assigned into the participation-based treatment (T3) group. Panels C and D show that average students' grade points in mathematics and English public examination (grade 8) or in-school examination (grade 7) are statistically similar across all treatment groups. These estimates mean that despite the rising dropout rates in the public-recognition treatment (T1) group, volunteers remaining in the program are incentivized to perform, leading to an overall improvement in average student performance in the standardized tests, which are better able to discriminate student performance than the national public and in-school examinations.

Table 4 presents the estimated effects of treatments on student test performance in standardized tests (panel A) and in national public or in-school examination (panel B) after controlling for a set of students' and volunteers' characteristics. The first four columns present the

results for student performance in mathematics, while the last four columns present the results for student performance in English. Columns 1 and 5 focus on students taught by all volunteers, columns 2 and 6 focus on students taught by CBs with high past academic achievement, columns 3 and 7 focus on students taught by CBs with low past academic achievement, and columns 4 and 8 test differences in the treatment effects between students whose CBs have high past academic achievement and students whose CBs have low past academic achievement.

[Table 4]

Panel A in Table 4 shows that students whose CBs are assigned into the public-recognition treatment (T1) group perform significantly better than students whose CBs are assigned into the participation-based treatment (T3) group in both standardized mathematics (column 1) and English (column 5) tests. The difference in mathematics standardized test scores is 0.14 standard deviations, whereas the difference in English standardized test scores is 0.16 standard deviations. However, students whose CBs are assigned into the private-recognition treatment (T2) group perform similarly to students whose CBs are assigned into the participation-based treatment (T3) group in both mathematics (column 1) and English (column 5) standardized tests. On the other hand, columns 1 and 5 in panel B show that students of CBs assigned into all three treatment groups have similar average grade points in the national public or in-school mathematics and English examination. The effects of T1 and T2 on the national public or in-school examination performance are mostly positive but not statistically different from zero. As these examinations are less able to discriminate student performance than the standardized tests we designed, the noisier estimates are not surprising. Since there are four test score variables, we also check whether the results are robust to multiple hypothesis tests by using the family-wise-error-rate-adjusted *p*-values corrected for multiple hypothesis tests (Westfall & Young, 1993). The estimated effect of T1 on English standardized test remains robust given that the family-wise-error-rate-adjusted *p*-value is 0.087, while the estimated effect of T1 on mathematics standardized test becomes noisier given that its family-wise-error-rate-adjusted *p*-value is 0.114, which is slightly larger than what conventional significance levels require. The results mean that even though the public-recognition treatment increases the likelihood of CBs dropping out of the program, it incentivizes CBs

remaining in the program to perform, leading to an overall improvement in students' mathematics and English standardized test performance.

When we look at the mathematics and English standardized test performance, only students whose CBs have low past academic achievement experience statistically significant improvement (columns 3 and 7 in panel A of Table 4), if their CBs are assigned into the public-recognition treatment (T1) group but not if their CBs are assigned into the private-recognition treatment (T2) group. The estimates are robust to multiple hypothesis tests according to the family-wise-error-rate-adjusted *p*-values. Students taught by tutors with high academic achievement do not experience statistically significant improvement in their standardized mathematics or English test performance whether they are assigned into the T1 group or the T2 group. Lastly, for student performance in the national public examination or in-school examination, there are no statistical differences across treatment groups by the CBs' past academic achievement. Table 4 indicates that T1 incentivizes high-achieving CBs to exert greater effort in tutoring.

The findings imply that CBs are concerned with the visibility associated with obtaining the superior certificate but they do not perceive the superior certificate as a signaling device for the labor market. Low-achieving CBs who have more to gain from obtaining the superior certificate in a public ceremony are the ones induced to improve performance. Thus, even though offering the performance-contingent public-recognition certificate discourages the participation of high-achieving CBs who presumably sought after by BRAC, it "crowds in" the motivation of those who self-select to stay in the program and leads to an overall improvement in average student performance. The results imply that non-financial incentives may backfire in one aspect (i.e., high-achieving volunteers drop out), but it may still lead to the desired outcome depending on how the incentives influence those who self-select into participation (i.e., low-achieving volunteers perform strongly).

6. Robustness

We examine two types of robustness. Firstly, we shorten post treatment announcement period to examine the dropout decision. Secondly, we estimate the effects of treatments on student performance by restricting the sample to students whose tutors did not drop out of the program.

6.1. Robustness to the timing of dropout decision

We have focused on dropout decision of CBs right before performance was measured and revealed. By measuring dropout decision over a long post-treatment announcement period but before performance was measured and revealed, we maximize the number of dropouts to be identified while still capture their intention to relinquish their chances of obtaining the superior certificate. Measuring dropout by the end of June 2015 (i.e., within two months of treatment announcement), we find the estimated effect of the public-recognition treatment (T1) on the likelihood of dropping out is 4 percentage points for all CBs (column 1 in Table 5) and 6 percentage points and statistically significant at the 5% level for CBs with high past academic achievement (columns 2). In comparison, when measuring dropout right before the performance measurement period, the estimated effect of T1 on the likelihood of dropout is 4.5 percentage points for all CBs (column 1 in Table 3) and 9 percentage points for CBs with high past academic achievement (column 2 in Table 3). As the effect sizes do not decrease significantly, our results are robust to shortening the timing of dropout decision.

[Table 5]

6.2.Focusing on the sample of students whose tutors did not drop out

We announced the non-financial incentives after CBs started the program and then examined who stayed in the program and whether students, including those whose CBs dropped out, performed better on average. BRAC did not assign new CBs to students after existing CBs dropped out of the program in order to keep the program costs low. In other settings, information about any incentive scheme is typically made available prior to sign-up. The effect of the public-recognition reward on student performance would have been different had the announcement been made in advance in our experiment because CBs who ended up dropping out in our experiment would probably not have joined in the first place.

[Table 6]

We now examine if our results about student performance are robust to excluding all students whose CBs dropped out of the program. Table 6 reports the estimates based on students whose

CBs did not drop out of the program. Overall, our results are reasonably robust to the exclusion of students whose CBs dropped out of the program, even though the estimated effects weaken slightly. Importantly, low-achieving CBs, who did not drop out of the program in response to our treatment and who would most likely join the program due to any pre-announced non-financial incentive, remain significantly responsive to the public-recognition certificate. Specifically, after excluding students of CBs who dropped out, among low-achieving CBs, we find the crowding-in effect of T1 on performance is 0.24 standard deviations for mathematics (column 3 in Table 6) and 0.22 standard deviations for English (column 7 in Table 6). The estimates are robust to multiple hypothesis tests according to the family-wise-error-rate-adjusted *p*-values. These figures are similar to the 0.25 standard deviations for mathematics (column 3 in Table 4) and 0.23 standard deviations for English (column 7 in Table 4) when we include students of CBs who dropped out.

7. Mechanisms: Social-image concerns

The effects on dropout rates and performance are observed when volunteers are assigned into the performance-contingent public-recognition certificate treatment group, but not when they are assigned into the performance-contingent private-recognition certificate treatment group. The main difference between the two treatments is that the reputation of volunteers will be affected when they stay in the performance-contingent public-recognition certificate treatment group that rewards and publicizes strong performance. The beliefs others in the community have about those participating in such a program can then influence volunteers' decision to remain and perform in the program. Thus, we next examine whether social-image concerns explain the findings.

