

Can public recognition reward backfire? Field experimental evidence on the retention and performance of volunteers with social-image concerns^{*}

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Abstract

We embed a large-scale randomized controlled experiment within an existing volunteer tutor program of BRAC in Bangladesh to examine the effects of offering non-financial incentives on volunteers' dropout rates and performance. Consistent with the hypothesis that volunteers are motivated by social-image concerns, we find that dropout rates increase when volunteers, especially those with high other-regarding and career motives for volunteering, are offered a performance-contingent public-recognition certificate. Despite dropout rates almost double among volunteers the program sought after, the treatment improves overall student performance, as it motivates volunteers with low other-regarding motive for volunteering and low past achievement to perform.

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

JEL Codes: O15; I25; J24; H4

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1. Introduction

Volunteers play an important role in various economies. In many countries, between about a quarter and a half of the adult population volunteer their time without pay to help organizations to deliver services, such as education, health, and religious services, to individuals and communities.³ The value of their time accounts for about 2.2% of GDP in the U.S. (Lough, McBride, & Sherraden, 2007), 1.4% of GDP in Australia (ABS, 2015), and 1.7% of GDP in Bangladesh (BBS, 2011). The voluntary sector is also a major employer – for example, about 2.7% of the UK workforce is in the voluntary sector.⁴ However, volunteers tend not to stay long with the organizations for which they volunteer. For example, one third of volunteers who volunteered in 2005 did not continue to volunteer in 2006 in the United States (CNCS, 2007).⁵ Recognizing the benefits volunteers bring, governments and organizations understandably implement many initiatives to encourage volunteerism (Bussell & Forbes, 2002; Clary, Snyder & Ridge, 1992). An important issue for policy makers in governments and managers in organizations that utilize volunteers is to recruit and retain effective volunteers.

Conventional economic theories suggest that the use of incentives may help in recruiting and retaining the right workers, and may also improve their efforts (Lazear, 2000; Muralidharan & Sundararaman 2011; Dal Bó, Finan & Rossi, 2013), but behavioral economic theories suggest that the use of incentives, whether monetary or non-monetary, can have unintended consequences (Frey, 1994; Frey & Goette, 1999; Bénabou & Tirole 2003; Bénabou & Tirole, 2006). Compared to pay work, individuals' motives for volunteering may be very different. For example, individuals may volunteer because they derive satisfaction from warm-glow giving (impure altruism) and when people benefit from prosocial activities (pure altruism) (Andreoni, 1989; Andreoni, 1990). They may also volunteer due to career concerns, as their volunteering activities may serve as a signal to future employers or help them acquire human capital (Menchik and Weisbrod, 1987). They may also volunteer due to image concerns because they would like to be perceived as prosocial or public spirited (Bénabou & Tirole, 2006). These motivations may interact with incentives in a way that

³ For the United States, the volunteer rate was 24.9% in 2015 (BLS, 2015). In Australia, 31% of people aged 18 years and over participated in formal volunteering in 2014 (ABS, 2015). In England in 2014/15, 42% of adults aged 16 and over reported volunteering formally at least once in the previous year.

⁴ This compares with 25% of workers in the UK who work for public sector employers (source: <https://data.ncvo.org.uk/a/almanac12/how-big-is-the-voluntary-sector-compared-to-the-rest-of-the-economy/>).

⁵ The volunteer retention crisis has also been found to be acute in developing countries (Alam, Tasneem & Oliveras, 2011; Paradis & Usui, 1987).

creates an effect opposite to what the volunteer utilizing organization intends. For example, Bénabou and Tirole (2006) show theoretically that incentives may decrease prosocial activities of individuals who have concerns for social reputation because rewards cast doubt about their true motives for which good deeds are performed. Furthermore, since one of the main reasons for organizations to rely on volunteers is to keep their expenditures low, incentives considered need to be small; however, Gneezy and Rustichini (2000) show in a field experiment that the use of small monetary incentives leads to lower amount of donations collected by volunteers.

We embed a randomized controlled experiment in the *Chhatrabandhu* (CB) program of the non-government organization (NGO) BRAC in Bangladesh to examine whether using different types of non-financial incentive (NFI) schemes affect the retention of volunteer tutors and their students' performance. The CB program is a flagship program of BRAC. It recruits local volunteers to provide free after-school tutoring services in mathematics and English to selected secondary school students who are from poor or disadvantaged families. The experiment involves 4,162 volunteer tutors and more than 5,000 students in 495 schools across Bangladesh. Because the experiment is a part of an existing nationwide large-scale program that involves more than 40,000 volunteer tutors and 1,400 schools from 55 districts across Bangladesh, and the participants were unaware of the experiment, it occurred in a natural field setting (Harrison and List, 2004). Thus, the results from this study will likely to have external validity for this kind of volunteering activities, at least in the context of Bangladesh.

Bénabou and Tirole's (2006) paper motivates our experimental design and provides a set of tests for the hypothesis that volunteers are motivated by social-image concerns regarding their preferences for prosocial behaviors and material rewards. In the experiment, volunteer tutors are assigned randomly to one of three treatments 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. If the volunteer tutors do not meet this threshold requirement for a superior certificate, they instead receive a certificate of appreciation for their program participation ("regular certificate") in private. 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 volunteer for career reasons, while the ceremony informs the community the names

of volunteers with outstanding performance and publicizes their contribution. Thus, performing strongly will increase the visibility of their program participation and performance to members in the community, which in turn influences their social image. The second treatment group differs from the first only in terms of the way in which the certificates are awarded: they are given to the volunteers privately without a public ceremony, 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, and the existence of such a reward, unless the volunteers choose to reveal them. Lastly, there is a control group in which each volunteer receives a regular certificate upon completion of the program, as is the case for volunteers outside the experiment.