7.1. Social-image concern with good deeds being misperceived as the desire for rewards

The first type of social-image concern is where volunteers are concerned with their good deeds being misperceived for their desire for material rewards (Bénabou and Tirole, 2006). In Bénabou and Tirole's (2006) model, a volunteer has private gains from volunteering and also a reputational gain and loss from volunteering that involves material rewards. On the one hand, volunteering gives the volunteer private gains through their prosocial (other-regarding or altruistic) preference as well as preference for material rewards that are tied to the volunteering activities. On the other hand, the desire to help others gives the volunteer reputational gain while the desire to obtain material reward gives the volunteer reputational loss in the eyes of the community. Of first-order

importance in Bénabou and Tirole's (2006) model, incentive backfire on participation can occur when there is a common belief that a volunteer's prosocial preference and material reward preference are non-negatively correlated. Given this non-negative correlation, when incentive is introduced, the participation in volunteering activities may be perceived as the desire to obtain the material reward. If the gains from the material reward and volunteering are smaller than the reputational loss from being perceived as volunteering for the material reward, then the optimal response is to cut participation.

To examine whether perceptions and second-order beliefs of individuals in our setting are consistent with the features of Bénabou and Tirole's (2006) model for incentive backfire to occur, we conducted separate surveys on volunteers, parents, and school teachers and administrators in areas where the performance-contingent certificate was not offered. To ensure the respondents in the sample had not been influenced by the experimental treatments, we sampled 211 parents of children in grade 6 to 8 but were never taught by the CBs. Similarly, we surveyed 206 volunteers who did not participate in the program during the period of the experiment and 214 school teachers and administrators that were not involved in the CB program. Because we sampled people who did not participate in the experiment, their responses could not influence the experiment and they could not ex-post justify their decisions.

The survey questions focus on several key features of Bénabou and Tirole's (2006) model. First, for there to be an incentive backfire effect on participation, people must hold the belief that volunteers with high prosocial preference also value the performance-contingent certificate highly. When we ask parents and school teachers and administrators what they think the value that people who enjoy volunteering work and who often help others in their community for free would place on a certificate that recognizes their strong performance, 89 percent of the respondents indicate that these people would value the certificate highly (Appendix D reports the results). This figure increases to 91 percent if the certificate is awarded in a public ceremony with networking opportunities. Similar, when we ask volunteers the same questions, the figures are 93 percent and 97 percent, respectively. Thus, the condition – there is a common belief that prosocial preference and reward preference are non-negatively correlated – for Bénabou and Tirole's (2006) form of social-image concern to generate incentive backfire effect is observed in the current setting.[18]

[18] Appendix E shows that this correlation is also statistically positive when we use proxy measures of prosocial preference and reward preference inferred on the basis of CBs' characteristics.

Second, the superior certificate issued by BRAC must be perceived as valuable, especially when it is awarded at a BRAC's district office with networking opportunities. When we ask parents (school teachers and administrators) to choose between two hypothetical tutors (teachers) who both have weak past high school achievement themselves, 96 percent of them prefer to hire the one with a BRAC issued superior certificate than the one without it. Similarly, when we ask volunteers among the two hypothetical tutors (teachers) who they think are more employable, 98 percent of them think the one with a BRAC issued superior certificate is more employable. When we ask volunteers what they think other volunteers would rank the three certificates in terms of their value, 83 percent of them rank the superior certificate awarded in a ceremony with networking opportunities as the most valuable, 75 percent of them rank the superior certificate awarded privately as the second most valuable, and 91 percent of them rank the regular certificate as the least valuable. Thus, performance-contingent public-recognition certificate is perceived as more valuable than the performance-contingent public-recognition certificate and the regular certificate.

Third, people must hold negative perception about those who volunteer in order to obtain certificates and publicity. When we ask parents and school teachers and administrators to rank the sincerity and genuineness of different volunteers in helping others, 71 percent of the respondents rank volunteers participating in a program that does not provide any performance-contingent certificate as more genuine and sincerer than volunteers participating in a program that provides a performance-contingent certificate.[19] Therefore, volunteers in our experiment may be concerned with people misconceiving their prosocial motivation as their desire for the performance-contingent certificate and public ceremony.

Finally, for the crowding-in effect to be present among CBs with low past academic achievement, but incentive backfire effect to be present among CBs with high past academic achievement, the value of the performance-contingent certificate must be considerably higher for low-achieving CBs so that the gains from the performance-contingent certificate more than compensate the reputational loss from being perceived as material reward seeking. The superior certificate and public ceremony are more likely to benefit CBs who do not have a strong resume or track record. Compared to CBs who already have a strong resume, their job prospects are more likely to improve when they are rewarded the superior certificate in a public ceremony and have their strong teaching performance revealed to the community. Indeed, when we ask survey

[19] See Appendix D for the wording of this survey question.

respondents whether volunteers with weak SSC performance or volunteers with strong SSC performance are more likely to pay a fee to obtain the superior certificate, the majority of them (68 percent) think that volunteers with weak SSC performance are more likely to pay a fee for the superior certificate. Thus, the superior certificate is more valuable for volunteers with poor SSC performance than for volunteers with strong SSC performance.

In sum, the perceptions and beliefs of people in our setting are consistent with the features of Bénabou and Tirole's (2006) model for the incentive backfire effect to occur – volunteers with social-image concerns drop out of the public-recognition treatment (T1) due to their concerns that their good deeds being misperceived for their desire for material rewards.

7.2. Social-image concern with respect to success and failure

The second type of social-image concern is where volunteers are concerned with their (potential or future) failure to meet the performance threshold being known publicly. It is possible that CBs dislike being perceived as a failure. A CB's failure to meet the performance threshold requirement will be revealed to others (implicitly) when the superior certificate is awarded in a public ceremony. If this form of social reputational concern is present, the public-recognition treatment (T1) may increase dropout rates by publicly shaming those who fail to meet the performance threshold, albeit implicitly. If this mechanism explains our findings, then dropout rates should be higher for low-achieving CBs because they are less likely to meet the performance threshold than high-achieving CBs. However, we find the opposite: high-achieving CBs are more likely to meet the performance threshold (Table 2) and also more likely to drop out (Table 3).

Alternatively, one may instead argue that high-achieving CBs already have a reputation for being successful given their good academic transcripts (so the superior certificate will not help much), but they have more to lose (in their reputation) if they fail to meet the performance threshold. In this case, the public-recognition treatment exposes high-achieving CBs to the risk of tarnishing their reputation of success. This alternative interpretation is more difficult to rule out. Nonetheless, one may argue that the self-confidence of a high-achieving CB is likely to influence their subjective probability of whether they will meet the performance threshold. Then, a highly confident high-achieving CB may view her probability of failing to meet the performance threshold as low and thus she has a lower likelihood of dropping out of the program. In the baseline survey, CBs were asked to rate whether they joined the program to improve their self-esteem on a

seven-point Likert scale (i.e., greater ratings imply lower level of self-confidence). 33 percent of volunteers rated this reason below seven and we classify them as having a high level of confidence.[20] The dropout rate is actually similar between confident high-achieving volunteers and high-achieving volunteers who lack confidence (Column 1 in Table 7). Relatedly, we may expect the extent of reputational loss to be larger for the more successful high-achieving CBs than the less successful high-achieving CBs. However, the difference in dropout rates between top-end high-achieving CBs (i.e., those with past achievement in the top quartile) and bottom-end high-achieving CBs (i.e., those with past achievement between the median and top quartile) is not statistically different ($p<0.63$; Column 2 in Table 7) when they are offered the performance-contingent public-recognition certificate. Thus, there is insufficient evidence to support the alternative interpretation that high-achieving volunteers drop out because they will suffer greater reputational loss in the event of failing to meet the performance threshold.

In sum, our results are unlikely to be driven by CBs' social-image concerns with respect to success and failure.

8. Other potential explanations and interpretations

8.1. Public-recognition reward signals difficulty

It is possible that the public-recognition treatment leads to the incentive backfire effect through the "looking-glass-self" mechanism that Bénabou and Tirole (2003) formalize. Specifically, offering the performance-contingent public-recognition certificate signals to CBs: (1) the difficulty of the task about which BRAC has private information that CBs lack; and (2) BRAC lacks confidence in CBs' ability to perform the task well. If this mechanism is at play, CBs who drop out of the program are likely to be: (i) those who have a greater likelihood to struggle with the task; and (ii) those who have low confidence about their ability. Our findings in Table 3 that high-achieving CBs are more likely to drop out contradict (i). Our findings in Table 7 that confident and unconfident high-achieving volunteers are equally likely to drop out contradict (ii).

[20] In the follow-up survey, we asked CBs who remained in the program questions regarding their self-confidence. We found that CBs defined as highly confident on the basis of the baseline question about self-esteem motivation for volunteering are statistically more likely to disagree with the statement in the follow-up survey: "Much of the time I don't feel as competent as many people around me." Thus, the proxy for confidence based on question about self-esteem motivation for volunteering is a reasonable measure of self-confidence.

8.2. Framing effects

The introduction of the performance-contingent certificate could potentially shift a CB's decision frame away from a prosocial frame (e.g., Heyman and Ariely, 2004). Given the emphasis on strong performance, the treatment may shift the decision frame to a challenge or performance frame. It is possible that under the challenge or performance frame, the non-financial reward appears too small (relative to the prosocial frame) to sufficiently compensate for the effort, leading to greater dropout rates. This alternative theory predicts that: (i) private-recognition treatment (T2) will increase dropout rates more than public-recognition treatment (T1) will, as the value of the private-recognition certificate is much smaller; and (ii) the introduction of the performance-contingent certificate is more likely to backfire among CBs who would find the challenge and performance costly.

Our estimates do not fully support these predictions: (i) dropout rates are greater for the public-recognition treatment than the private-recognition treatment (Table 3); and (ii) dropout rates are lower among low-achieving CBs (Table 3), who are more likely to struggle with improving students' performance (Table 2).

8.3. Naïve explanations

One naïve explanation of our findings related to dropout is that the availability of performance-contingent public-recognition certificate improves the employability of volunteers in the labor market. This naïve explanation would only work if CBs are able to show the superior certificate to potential employers. However, CBs would only receive the superior certificate if they have met the performance threshold upon program completion. By dropping out of the program, CBs relinquish their chances to obtain the superior certificate. Our results show that being assigned into the public-recognition treatment, without actually receiving the superior certificate in a public ceremony, leads to increased dropout rates. Thus, it is not possible for the public-recognition treatment to increase dropout rates by improving the employability of dropouts.

Another naïve explanation of our findings is that CBs may find the public ceremony a hassle to attend or the ceremony and opportunities for social networking too intimidating, so they drop out to avoid the public ceremony. CBs are not obliged to attend the public ceremony. Even though their names would be announced at the ceremony and their superior performance would be publicized, they do not need to be present at the ceremony to be awarded the superior certificate.

If attending the public ceremony is a hassle or too intimidating, they could choose not to attend the ceremony when invited, rather than dropping out of the program early.[21]

8.4. Social recognition versus networking

The public-recognition treatment rewards CBs with social recognition and also an opportunity to network for employment purposes during the public ceremony. Our finding that the public-recognition treatment is particularly effective for CBs with low past academic achievement to improve students' performance raises the question of whether it is social recognition itself or the opportunity to network with BRAC officers for employment purposes that motivates them. If it is the latter, then rewards in the form of a networking opportunity rather than a public ceremony can also deliver better outcomes.

Given the way the treatment was designed, it is not possible for us to cleanly separate the effect of social recognition and the effect of networking opportunity. Nonetheless, if the performance effect is only driven by the networking opportunity, then the treatment effect is unlikely to be present among CBs who did not view volunteering as an important step towards finding employment in BRAC. Columns 3 and 4 in Table 7 indicate although low-achieving CBs who did not view volunteering as an important experience for finding employment with BRAC tend to perform worse than low-achieving CBs who viewed volunteering as an important experience for finding employment with BRAC, the differences in performance are not statistically significant. The estimates suggest that the performance effect is driven by both social recognition and the opportunity to network for employment purposes, although social recognition itself may be sufficient too.

9. Conclusion

We estimate the effects of non-financial incentives with and without a public-ceremony element on the retention and performance of volunteers by evaluating a randomized field experiment embedded within BRAC's existing volunteer tutor program in Bangladesh. A performance-contingent public-recognition certificate award and a performance-contingent private-recognition

[21] Our independent survey of volunteers who did not participate in the experiment also shows that less than 5 percent of the respondents would consider attending the ceremony as an inconvenience, hassle, or intimidating experience.

certificate award were announced to volunteers several months after they had joined BRAC's program. We find that offering the performance-contingent public-recognition certificate award increases dropout rates among volunteer tutors by approximately 22 percent. On the other hand, offering the performance-contingent private-recognition certificate award has no effect on the dropout rates of volunteer tutors. The incentive backfire effect on retention is driven by volunteers with high past academic achievement. The dropout rates increase by almost half for these volunteers, whom volunteer organizations presumably aim to attract and retain. Although dropout rates increase, students benefit from the performance-contingent public-recognition certificate incentive, on average. The reason is that volunteers who remained in the program, especially those who have low past achievement and who have the most to gain from the public-recognition reward, are incentivized to perform.

We find supportive evidence that the most likely explanation for our findings is that when the non-financial incentive is introduced, volunteers are concerned with their good deeds being misconceived by others as their desire for material rewards. Unless the private gains from the public-recognition reward are expected to more than offset the reputational loss due to the misconception by others, volunteers would reduce their participation. When the program offers a performance-contingent public-recognition certificate award, volunteer tutors with high past academic achievement have more to lose (in reputation) than to gain by participating, while volunteer tutors with low academic achievement have more to gain (in having a superior certificate for labor market purpose) than to lose by participating.

In our setting, the non-financial incentives were announced after volunteers started the program and we focus on examining who stayed in the program and whose students performed better. In other settings, information about any incentive scheme is typically disclosed prior to sign-up and would be more likely to affect recruitment than retention. We can only speculate what might happen in these other settings. Our results suggest that disclosing the incentives prior to sign-up may potentially backfire by attracting the types of volunteers that volunteering organizations are less interested in (from a performance perspective); however, it may still incentivize those who join to perform better. The use of performance-contingent public-recognition certificate awards that may bring career opportunities is likely to attract those motivated by the non-financial incentives to participate actively in the program and perform strongly. In typical market transactions, it is likely the case that those who are the most responsive

to the incentives are the ones who join the program. Our findings suggest that the positive effect of the incentives on their performance may more than offset the adverse effect of discouraging those who are *a priori* high-performing (in the absence of incentives) from joining the program. Our findings also suggest that when performance can be evaluated using administrative data and award ceremonies can be held during regular events that the organization runs, performance-contingent public-recognition award can be a cost-effective method to incentivize performance of those who self-select into the program. Our findings are thus informative for organizations, such as BRAC, which particularly care about the performance of volunteers and give non-financial awards that may bring career opportunities.

Our findings indicate that the net effect of public-recognition non-financial rewards on the performance of participating volunteers is in general *a priori* ambiguous, even if these rewards *seemingly* lead to an adverse selection effect on the pool of participating volunteers. Given that many organizations recognize the impacts and contributions of their high-performing volunteers in public ceremonies, our findings highlight an important tradeoff that these organizations should consider in giving out public-recognition rewards. Our results also imply that if volunteers are low-performing individuals, such as in the typical case of forced or mandatory volunteerism, performance-contingent public-recognition rewards may potentially improve their performance.