The experiment yields several novel findings that help us to understand the interplay between public-recognition rewards and volunteers' motivations, participating decisions and performance. First, we find that offering the performance-contingent public-recognition certificate leads to an increase in the dropout (attrition) rate of volunteer tutors by 21 percent, but that offering the performance-based private-recognition certificate does not. This result is consistent with Bénabou and Tirole's (2006) model prediction that treatment which exogenously increases the visibility of a person's prosocial activities and acceptance of rewards may reduce her participation if she is motivated by reputational concerns. Specifically, an image-concerned tutor's other-regarding motivation for volunteering is more likely to be misperceived to be her desire for fame or public recognition when the community knows that she has knowingly participated in a volunteer program that will publicize her outstanding performance and provide her with a material reward.

Second, our survey measures indicate that volunteer tutors with high other-regarding motives for volunteering also tend to have high career motives for volunteering, confirming the key condition in Bénabou and Tirole's (2006) model under which incentives may backfire. When we categorize volunteers into one of four motive types: high other-regarding and high career motives, high other-regarding and low career motives, low other-regarding and high career motives, and low other-regarding and low career motives, we find that the public-recognition reward increases the dropout rates of volunteers with high other-regarding motive and high career motive by approximately 42 percent, while it has no effect on the dropout rates of other types of volunteers. Third, we find that dropout rates nearly double among high-achieving volunteers who also have high other-regarding motive and career motive for volunteering, when they are offered the

performance-contingent public-recognition certificate. These results further confirm the prediction that incentives will most likely to backfire among volunteers whose preferences for prosocial activities are most at risks of being mistaken for their preferences for the public-recognition reward, and whose probability of being publicly recognized is greater.

Although the public-recognition reward backfires with regards to participation decisions of volunteers, we find that the treatment improves overall student performance. Specifically, students' performance in the standardized mathematics and English tests that we designed and that were administered by BRAC, improves significantly when their tutors are assigned into the public-recognition treatment group. Despite dropout rates increase among tutors with characteristics associated with strong student performance, the performance-contingent public-recognition certificate effectively incentivizes tutors with low past academic achievement and low other-regarding motives for volunteering to improve their students' performance. These results are also in line with Bénabou and Tirole's (2006) model prediction that volunteers who have low intrinsic motivation for prosocial activities and face high returns to rewards are expected to respond positively to incentives that increase the visibility of their participation and performance.

There are several alternative theories that may also generate some of our experimental findings. The first set of alternative theories hypothesizes that volunteers are motivated by reputational concerns unrelated to their prosocial preferences. For example, volunteers may prefer to be perceived as conscientious (and not greedy), or to be successful (and not greedy). They drop out of the public-recognition treatment group because the reward creates doubt about their conscientiousness or exposes them to potential failure. The second set of alternative theories hypothesizes that volunteers do not have any reputational concern at all. 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 career frame. Under the career frame, the performance-contingent certificate is of little value to volunteers, and hence increases their dropout rates. The data do not fully support these alternative interpretations.

Numerous empirical studies have examined the effects of incentives on participation or performance of individuals in various contexts.⁶ This paper is closely related to studies that focus

⁶ 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 Rya (2012), and Lavy (2002) on incentives for

on the effects of incentives on prosocial behaviors, the effects of non-financial effects on participation and performance, and the role of social-image concern. For example, Ariely, Bracha and Meier (2009) show in a laboratory experiment that monetary incentives are effective in incentivizing subjects to exert greater effort in a real-effort task that leads to increased charitable donations, when subjects' efforts are made in private, but not when their efforts are made in public. Ashraf, Bandiera and Lee (2018) 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 applicants who are eventually hired as nurses. Similarly, Ashraf, Bandiera and Jack (2014) find that non-financial awards (e.g., star treatment) are more effective than financial rewards to incentivize agents selling condoms. Research also suggests that social image plays an important role for the effectiveness of monetary incentives on prosocial activities. For example, using observational data, Carpenter and Myers (2010) find that the positive effect of monetary incentives on volunteer firefighters' time spent volunteering declines with survey measure of their concern for social reputation. However, less is known about whether providing public-recognition rewards may have effects on *both* the participation *and/or* performance of volunteers opposite to what intended. And if so, are these effects most consistent with the hypothesis that individuals have reputational concerns about their preferences for prosocial activities and material rewards?

To the best of our knowledge, this is the first paper that uses a natural field experiment that is embedded in an existing volunteer program to demonstrate that: (i) using a public-recognition reward to incentivize volunteers can backfire on the retention of volunteers, especially among those after whom volunteer utilizing organizations presumably most seek; (ii) revealed-preference behaviors of volunteers are most consistent with the hypothesis that they are concerned about the perceptions of other people regarding their preferences for prosocial activities and material rewards; and (iii) despite the seemingly adverse selection effect of the performance-contingent public-recognition reward on retention, the reward effectively incentivizes image-concerned volunteers who are low-achieving and have low other-regarding motive to perform, leading to an overall improvement in student outcomes. Thus, our experiment demonstrates that although offering public-recognition rewards to volunteers may lead to an under-representation of volunteers

teachers; Lazear (2000) and Gneezy and List (2006) on incentives for workers; and Leuven, Oosterbeek and Klaauw (2010) on incentives for students.

with characteristics associated with effective and quality performance, it may still effectively incentivize those self-select into the program to perform.