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Table 1: Sample size by treatment group

Treatment groups	Number of schools	Number of CBs	Number of students
Public-recognition treatment. (T1)	165	1398	1886
Private-recognition treatment (T2)	165	1384	1947
Participation-based treatment (T3)	165	1380	1897
Total	495	4162	5730

Table 2: Correlation between CB's characteristics and student performance (T3 group)

	(1)	(2)	(3)	(4)
	Math	English	Math	English
A. All correlates				
High past achievement	0.094	-0.001	0.170*	0.176*
	(0.076)	(0.076)	(0.100)	(0.102)
Age	0.002	0.010*	-0.000	-0.002
	(0.007)	(0.006)	(0.010)	(0.010)
Male (=1)	0.166**	-0.067	0.135	0.046
	(0.079)	(0.070)	(0.105)	(0.095)
Years of schooling	-0.037	-0.078**	0.044	0.040
	(0.035)	(0.031)	(0.044)	(0.045)
Private tuition experience	0.196**	0.082	-0.027	0.050
	(0.088)	(0.078)	(0.104)	(0.107)
Ave. student's PSC performance	0.117***	0.102**	0.326***	0.326***
	(0.043)	(0.042)	(0.071)	(0.062)
R-squared	0.029	0.018	0.044	0.047
B. Subset of correlates				
High past achievement	0.132	0.015	0.211**	0.215**
	(0.081)	(0.075)	(0.102)	(0.100)
Private tuition experience	0.172**	0.043	0.015	0.076
	(0.082)	(0.075)	(0.100)	(0.100)
R-squared	0.011	0.001	0.005	0.007
Observations	863	863	1238	1238

Notes: The sample includes only individuals in the participation certification group (T3). All specifications in panel A include a constant term, CB's age, CB's gender, CB's education, CB's prior private tutoring experience, and the average of students' PSC performance. All specifications in panel B include a constant term. Standard errors, clustered at the school level, are reported in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 3: The effects of treatments on the likelihood of dropping out of the program

	(1)	(2)	(3)	(4)
Public-recognition cert. (T1)	0.045**	0.092***	-0.003	0.091***
	(0.022)	(0.032)	(0.025)	(0.032)
Private-recognition. cert. (T2)	0.006	0.006	0.004	0.005
	(0.022)	(0.029)	(0.026)	(0.029)
T1 x Low type				-0.093***
				(0.036)
T2 x Low type				0.000
				(0.033)
Low type				0.026
				(0.024)
Observations	4162	2036	2126	4162
R^2	0.008	0.018	0.005	0.011
Sample	All CBs	High type	Low type	All CBs
Dropout rate in T3	0.204	0.193	0.214	0.204

Notes: All specifications are linear probability regression models that include a constant term, as well as CB's age, CB's gender, CB's education, CB's prior private tutoring experience, and the average of students' PSC performance as additional control variables. High type means CB has past academic achievement at or above the median; low type means CB has past academic achievement below the median. Standard errors, clustered at the school level, are reported in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 4: The effects of the treatments on students' academic performance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All Types	High Type	Low Type	All CBs	All Types	High Type	Low Type	All CBs
	---------- Mathematics ----------				---------- English ----------			
Standardized test								
Public-recog. cert. (T1)	0.144*	0.038	0.248**	0.039	0.161**	0.093	0.225***	0.093
	(0.087)	(0.099)	(0.107)	(0.099)	(0.067)	(0.083)	(0.082)	(0.082)
	[0.114]	[0.904]	[0.026]	[0.900]	[0.087]	[0.702]	[0.026]	[0.695]
Private-recog. cert. (T2)	0.033	0.067	0.002	0.067	0.035	0.034	0.034	0.033
	(0.079)	(0.093)	(0.095)	(0.093)	(0.072)	(0.089)	(0.087)	(0.089)
	[0.954]	[0.825]	[0.983]	[0.830]	[0.954]	[0.910]	[0.919]	[0.915]
T1 x Low type				0.207*				0.133
				(0.112)				(0.097)
				[0.170]				[0.448]
T2 x Low type				-0.064				0.004
				(0.102)				(0.100)
				[0.877]				[0.975]
Low type				-0.043				0.031
				(0.075)				(0.069)
				[0.800]				[0.800]
Observations	3024	1492	1532	3024	3024	1492	1532	3024
R^2	0.021	0.022	0.027	0.024	0.023	0.017	0.035	0.026
Public examination								
Public-recog. cert. (T1)	0.096	0.103	0.085	0.105	0.020	-0.010	0.042	-0.005
	(0.098)	(0.113)	(0.123)	(0.113)	(0.087)	(0.109)	(0.105)	(0.109)
	[0.272]	[0.702]	[0.429]	[0.695]	[0.629]	[0.904]	[0.429]	[0.900]
Private-recog. cert. (T2)	0.031	0.105	-0.033	0.108	0.072	0.046	0.095	0.050
	(0.101)	(0.120)	(0.114)	(0.120)	(0.090)	(0.112)	(0.103)	(0.112)
	[0.954]	[0.747]	[0.896]	[0.768]	[0.945]	[0.905]	[0.867]	[0.915]
T1 x Low type				-0.018				0.048
				(0.134)				(0.127)
				[0.992]				[0.507]
T2 x Low type				-0.141				0.047
				(0.123)				(0.119)
				[0.451]				[0.877]
Low type				-0.140				-0.144
				(0.093)				(0.092)
				[0.515]				[0.207]
Observations	4514	2203	2311	4514	4514	2203	2311	4514
R^2	0.044	0.048	0.040	0.048	0.045	0.050	0.044	0.047
Mean GPA in T3	2.320	2.399	2.243	2.320	2.216	2.331	2.194	2.261

Notes: All specifications include a constant term, as well as CB's age, CB's gender, CB's education, CB's prior private tutoring experience, and the average of students' PSC performance as additional control variables. High type means CB has past academic achievement at or above the median; low type means CB has past academic achievement below the median. Test scores in each standardized test are standardized with respect to the mean and standard deviation of the control group. Standard errors, clustered at the school level, are reported in parentheses. The family-wise-error-rate-adjusted p-values reported in brackets were estimated using the free step-down resampling approach of Westfall and Young (1993) and the sample of students who have both standardized test and public examination results available. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 5: The effects of treatments on the likelihood of dropping out of the program two months after treatment announcement

	(1) All CBs	(2) High Type	(3) Low Type	(4) All CBs
Public-recognition cert. (T1)	0.039**	0.059**	0.018	0.058**
	(0.018)	(0.027)	(0.021)	(0.027)
Private-recognition cert. (T2)	0.024	0.015	0.031	0.014
	(0.020)	(0.026)	(0.025)	(0.026)
T1 x Low type				-0.040
				(0.032)
T2 x Low type				0.018
				(0.031)
Low type				0.013
				(0.022)
Observations	4162	2036	2126	4162
R^2	0.006	0.010	0.005	0.007
Dropout rate in T3	0.159	0.155	0.164	0.159

Notes: All specifications are linear probability regression models that include a constant term, as well as CB's age, CB's gender, CB's education, CB's prior private tutoring experience, and the average of students' PSC performance as additional control variables. High type means CB has past academic achievement at or above the median; low type means CB has past academic achievement below the median. The outcome measure dropout is measured two months after treatment announcement. Standard errors, clustered at the school level, are reported in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 6: The effects of the treatments on students' standardized test performance – excluding students whose CBs dropped out

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All Types	High Type	Low Type	All CBs	All Types	High Type	Low Type	All CBs
	---------- Mathematics ----------				---------- English ----------			
Public-recog. cert. (T1)	0.099	-0.052	0.240**	-0.046	0.166*	0.047	0.269**	0.050
	(0.088)	(0.100)	(0.109)	(0.101)	(0.090)	(0.111)	(0.111)	(0.111)
	[0.266]	[0.808]	[0.029]	[0.844]	[0.172]	[0.808]	[0.029]	[0.844]
Private-recog. cert. (T2)	0.006	-0.021	0.034	-0.022	0.031	0.016	0.043	0.016
	(0.083)	(0.097)	(0.102)	(0.097)	(0.095)	(0.117)	(0.116)	(0.117)
	[0.937]	[0.970]	[0.903]	[0.971]	[0.937]	[0.970]	[0.903]	[0.971]
T1 x Low type				0.284**				0.178*
				(0.117)				(0.106)
				[0.021]				[0.100]
T2 x Low type				0.058				0.024
				(0.111)				(0.108)
				[0.828]				[0.828]
Low type				-0.101				0.009
				(0.078)				(0.075)
				[0.329]				[0.884]
Observations	2508	1236	1272	2508	2508	1236	1272	2508
R^2	0.019	0.026	0.023	0.022	0.021	0.015	0.033	0.023