2. Theoretical Framework

We draw heavily from Bénabou and Tirole's (2006) model to gain insights into the effects of using different types of performance-contingent non-financial rewards on volunteers' activity and performance in the context of our field experiment. The model informs the design of the experiment, the hypotheses to be tested, the econometric analysis, and the interpretations of the findings.

An individual's decision problem is to select a level of voluntary tutoring activity $a \in A$, where $A \subset \mathbb{R}$. The person has other-regarding preferences and an intrinsic valuation for volunteering activities, v_a . The person's v_a is high when she derives satisfaction from the act of tutoring underprivileged students for free (i.e., impure altruism or warm glow giving in Andreoni (1989)). This person has an intrinsic valuation for non-financial rewards, v_y , and may receive an exogenously determined non-financial reward y for the voluntary tutoring activity a . The person's v_y is high when her career motive for volunteering is high (i.e., she volunteers to improve her labor market outcomes). In the context of our experiment, the non-financial reward takes the form of a performance-contingent certificate which can be used as a signal of this person's ability or productivity in the labor market. Engaging in the voluntary tutoring activity a entails a utility cost of $C(a)$. Thus, participation at level a of voluntary tutoring activity yields a direct benefit:

$$(v_a + v_y y)a - C(a) \quad (1)$$

The realization of each individual's preference type $\mathbf{v} \equiv (v_a, v_y) \in \mathbb{R}^2$ is private information known to the person but not observable by others.

The person's decision to participate in voluntary activities may carry reputational costs and benefits. If the person cares about her reputation or image in the community, then the reputational payoff from choosing a , given the non-financial reward y , is

$$R(a, y) \equiv x[\gamma_a E(v_a | a, y) - \gamma_y E(v_y | a, y)] \quad (2)$$

The factor $x > 0$ measures the visibility or salience of the person's voluntary activity. The greater is x , the greater is the likelihood the person's voluntary activity is observed by others, the larger the number of people who hear about it, and so on. The assumptions that $\gamma_a \geq 0$ and $\gamma_y \geq 0$ reflect the idea that people would like to appear as having other-regarding (prosocial or altruistic) preferences and not motivated by fame and material rewards (disinterested). A person without these social-image concerns will have $\gamma_a = 0$ and $\gamma_y = 0$. $E(v_a|a, y)$ is the beliefs (posterior expectations) of others about the person's intrinsic valuation for prosocial activities, whereas $E(v_y|a, y)$ is the beliefs of others about the person's intrinsic valuation for non-financial rewards.

Defining $\mu_a \equiv x\gamma_a$ and $\mu_y \equiv x\gamma_y$, an individual with preferences $\mathbf{v} \equiv (v_a, v_y)$ and reputational concerns solves:

$$\max_{a \in A} \{(v_a + v_y y)a - C(a) + \mu_a E(v_a|a, y) - \mu_y E(v_y|a, y)\} \quad (3)$$

Following Bénabou and Tirole (2006), we impose a few more assumptions. First, we assume that everyone has the same reputational concerns $\boldsymbol{\mu} \equiv (\bar{\mu}_a, \bar{\mu}_y)$. Second, actions vary continuously over $A = \mathbb{R}$, with cost $C(a) = ka^2/2$. Third, $\mathbf{v} \equiv (v_a, v_y)$ are distributed in the population as

$$\begin{pmatrix} v_a \\ v_y \end{pmatrix} \sim \mathcal{N} \left(\begin{pmatrix} \bar{v}_a \\ \bar{v}_y \end{pmatrix}, \begin{bmatrix} \sigma_a^2 & \sigma_{ay} \\ \sigma_{ay} & \sigma_y^2 \end{bmatrix} \right), \quad (4)$$

By (3), the first-order condition for the choice of a of an individual with type $(\mathbf{v}, \boldsymbol{\mu})$ who faces non-financial reward y equates

$$ka = v_a + v_y y + r(a, y; \boldsymbol{\mu}), \quad (5)$$

Under the fixed $\boldsymbol{\mu}$ assumption, $r(a, y; \boldsymbol{\mu})$, which captures the person's (marginal) reputational return from contributing at level a becomes:

$$\bar{r}(a, y) \equiv \bar{\mu}_a \frac{\partial E(v_a|a, y)}{\partial a} - \bar{\mu}_y \frac{\partial E(v_y|a, y)}{\partial a}. \quad (6)$$