Notes: All specifications include a constant term, as well as CB's age, CB's gender, CB's education, CB's prior private tutoring experience, and the average of students' PSC performance as additional control variables. High type means CB has past academic achievement at or above the median; low type means CB has past academic achievement below the median. Test scores in each standardized test are standardized with respect to the mean and standard deviation of the control group. Standard errors, clustered at the school level, are reported in parentheses. The family-wise-error-rate-adjusted p-values reported in brackets were estimated using the free step-down resampling approach of Westfall and Young (1993). * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 7: Tests for other explanations and interpretations

	(1)	(2)	(3)	(4)
	Dropout	Dropout	Standardized mathematics	Standardized English
Public-recognition certificate (T1)	0.096***	0.081**	0.285**	0.346***
	(0.035)	(0.035)	(0.129)	(0.121)
Private-recognition certificate (T2)	0.005	0.013	0.058	0.085
	(0.031)	(0.033)	(0.121)	(0.129)
T1 x Confident high type	-0.014			
	(0.053)			
T2 x Confident high type	0.003			
	(0.050)			
Confident	-0.005			
	(0.035)			
T1 x Top-end high type		0.024		
		(0.050)		
T2 x Top-end high type		-0.014		
		(0.047)		
Top-end high type		0.001		
		(0.034)		
T1 x CB experience not important for BRAC jobs			-0.083	-0.231
			(0.153)	(0.145)
T2 x CB experience not important for BRAC jobs			-0.041	-0.087
			(0.142)	(0.150)
CB experience not important for BRAC jobs			0.036	0.125
			(0.097)	(0.106)
Observations	2036	2036	1272	1272
R^2	0.018	0.018	0.023	0.035
Sample	High type	High type	Low type	Low type

Notes: All specifications are linear probability regression models that include a constant term, as well as CB's age, CB's gender, CB's education, CB's prior private tutoring experience, and the average of students' PSC performance as additional control variables. High type means CB has past academic achievement at or above the median. Confident high type takes the value of one if a high-achieving CB rated the reason that they joined the program was to improve their self-esteem below 7 on a 7-point Likert scale, and zero otherwise. Top-end high type takes the value of one if a high-achieving CB's past achievement is in the top quartile, and zero otherwise. CB experience not important for BRAC jobs takes the value of one if the CB did not strongly view that volunteering was important for finding employment with BRAC (i.e., rated 4, 5 or 6 on a 6-point Likert scale), and zero otherwise. Standard errors, clustered at the school level, are reported in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Figure 1: Timeline of the program and experiment

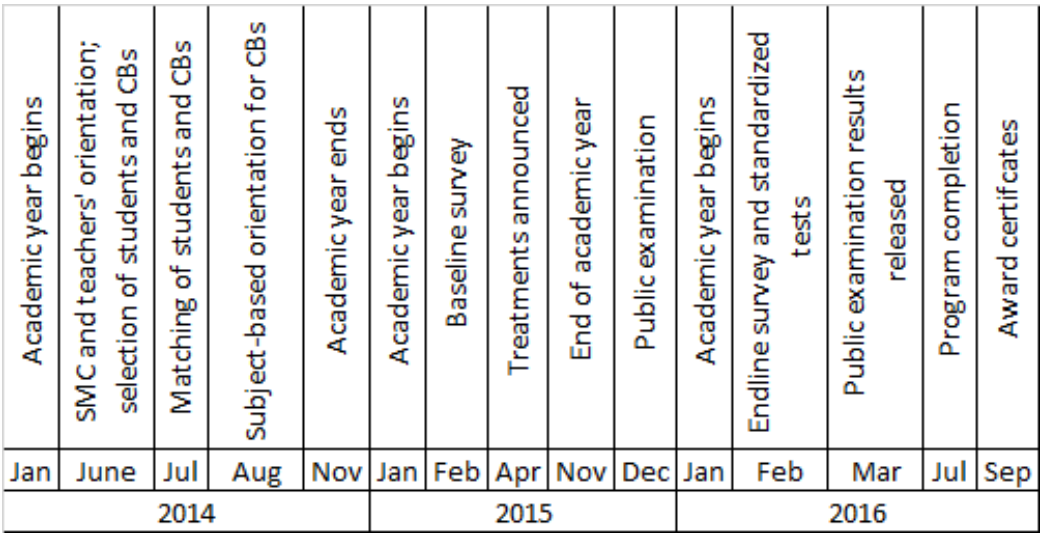


Figure 2: Dropout rates by treatment

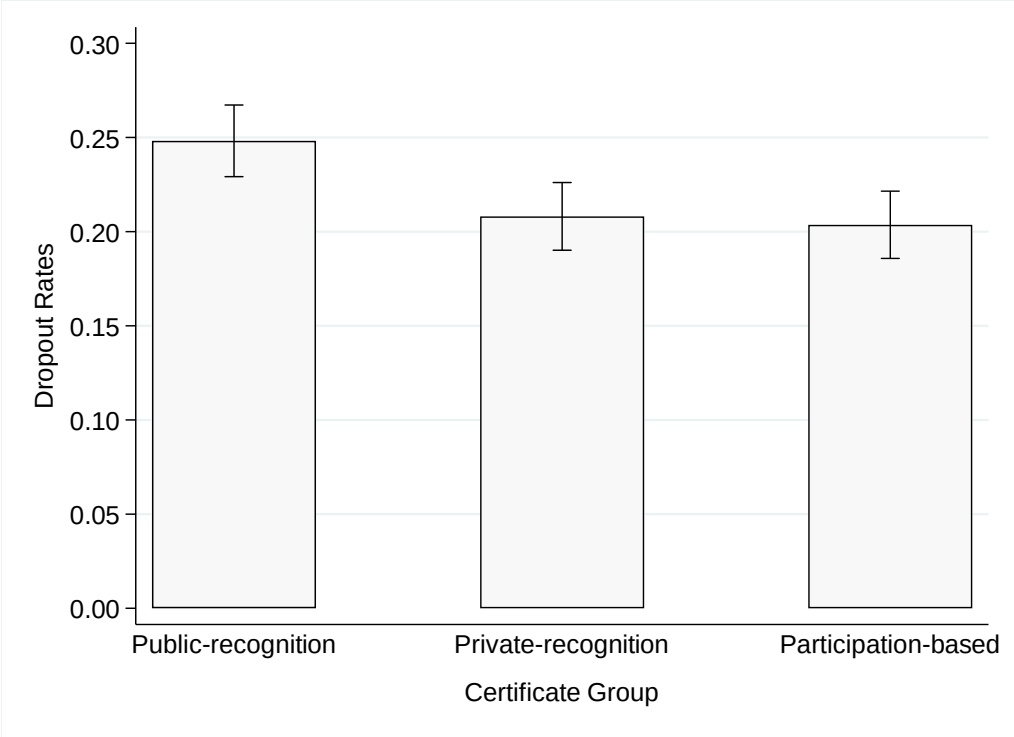


Figure 3: Dropout Rates by treatment and past academic achievement

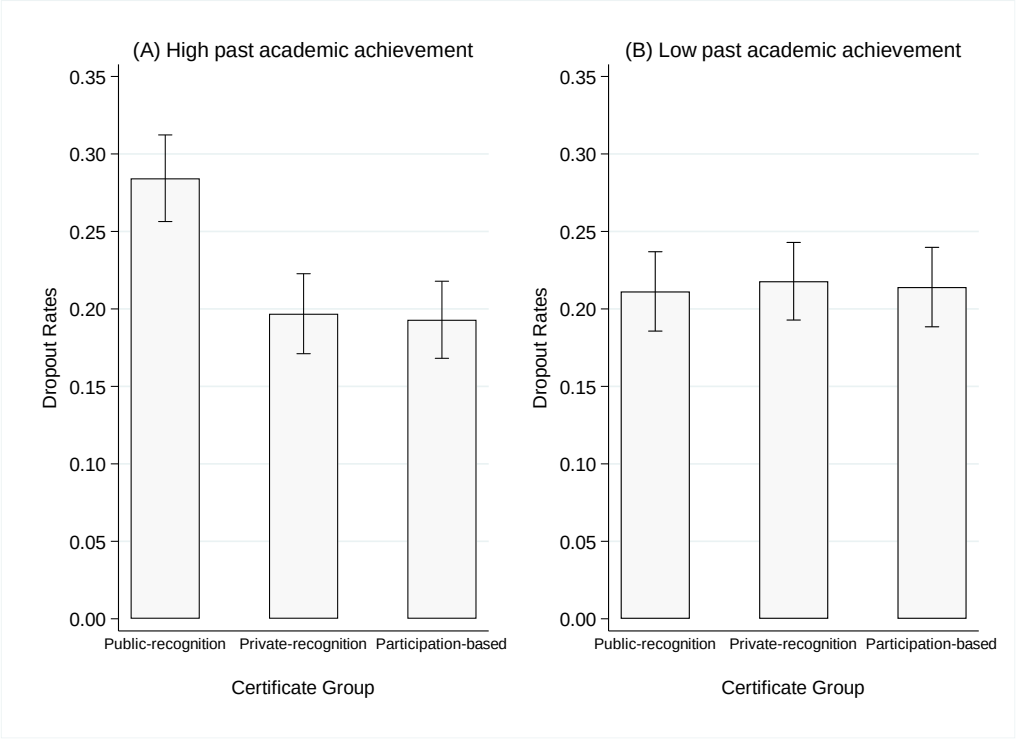
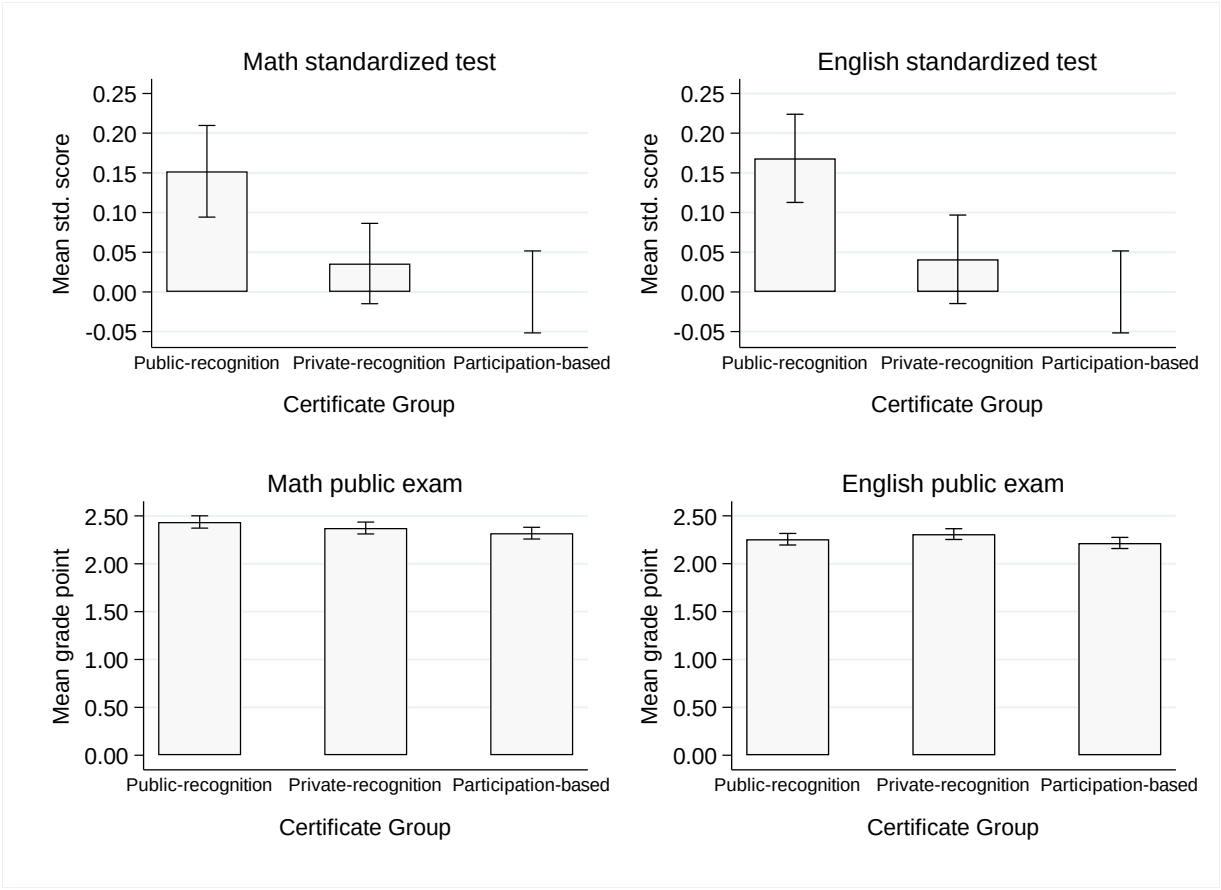


Figure 4: Student Performance by Treatment and Test



Online Appendices
Appendix A

Letter for Non-performance Treatment

Date:
Dear X,
School:

Welcome to the BRAC Chhatrabandhu program.
As a chhatrabandhu in our program, you volunteer time to provide free after-school tutoring as underprivileged students' "off school companions" by helping them comprehend and internalise difficult concepts and lessons of Mathematics and English. The support that you provide to these students will hopefully not only improve their performance in school and external public exams, such as Junior School Certificate (JSC) and Secondary School Certificate (SSC) examinations, but also raise their confidence to continue their education and motivate their parents to support their education.
By signing with us, you are committed to provide your service at the BRAC Chhatrabandhu Program.
Thank you very much for volunteering with BRAC Chhatrabandhu program. We look forward to working with you in helping underprivileged students in our community. We wish you best of luck as you embark on your new journey as a Chhatrabandhu with BRAC what we hope will be a very rewarding experience for you.

Certificates will be awarded!!!

You will be awarded with a certificate for your participation in the Chhatrabandhu program

With Thanks,

Letter for Performance Ceremony Treatment

Date:
Dear X,
School:

Welcome to the BRAC Chhatrabandhu program.
As a chhatrabandhu in our program, you volunteer time to provide free after-school tutoring as underprivileged students' "off school companions" by helping them comprehend and internalize difficult concepts and lessons of Mathematics and English. The support that you provide to these students will hopefully not only improve their performance in school and external public exams, such as Junior School Certificate (JSC) and Secondary School Certificate (SSC) examinations, but also raise their confidence to continue their education and motivate their parents to support their education.
By signing with us, you are committed to provide your service at the BRAC Chhatrabandhu Program. We are very pleased to announce that BRAC will **award a "superior certificate"** to you if your students achieve a high standard. S**uperior certificates will be awarded in a grand ceremony with BRAC high officials from its head office as chief guest**. Your performance will be evaluated every year on the basis of your students' performance.
Thank you very much for volunteering with BRAC Chhatrabandhu program. We look forward to working with you in helping underprivileged students in our community. We wish you best of luck as you embark on your new journey as a Chhatrabandhu with BRAC what we hope will be a very rewarding experience for you.