Given that \mathbf{v} is normally distributed, by the first-order condition (5), one can derive the conditional expectation terms:

$$E(v_a|a, y) = E(v_a|v_a + v_y y) = \bar{v}_a + \rho(y) \cdot [ka - \bar{v}_a - \bar{v}_y y - \bar{r}(a, y)], \quad (7)$$

$$E(v_y|a, y) = E(v_y|v_a + v_y y) = \bar{v}_y + \chi(y) \cdot [ka - \bar{v}_a - \bar{v}_y y - \bar{r}(a, y)], \quad (8)$$

where

$$\rho(y) \equiv \frac{\text{cov}(v_a, v_a + v_y y)}{\text{var}(v_a + v_y y)} = \frac{\sigma_a^2 + y\sigma_{ay}}{\sigma_a^2 + 2y\sigma_{ay} + y^2\sigma_y^2} \quad (9)$$

$$\chi(y) \equiv \frac{\text{cov}(v_y, v_a + v_y y)}{\text{var}(v_a + v_y y)} = \frac{y\sigma_y^2 + \sigma_{ay}}{\sigma_a^2 + 2y\sigma_{ay} + y^2\sigma_y^2} = \frac{1 - \rho(y)}{y} \quad (10)$$

Substituting (6) into (7) and (8) shows an equilibrium corresponds to a pair of functions $E(v_a|a, y)$ and $E(v_y|a, y)$ which solve a system of two linear differential equations. The solution yields the optimal a for an individual:

$$a = \frac{v_a + v_y y}{k} + \bar{\mu}_a \rho(y) - \bar{\mu}_y \chi(y), \quad (11)$$

Given (11), the optimal level of a for the average volunteer is:

$$\bar{a}(y) = \frac{\bar{v}_a + \bar{v}_y y}{k} + \bar{\mu}_a \rho(y) - \bar{\mu}_y \chi(y) \quad (12)$$

2.1 The effect of a performance-contingent certificate on participation

In our experiment, one of the non-financial incentive treatment schemes involves the award of a performance-contingent superior certificate when a volunteer's student performance meets a certain performance threshold and the award of a regular participation certificate when the volunteer's student performance does not meet the performance threshold. Comparing to the control group in which all volunteers receive a regular participation certificate regardless of their

student performance, the incentive scheme involving a performance-contingent superior certificate acts as an increase in y .

By (12) and all assumptions specified above, we have

$$\bar{a}'(y) = \frac{\bar{v}_y}{k} + \bar{\mu}_a \rho'(y) - \bar{\mu}_y \chi'(y) \quad (13)$$

Because $\frac{\bar{v}_y}{k} > 0$, $\bar{\mu}_a \geq 0$, and $\bar{\mu}_y \geq 0$, the response of the average optimal a to changes in y depends on the sign of $\rho'(y)$ and $-\chi'(y)$:

$$\rho'(y) = -\frac{(\sigma_{ay}\sigma_a^2 + y^2\sigma_{ay}\sigma_y^2 + 2\sigma_a^2y\sigma_y^2)}{(\sigma_a^2 + 2y\sigma_{ay} + y^2\sigma_y^2)^2} \quad (14)$$

$$-\chi'(y) = \frac{1}{y^2} - \frac{\rho(y)}{y^2} + \frac{\rho'(y)}{y} \quad (15)$$

When the covariance between other-regarding and career motives for volunteering $\sigma_{ay} \geq 0$, the effect of incentivizing volunteers with a performance-contingent certificate is a priori ambiguous because $\frac{\bar{v}_y}{k} > 0$, $\rho'(y) < 0$ and $-\chi'(y) \leq 0$. Nonetheless, the greater is the value of the performance-contingent certificate y and the extent that $\sigma_{ay} > 0$, the more likely that $\bar{a}'(y) < 0$. For a given change in y , if $\bar{a}'(y) < 0$, then the condition $\sigma_{ay} \geq 0$ must hold. It is also important to note that even when $\bar{a}'(y) < 0$, some volunteers may increase the optimal a .

2.2 The effect of a performance-contingent certificate rewarded in a public ceremony on participation

Another non-financial incentive treatment scheme in our experiment involves the award of a performance-contingent superior certificate in a public ceremony when a volunteer's student performance meets a certain performance threshold. When the volunteer's student performance does not meet the performance threshold, she is awarded a regular participation certificate in private. Thus, in addition to an increase in y , this non-financial incentive scheme also increases the visibility factor x . Let all the reputational weights μ be scaled up by some prominence factor, x . The optimal level of a for the average volunteer is then:

$$\bar{a}(y, x) = \frac{\bar{v}_a + \bar{v}_y y}{k} + x(\bar{\mu}_a \rho(y) - \bar{\mu}_y \chi(y)) \quad (16)$$

The performance-contingent certificate to be rewarded in a public ceremony increases both y and x . Note that the increase in y is also likely to be larger than the case when the performance-contingent certificate is rewarded privately because the public ceremony may provide networking opportunities. Similar to the effect of incentivizing volunteers with a performance-contingent certificate that has no impact on the visibility factor x , the effect of incentivizing volunteers with a performance-contingent certificate to be awarded in a public ceremony is also a priori ambiguous. Nonetheless, similar to the previous case, if $\sigma_{ay} \geq 0$ and y is large, especially if volunteers are generally most concerned about not appearing greedy or fame seeking ($\bar{\mu}_y \gg \bar{\mu}_a$), then the increase in x will further amplify the negative effect of an increase in y on $\bar{a}(y, x)$. Thus, if it is the case that $\sigma_{ay} \geq 0$, participation rates will likely to fall by more when volunteers are incentivized with a performance-contingent certificate to be awarded in a public ceremony than with a performance-contingent certificate to be awarded privately.