Excellent performers will be awarded superior certificates in a ceremony jointly organized by BRAC and Monash University of Australia in the presence of BRAC high officials!!!!

You will be considered as a "**superior**" performer if the following performance condition is met:
If any of your students achieves **an increase in average grade** between class 5 and the current class level exams of the subjects- Mathematics and English.
Example
Suppose you have a student named Sabina in class 7. Sabina's grade in the class 5 National Exam for Mathematics and English are 3 and 4 respectively. Thus, Sabina's average grade (for Math and English) in class 5 is 3.5. For you to be considered as a **superior performer**, Sabina's average grade for Mathematics and English in class 7's exams must be higher than 3.5. For example, if Sabina's grade for Mathematics is 3 and for English it is 4.2 in the class 7's exams, then you are a **superior performer** and you will be awarded with a **superior certificate** by BRAC high officials in a ceremony jointly organized by BRAC and Monash University of Australia.
Only superior certificate recipients will be awarded in a grand ceremony. If the above performance condition is not met, then you will just receive a normal certificate for your participation in the Chhatrabandhu program but not in the grand ceremony.
Please note that if your student is in class 7 in 2015, then his/her performance in class 7 school final exams will be used; if he/she is in class 8 in 2015, then his/her performance in the Junior School Certificate (JSC) exam in 2015 will be used for evaluation purpose.

With Thanks,

Letter for Performance without Ceremony Treatment

Date:
Dear X,
School:

Welcome to the BRAC Chhatrabandhu program.
As a chhatrabandhu in our program, you volunteer time to provide free after-school tutoring as underprivileged students' "off school companions" by helping them comprehend and internalise difficult concepts and lessons of Mathematics and English. The support that you provide to these students will hopefully not only improve their performance in school and external public exams, such as Junior School Certificate (JSC) and Secondary School Certificate (SSC) examinations, but also raise their confidence to continue their education and motivate their parents to support their education.
By signing with us, you are committed to provide your service at the BRAC Chhatrabandhu Program. We are very pleased to announce that BRAC will **award a "superior certificate"** to you if your students achieve a high standard. Your performance will be evaluated every year on the basis of your students' performance.
Thank you very much for volunteering with BRAC Chhatrabandhu program. We look forward to working with you in helping underprivileged students in our community. We wish you best of luck as you embark on your new journey as a Chhatrabandhu with BRAC what we hope will be a very rewarding experience for you.

Excellent performers will be awarded superior certificates!!!

You will be considered as a **"superior"** performer if the following performance condition is met:
If any of your students achieves **an increase in average grade** between class 5 and the current class level exams of the subjects- Mathematics and English.

Example

Suppose you have a student named Sabina in class 7. Sabina's grade in the class 5 National Exam for Mathematics and English are 3 and 4 respectively. Thus, Sabina's average grade (for Math and English) in class 5 is 3.5. For you to be considered as a **superior performer**, Sabina's average grade for Mathematics and English in class7's exams must be higher than 3.5. For example, if Sabina's grade for Mathematics is 3 and for English it is 4.2 in the class 7's exams, then you are a **superior performer** and you will be awarded with a **superior certificate.**

If the above performance condition is not met, then you will just receive a normal certificate for your participation in the Chhatrabandhu program.

Please note that if your student is in class 7 in 2015, then his/her performance in class 7 school final exams will be used; if he/she is in class 8 in 2015, then his/her performance in the Junior School Certificate (JSC) exam in 2015 will be used for evaluation purpose.

With Thanks,

Appendix B

Table B.1: Summary statistics by treatment and tests of balance

	T1	T2	T3	T3 – T1	T3 – T2	Joint-Diff
	Mean (std. err.)	Mean (std. err.)	Mean (std. err.)	Mean (std. err.)	Mean (std. err.)	F-Stat (p-value)
A. CB's characteristics						
Age	20.08	20.31	20.08	0.00	-0.23	0.36
	(0.16)	(0.17)	(0.16)	(0.30)	(0.31)	(0.70)
Male (=1)	0.44	0.45	0.44	0.00	-0.01	0.03
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.97)
Years of schooling	11.01	11.09	11.03	0.02	-0.06	0.42
	(0.04)	(0.04)	(0.04)	(0.08)	(0.08)	(0.65)
Private tuition experience	0.36	0.37	0.35	-0.01	-0.02	0.23
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.80)
Low past academic achievement (=1)	0.49	0.53	0.50	0.01	-0.03	1.21
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.30)
High baseline volunteering (=1)	0.31	0.36	0.34	0.02	-0.02	1.02
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.36)
Number of students tutored	1.35	1.41	1.37	0.03	-0.03	1.04
	(0.01)	(0.01)	(0.01)	(0.04)	(0.04)	(0.35)
Number of observations	1398	1384	1380			
B. Student's characteristics						
PSC mathematics grade	3.59	3.61	3.56	-0.03	-0.04	0.21
	(0.03)	(0.02)	(0.03)	(0.07)	(0.07)	(0.81)
PSC English grade	3.17	3.18	3.12	-0.04	-0.05	0.44
	(0.02)	(0.02)	(0.02)	(0.06)	(0.06)	(0.65)
Age	12.79	12.82	12.80	0.01	-0.02	0.16
	(0.02)	(0.02)	(0.02)	(0.05)	(0.05)	(0.85)
Male (=1)	0.40	0.40	0.40	0.00	0.00	0.02
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.98)
CB met family once per week (=1)	0.81	0.81	0.81	0.00	0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.99)
Poverty status (=1)	0.76	0.78	0.78	0.01	0.00	0.18
	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)	(0.83)
Number of observations	1886	1947	1897			

Notes: The total numbers of schools, CBs, and students by treatment group are reported in Table 1. The *F*-statistics reported in the last column test whether the characteristics in T1, T2, and T3 are jointly different from zero (standard errors clustered at the school level).

Table B.2: Summary statistics by treatment and tests of balance (standardized test sample)

	T1	T2	T3	T3 – T1	T3 – T2	Joint-Diff
	Mean	Mean	Mean	Mean	Mean	F-Stat
	(std. err.)	(std. err.)	(std. err.)	(std. err.)	(std. err.)	(p-value)
A. CB's characteristics						
Age	20.15	20.17	20.31	0.16	0.14	0.11
	(0.22)	(0.20)	(0.22)	(0.38)	(0.37)	(0.90)
Male (=1)	0.46	0.42	0.44	-0.02	0.02	0.52
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.59)
Years of schooling	11.03	11.05	11.08	0.05	0.03	0.11
	(0.05)	(0.05)	(0.05)	(0.10)	(0.10)	(0.90)
Private tuition experience	0.35	0.35	0.35	0.00	0.01	0.02
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.98)
Low past academic achievement (=1)	0.50	0.52	0.50	0.00	-0.02	0.18
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.84)
High baseline volunteering (=1)	0.31	0.33	0.34	0.03	0.01	0.51
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.60)
Number of students tutored	1.24	1.27	1.23	-0.01	-0.04	0.69
	(0.02)	(0.02)	(0.02)	(0.03)	(0.04)	(0.50)
B. Student's characteristics						
PSC mathematics grade	3.69	3.67	3.66	-0.03	0.00	0.07
	(0.03)	(0.03)	(0.03)	(0.07)	(0.07)	(0.93)
PSC English grade	3.25	3.26	3.19	-0.06	-0.07	0.71
	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)	(0.49)
Age	12.79	12.82	12.81	0.02	-0.01	0.18
	(0.02)	(0.02)	(0.02)	(0.05)	(0.05)	(0.83)
Male (=1)	0.42	0.35	0.39	-0.04	0.03	2.29
	(0.02)	(0.01)	(0.02)	(0.03)	(0.03)	(0.10)
CB met family once per week (=1)	0.82	0.81	0.81	-0.01	-0.01	0.03
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.97)
Poverty status (=1)	0.74	0.78	0.77	0.02	-0.01	0.87
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.42)
C. Standardized test						
Sample size of test takers	976	1,032	1,066			
Original sample size of students	1,886	1,947	1,897			
Proportion with std. test data	0.52	0.53	0.54	0.02	0.01	0.35
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.71)

Notes: The total numbers of schools, CBs, and students by treatment group are reported in Table 1. The *F*-statistics reported in the last column test whether the characteristics in T1, T2, and T3 are jointly different from zero (standard errors clustered at the school level).