2.3 The effects of performance-contingent private-recognition certificate and performance-contingent public-recognition certificate on student performance

Although it is likely that $\bar{a}'(x, y) < 0$ when $\sigma_{ay} \geq 0$ and y is large, how the fall in \bar{a} in turn influences average student performance \bar{p} is a priori ambiguous. Assume a simple standard education production function, where a student's performance is increasing in the optimal amount of prosocial activity a an individual volunteer chooses:

$$p = g(a), \quad (17)$$

where $g'(a) > 0$, $g''(a) < 0$.

The performance of all students on average is:

$$\bar{p} = \int \int g(a) f(v_a, v_y) dv_a dv_y, \quad (18)$$

where $f(v_a, v_y)$ is the joint normal density function

By (17) and (18), it is clear that $\bar{p} \neq g(\bar{a})$. In particular, if $\bar{a}(y)$ decreases while a sizable number of volunteers increases their optimal level of a in response to changes in y and/or x from a relative low level of a , the average student performance \bar{p} may actually increase (given that $g''(a) < 0$).

3. Institutional Background

3.1 The Context

This study focuses on volunteers who provide after-school tutoring and mentoring services to poor children living in rural Bangladesh. Bangladesh has been remarkably successful in improving access to primary education. For example, in 2015, the net primary school enrolment rate was 98%. However, a large number of students do not continue into secondary education in Bangladesh, and most of those who do, drop out early. In 2015, the dropout rate for secondary education was 40.3%, with 19% of the dropouts leaving school in grade eight alone (BANBEIS, 2015).

Past studies suggest that the provision of remedial education or after-school tutoring can help improve students' educational outcomes (e.g., Banerjee et al., 2007; Carr & Wang, 2018). 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 and guardians are often not literate enough to offer any help with school work and not rich enough to afford private after-school tutoring (Islam, 2018). Thus, by utilizing the volunteer time of educated local people, BRAC initiated the *Chhatrabandhu* Program to improve the educational outcomes of disadvantaged secondary school students in rural Bangladesh through the provision of free after-school tutoring services.

3.2 BRAC's *Chhatrabandhu* (CB) Program

BRAC introduced the CB Program in 2007 with the primary objective of improving the educational outcomes of disadvantaged secondary school students in rural Bangladesh. Working with local 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).⁷ According to BRAC, these volunteer tutors are revered as "social

⁷ 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.

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 grade 10 public national examination—known as the secondary school certificate (SSC) examination), and are currently studying, working part-time, or unemployed. Most have had some experience of tutoring or teaching children in their own villages. As CBs, they provide free private tutoring to poor and disadvantaged students in mathematics and English. 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)⁸, and reduce dropouts from secondary schools in rural areas. On average a CB meets with her 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 1400 schools in 151 sub-districts of Bangladesh. More than 40,000 volunteers were involved in the program throughout the country.

The CB program is implemented in four stages. Stage 1 involves the school managing committee (SMC) and teachers’ orientation meeting. After identifying the schools where the CB program can be implemented, BRAC organizes an orientation meeting in the participating schools.⁹ The primary objective of the orientation meeting is to ensure that the SMC and school teachers are aware of the CB program. Parents, guardians, and elected representatives may also attend the meeting. At the meeting, BRAC staff explain the CB program, and encourage participants to disseminate the information about the program to help identify potential students as well as attracting volunteer tutors. The target volunteer population consists primarily of educated local individuals, particularly youths who are studying at college or have completed their high school studies.

In stage 2, students are selected. With the help of school teachers, guardians and SMC members, BRAC local program staff prepare a list of potential students who are currently enrolled

⁸ 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 for determining admission to the next level at secondary and higher secondary level schools.

⁹ 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.

in grade 6 or 7 for CB assignment. Program staff then survey or interview the parents of each student on the list to identify their socio-economic status. Students from low-income households are given priority.

In stage 3, CBs are selected and matched with students. Anyone who expresses an interest in participating in the program and meets the minimum education qualification requirement of having the SSC is recruited as a CB. Thus, CBs may include high school graduates, current college students, college graduates, housewives, and 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.

In stage 4, the CBs receive training and start the program. BRAC provides six days of intensive training to familiarize them with the standard curricula and learning materials. Retired or best 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 supports from BRAC program staff.

4. Experimental Design

We embed a randomized controlled field experiment within BRAC's existing CB program in order to test the effects of non-financial incentives on the volunteers' dropout decisions and performance. In April 2014, we selected 495 non-government secondary schools from a list of schools where BRAC was planning to initiate the CB program during that time. The selected schools are located in 49 districts (78 sub-districts) in which BRAC has the local resources to implement the field experiment.¹⁰ From these 495 schools, our experiment included 4,162 CBs, who were matched with 5,730 grade 6 or 7 students from disadvantaged families between June and August of 2014.

We conducted a baseline survey on these CBs during January and February of 2015. The survey collects information about the CBs' demographic, social, and economic characteristics, past

¹⁰ There are a total of 64 districts in Bangladesh. The CB schools included in this study are spread all over Bangladesh.

academic achievement, as well as motivations for joining the program. The survey also collects information about their students, such as the students' performance in the grade 5 national public exam, socio-economic status, and relationship with the CB.

We then assigned each of the 495 schools randomly to one of three treatment groups. The three treatment groups are: (T1) the performance-contingent public-recognition award group; (T2) the performance-contingent private-recognition award group; and (T3) the participation-based certificate group. Table 1 presents the numbers of schools, 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. 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 is near zero.¹¹

[Table 1]

In the performance-contingent public-recognition award group (T1), each CB received either a “superior” certificate (certificate of excellence) in a public ceremony organized by BRAC, or a “regular” certificate (certificate of participation) in private, depending 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 and members of the local community 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

¹¹ Schools in our treatment and control groups are even further located from each other as we did not consider all the schools from an area for the intervention. Most schools are at least 10 kilometres away from another school selected for this study.

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.

sure that they understood the performance criteria and how the two types of certificates would be awarded.

In the performance-contingent private-recognition award group (T2), the CBs also received a superior certificate 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 is that in T2 no public ceremony would take place for awarding the performance-contingent superior certificates. It is also important to note that the public-recognition treatment does not only influence the visibility factor x described in section 2, but also the value of the reward y as the public ceremony provides networking opportunities.

In the participation-based certificate group (T3), CBs received 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 was given to the CBs who failed to meet the performance requirement in the other two treatment groups.¹³

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

5. Data

5.1 Characteristics of CBs and Students and Verification of Randomization

This section reports the summary statistics of the CBs and students by treatment, and provides 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,

¹³ See Appendix D for translated versions of the certificates.

past academic achievement, other-regarding motive for volunteering, and career motive for volunteering.

Testing Bénabou and Tirole's (2006) model requires measures of other-regarding (prosocial or altruistic) motive for volunteering (v_a) and career motive for volunteering (v_y). In the baseline survey, CBs were asked 30 seven-point Likert scale questions regarding the importance of various reasons for joining the CB program as a volunteer. We use three questions to help us measure a CB's other-regarding motive for volunteering. These questions ask the CB to rate: (1) how much they are concerned about those who are less fortunate than themselves; (2) how much they are concerned about the group of students they are serving; and (3) how much they feel compassion towards people who are in need.¹⁴ CBs with total scores greater than the mean of 18 (out of 21) are considered to have high other-regarding (high-O) motive. Roughly two-thirds (64%) of CBs in the sample fall into this high other-regarding motive category. Similarly, we use another three questions to help us measure a CB's career motive for volunteering. These questions ask the CB to rate: (1) how important they think volunteering as a CB can help them get their foot in the door at a place where they would like to work; (2) how important they think volunteering as a CB enables them to make new contacts helpful for their career; and (3) how relevant volunteering experience as a CB will look good on their résumé.¹⁵ CBs with total scores greater than the mean of 18 (out of 21) are considered to have high career (high-C) motive. 63% of CBs in the sample fall in this high career motive category. It is important to note that because we focus on volunteers who do not have a full-time job, most respondents rated their other-regarding motive and career motive highly. With these two measures of other-regarding motive and career motive for volunteering, we categorize four types of volunteers: (1) high-O and high-C type; (2) high-O and low-C type; (3) low-O and high-C type; and (4) low-O and low-C type. We also assess the robustness of our main findings using alternative definitions of other-regarding and career motive in a robustness section.

Table 2 reports the means of the CBs' and students' characteristics by treatment, and demonstrates that these characteristics are balanced across treatments. The p -values for both the joint tests of differences and the differences between T1 and T3 (control), and T2 and T3 (control)

¹⁴ The three questions are: (1) "I am concerned about those less fortunate than myself"; (2) "I am genuinely concerned about the particular group I am serving"; and (3) "I feel compassion toward people who are in need".

¹⁵ The three questions are: (1) "Volunteering can help me get my foot in the door at a place where I would like to work; (2) "I can make new contacts that might help my business/career; and (3) "Volunteering experience will look good on my résumé".

are all above 0.10. Briefly, the CBs are on average 20 years old, majority females (56%), 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%), and majority poor (~80%), as reported by the CBs. Roughly 80% of CBs meet with the students' families on a weekly basis.

[Table 2]

5.2 Key Outcome Measures

We focus broadly on three main outcome variables: (1) whether the CB drops out of the program before its completion; (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 active when they were informed about the treatment in April 2015 (roughly eight months after commencing the program). However, by the time of the end-line survey in February 2016 (approximately 1.5 years after commencing the program), approximately 21% of the CBs had already dropped out of the program. By focusing on dropout rates, we essentially use retention to proxy the theoretical concept of optimal prosocial activity a . Dropping out means lower optimal prosocial activity a . 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.

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 also concerns about using average grade points from the grade 8 JSC examinations, which have been marred by allegations of question leaks and the lack of variation in grade points. We designed the standardized tests based on materials drawn from the relevant

textbooks.¹⁶ Separate tests were conducted for students in grades seven and eight. Program staff administered the tests in the classrooms at the schools.¹⁷

We randomly selected one student to sit the standardized tests for each CB (note that some CBs have two students). 3024 students participated in the tests; among them, 495 were tutored by CBs who dropped out of the program. The main reasons for such test-day absenteeism include students who could not be traced, students who were on leave, and students who had dropped out or moved elsewhere.¹⁸ We check whether the participation rates in the standardized test sample are similar across treatments and whether the characteristics of the CBs and the test-taking students are balanced across treatments (Table C.1 in Appendix C). The results show that the participation rates in the standardized tests, as well as the characteristics of test-taking students and their CBs are similar across treatments. The results imply that non-random sample selection is not a concern. We find that the students answered an average of 3.6 questions correctly out of the seven math questions (53%), and 2.8 questions out of the five English questions (56%).