Table B.3: Summary statistics by treatment and tests of balance (public/in-school examination sample)

	T1	T2	T3	T3 – T1	T3 – T2	Joint-Diff
	Mean	Mean	Mean	Mean	Mean	F-Stat
	(std. err.)	(std. err.)	(std. err.)	(std. err.)	(std. err.)	(p-value)
A. CB's characteristics						
Age	20.10	20.13	20.18	0.07	0.05	0.03
	(0.18)	(0.18)	(0.18)	(0.31)	(0.31)	(0.97)
Male (=1)	0.44	0.43	0.43	-0.01	0.00	0.10
	(0.02)	(0.01)	(0.01)	(0.03)	(0.03)	(0.91)
Years of schooling	11.02	11.06	11.06	0.04	0.00	0.18
	(0.04)	(0.04)	(0.04)	(0.08)	(0.09)	(0.84)
Private tuition experience	0.36	0.36	0.36	0.00	0.00	0.02
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.98)
Low past academic achievement (=1)	0.50	0.52	0.51	0.01	-0.02	0.34
	(0.02)	(0.01)	(0.02)	(0.03)	(0.03)	(0.71)
High baseline volunteering (=1)	0.32	0.36	0.32	0.01	-0.03	0.89
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.41)
Number of students tutored	1.33	1.39	1.38	0.05	-0.01	1.06
	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.35)
B. Student's characteristics						
PSC mathematics grade	3.64	3.65	3.60	-0.04	-0.05	0.27
	(0.03)	(0.03)	(0.03)	(0.07)	(0.06)	(0.76)
PSC English grade	3.21	3.21	3.15	-0.07	-0.06	0.76
	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)	(0.47)
Age	12.76	12.78	12.78	0.02	0.00	0.10
	(0.02)	(0.02)	(0.02)	(0.05)	(0.05)	(0.91)
Male (=1)	0.40	0.39	0.41	0.01	0.03	0.45
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.64)
CB met family once per week (=1)	0.82	0.82	0.80	-0.01	-0.02	0.17
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.85)
Poverty status (=1)	0.76	0.77	0.78	0.01	0.01	0.13
	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.87)
C. Public/in-school exam						
Sample size of examination data	1,451	1,550	1,513			
Original sample size of students	1,886	1,947	1,897			
Proportion with exam data	0.77	0.80	0.80	0.03	0.00	0.77
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.47)

Notes: The total numbers of schools, CBs, and students by treatment group are reported in Table 1. The *F*-statistics reported in the last column test whether the characteristics in T1, T2, and T3 are jointly different from zero (standard errors clustered at the school level).

Appendix C

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Certificate of Appreciation

Chhatrabandhu (Volunteering for Enhancing Learning Opportunity)
BRAC Education Programme

This award is presented to

Demonstrates sheer commitment as a social philanthropist who allocated time, labor and talent to help out number of underprivileged secondary school students with their school work from 2014 to 2015. A charge-free 'after school tuition' helps these underprivileged students do well in the classroom and school. BRAC wants to acknowledge and thank for this voluntary social work

Director
BRAC Education Programme

brac

Certificate of Excellence

Chhatrabandhu (Volunteering for Enhancing Learning Opportunity)
BRAC Education Programme

This award is presented to

For outstanding performance in teaching as a volunteer with BRAC Chhatrabandu Programme and success in improving the performance of his/her students in 2014-2015. S/he demonstrated sheer commitment as a social philanthropist who allocated time and gave effort to help unprivileged secondary students with their school works

Director
BRAC Education Programme

Notes: The above certificates are translated versions of the original Bengali certificates.

Appendix D

Table D.1: Perceptions and Beliefs of Parents, School Teachers and Administrators, and Volunteers

	Mean (std. err.)
A. Surveys of parents, school teachers, and school administrators	
Belief that prosocial preferences and valuation of performance-contingent certificate are positive correlated	0.889 (0.015)
Belief that prosocial preferences and valuation of performance-contingent public-recognition certificate are positive correlated	0.911 (0.014)
Belief that volunteers are sincerer and more genuine when they participate in a program that does not provide any material rewards†	0.706 (0.022)
Prefer to hire a tutor/teacher who has weak SSC performance but with a BRAC-issued superior certificate than a similar tutor/teacher without it	0.958 (0.010)
B. Survey of volunteer tutors	
Belief that prosocial preferences and valuation of performance-contingent certificate are positive correlated	0.927 (0.018)
Belief that prosocial preferences and valuation of performance-contingent public-recognition certificate are positive correlated	0.966 (0.013)
A tutor/teacher who has weak SSC performance but with a BRAC-issued superior certificate is more employable than a similar tutor/teacher without it	0.976 (0.011)
Performance-contingent superior certificate awarded publicly in a ceremony at BRAC's district office with networking opportunities is the most valuable	0.825 (0.027)
Performance-contingent superior certificate awarded privately is the second most valuable	0.752 (0.030)
Participation-based regular certificate given privately is the least valuable	0.908 (0.020)
A tutor with weak SSC performance is more likely than a tutor with strong SSC performance to pay a small fee to obtain a superior certificate issued by BRAC that indicates strong performance in improving students' test scores	0.684 (0.032)

Notes: The sample size for the survey of parents is 211. The sample size for the survey of school teachers and administrators is 214. The sample size for the survey of volunteer tutors is 206. None of the survey respondents were part of the actual intervention by BRAC's *Chhatrabandhu* program. † The question asks the respondent to "Rank the following individuals in terms of their sincerity (genuineness) in helping people. The person with the highest level of sincerity in helping people is ranked 1 and the person with the lowest level of sincerity in helping people is ranked 2" and the two individuals are: "A person who provides free tutoring services to students without getting any material rewards in return" and "A person who provides free tutoring services to students with the potential to get a certificate from BRAC. The certificate informs people about this person's work performance and the certificate can also be used for job seeking purpose.

Appendix E

In addition to examining beliefs of people, we also use characteristics of CBs to examine whether proxy measures of prosocial preference and reward preference are positive correlated. Given that these are intrinsic valuations and cannot be easily observed or reported, we infer them indirectly from the baseline data. Firstly, before the performance-contingent certificate and public ceremony were announced and offered, there was no non-financial rewards and publicity. The weekly hours spent volunteering as a CB at baseline provides a proxy for a volunteer's intrinsic valuation for volunteering (i.e., prosocial preference). For simplicity, we consider a CB as having strong prosocial preference or high private gains from volunteering when the CB tutored their students more than the median hours of tutoring time per week (6 hours) at baseline. Secondly, the superior certificate and public ceremony are more likely to benefit CBs who do not have a strong resume or track record. Compared to CBs who already have a strong resume, their job prospects are more likely to improve when they are rewarded the superior certificate in a public ceremony and have their strong teaching performance revealed to the community. It follows that a CB's private valuation of or reward preference for the public-recognition certificate can be proxied by their (low) past achievement. For simplicity, we consider a CB as having a high valuation of the non-financial rewards when the volunteer's own past achievement is below the median in the sample. The correlation between the proxy measure of prosocial preference and proxy measure of reward preference is positive (0.08) and statistically significant ($p<0.001$). Thus, proxy measures of prosocial preference and reward preference are non-negatively correlated, consistent with the data based on measures of beliefs.