6. Results

6.1 Dropout decision on average and by volunteering motive type

We examine the treatment effects on the likelihood of CBs dropping out of the program. We first show graphically how the dropout rates differ across the three treatment groups before we test for treatment differences using regressions that also control for characteristics of CBs and their students to increase the precision of estimates.

[Figure 1]

Figure 1 shows the average effect of the treatment on the likelihood of CB dropping out of the program by treatment group. Overall, the performance-contingent public-recognition certificate

¹⁶ The test items consist of multiple choice questions with four to five response options. The tests 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.

¹⁷ 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.

¹⁸ One student per CB (total 4162) was randomly selected. Of them 73% (3024) participated in the test. The test-day absenteeism rate of 27% is not unusual in the rural setting of a developing country. For example, approximately 20% of children were absent on test days in the case of Balsakhi Program in India administered by Pratham (see Banerjee et al., 2007) and the study on tracking of students in Kenya by Duflo et al. (2011).

treatment (T1) leads to higher dropout rates (0.04 percentage points) than either the performance-contingent private-recognition certificate treatment (T2) or the participation-based control group (T3). The 90% confidence interval for T1 does not overlap with the 90% confidence intervals for T2 and T3. The dropout rates of CBs do not differ much between T2 and T3, as their 90% 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. The incentive backfire result for T1 is consistent with the prediction that as we exogenously increase the visibility of and reward for volunteering, volunteers motivated by social-image concerns may drop out of the program if their other-regarding motive and career motive for volunteering are positively correlated and the reward is sufficiently large.

The theoretical prediction of an incentive backfire or crowding-out effect on volunteering activity crucially rests on the condition that other-regarding motive and career motive for volunteering are positively correlated. Table 3 cross tabulates volunteers according to these two types of volunteering motive and also reports the correlation between other-regarding motive and career motive for volunteering. The majority of volunteers (66.9 percent) are either with low other-regarding motive and career motive (20.3 percent) or with high other-regarding motive and career motive (46.6 percent). The correlation between these two motive types is 0.29 and statistically significant at the 1% level. Thus, the condition under which the incentive backfire effect documented in Figure 1 would occur holds up empirically.

[Table 3]

Given that other-regarding motive and career motive for volunteering are positively correlated in the data, we would also expect the positive effect of the performance-contingent public-recognition certificate treatment (T1) on dropout rates to be much greater for volunteers who are most motivated by other-regarding reason (high-O) and career concern (high-C) than for volunteers who are least motivated by other-regarding reason (low-O) and career concern (low-C). Figure 2 shows that this prediction seems to bear out in the data. The difference in dropout rates between the performance-contingent public-recognition certificate treatment (T1) and the participation-based certificate treatment (T3) is statistically significant at the 10% level for high-O

and high-C type volunteers as shown in panel A, but not statistically significant at the 10% level for low-O and low-C type volunteers as shown in panel D. Figure 2 also shows that the dropout rate (0.25) in the performance-contingent public-recognition certificate treatment (T3) group is 9 percentage-point higher than the dropout rate (0.16) in the performance-contingent private-recognition certificate treatment (T2) group for high-O and low-C type volunteers. This difference is also consistent with the model prediction for individuals whose (labor market) returns to the performance-contingent certificate are low and whose valuation for prosocial behavior is high, the reputational concern of looking greedy takes over when the certificate is to be awarded in public.

[Figure 2]

Table 4 reports regression results that confirm the patterns shown in Figures 1 and 2. The estimates in Column 1 indicate that the performance-contingent public-recognition certificate treatment (T1) significantly increases dropout rates from 0.196 to 0.238, representing a 21% increase. On the other hand, the performance-contingent private-recognition certificate treatment (T2) does not have much of an effect on dropout rates. Columns 2 to 5 report estimates for the four types of CBs according to their volunteering motives. Similar to the results shown in panel A in Figure 2, column 2 in Table 4 shows that the effect of the performance-contingent public-recognition certificate (T1) treatment on the dropout rates of high-O and high-C motive-type CBs is 0.075 and significantly different from zero at the 1% level. This increase in dropout rates represents a 42-percent increase in dropout rates of CBs in the participation-based certificate treatment group. Column 2 also shows that the performance-contingent private-recognition certificate treatment (T2) does not have much of an effect on the dropout rates of high-O and high-C motive-type CBs. Similar to the results in panels B to D in Figure 2, columns 3 to 5 show that neither the performance-contingent public-recognition certificate (T1) treatment nor the performance-contingent private-recognition certificate (T2) treatment has an effect on the dropout rates of the remaining motive-types of volunteers. Lastly, we also examine whether the treatment effect of T1 on dropout rates increases as their other-regarding motive and career motive for volunteering strengthen. To improve precision of estimates, we categorize high-O and high-C volunteers as high motivation group, and all remaining volunteers as low motivation group, and regress the dropout indicator against treatments, motivation, interaction terms of treatments and

motivation, and a set of control variables. The positive and statistically significant coefficient for the interaction term in column 6 in Table 4 confirms that the treatment effect of T1 on dropout rates increases as other-regarding and career motives for volunteering increase.

[Table 4]

In summary, our experiment shows that there is a strong incentive backfire or crowding-out effect on the participation of volunteers when they are offered a performance-contingent certificate to be awarded in a public ceremony. The evidence is consistent with Bénabou and Tirole's (2006) model prediction that as the visibility of volunteers' altruism behavior and acceptance of rewards increases, offering them strong non-financial incentives can actually lower their participation. Since this prediction is only possible when the correlation between other-regarding motive for volunteering and career motive for volunteering is positive, we further test whether this correlation is positive in the data and also whether the incentive backfire effect on retention increases as volunteers' other-regarding motive for volunteering and career motive for volunteering increase. Our tests confirm that this key condition in Bénabou and Tirole's (2006) theory holds up.

6.2 Dropout decision by the past academic achievement of CBs

Although the model presented in section 2 is silent about how the past academic achievement of a volunteer may influence their responses to incentives, it provides additional testable implications of the model.

[Table 5]

First, Table 5 shows that among the sample of volunteers in the participation-based certificate treatment (T3) group who did not drop out of the program, those with strong past academic achievement are more likely to have students who experienced an increase in average grade points in the public examination. We focus on volunteers in T3 to ensure that we measure the correlation between their student performance and their own, without the influences of the performance-contingent certificate treatments. Given this positive relationship between the volunteer's own past academic achievement and her student's performance, it is reasonable to expect a high-achieving

volunteer to view her probability of getting the performance-contingent certificate to be greater than that of a low-achieving volunteer. Thus, by equation (18), the visibility factor x is greater for high-achieving volunteers than for low-achieving volunteers in the performance-contingent public-recognition treatment group, amplifying the incentive backfire effect. Second, given that high-achieving volunteers already have good academic records, the labor market returns to the superior certificates are likely to be lower for them. By equation (18), this lower value of v_y implies a greater incentive backfire effect. Therefore, dropout rates for high-achieving volunteers are expected to be higher than low-achieving volunteers when they are assigned into the performance-contingent public-recognition certificate treatment group.

Table 6 reports the treatment effects for various types of volunteers. Panel A reports treatment effects for low-achieving volunteers, whereas panel B reports treatment effects for high-achieving volunteers. Column 1 reports estimates for all volunteers, columns 2 to 5 report estimates for the four motive-types of volunteers, and column 6 reports estimates that show whether the treatment effects on dropout rates increase as both motives for volunteering strengthen.

[Table 6]

The estimates in panel A in Table 6 show that for low-achieving volunteers, the performance-contingent public-recognition certificate treatment (T1) does not have a significant effect on their dropout rates. For low-O and high-C volunteers with low past academic achievement, the T1 treatment effect is actually -0.068 even though it is not statistically significant (column 4). The lower dropout rates among them is expected as their valuations for the superior certificate reward are likely to be high. The estimates in panel B show that for high-achieving volunteers, the performance-contingent public-recognition certificate treatment has a positive and statistically significant effect on their likelihood of dropping out of the program. The treatment effect is 0.09, representing nearly a 50-percent increase in the dropout rates of CBs in the participation-based treatment group (T3). For high-O and high-C volunteers with high academic achievement, the T1 treatment effect is as large as 0.151, representing almost a 100-percent increase in the dropout rates of CBs in the participation-based treatment group (T3). These results confirm that the predictions of Bénabou and Tirole's (2006) theory.

CBs who are highly motivated by altruism and career concerns and have high past academic achievement are the type of volunteers that BRAC is looking for, as they can contribute the most to improving academic outcomes of underprivileged students in rural Bangladesh. The findings here mean that rewarding volunteers with a high-visibility performance-contingent certificate will severely backfire, unless the public-recognition reward incentivize those remained in (attracted to) the program to over perform.

6.3 Performance Effects of Performance-Contingent Non-Financial Incentives

We have shown strong evidence of an incentive backfire effect on the participation of volunteers in the CB program when they are offered the performance-contingent certificate to be awarded in a public ceremony, and no effect on the participation of volunteers in the CB program when they are offered the performance-contingent certificate to be awarded privately. According to the model predictions in section 2, the effects of the non-financial reward schemes on students' academic performance may be different. We next examine the effects of the performance-contingent non-financial incentives on student performance. Note that because 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. We first present a simple graphical analysis of average treatment effects on student performance before we present estimates based on regression that include additional control variables as well as estimates by type of volunteers.

[Figure 3]

Figure 3 shows student performance by treatment and type of test/examination. Panels A and B report average students' standardized test scores in mathematics and English, 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 volunteer tutors are assigned into the performance-contingent public-recognition certificate treatment (T1) group than when their volunteer tutors are assigned into the participation-based certificate 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 performance-contingent private-recognition certificate treatment (T2) group and CBs assigned into the participation-based certificate 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 dropout rates increase in the performance-contingent public-recognition certificate treatment (T1) group, volunteers remaining in the program are incentivized to perform, leading to an overall improvement in student performance in the standardized tests, which have better power to discriminate student performance than the national public and in-school examinations do.

[Table 7]

Table 7 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 five columns present the results for student performance in mathematics, while the last five columns present the results for student performance in English. Columns 1 and 6 focus on students taught by all volunteers, whereas columns 2 to 5 and columns 7 to 10 focus on students taught by volunteers of different motive types.

Panel A in Table 7 shows that students whose volunteer tutors are assigned into the performance-contingent public-recognition certificate treatment (T1) group perform significantly better than students whose volunteer tutors are assigned into the participation-based certificate treatment (T3) group in both standardized mathematics (column 1) and English (column 6) tests. The difference in mathematics standardized test scores is 0.254, which represents a 7.2 percent improvement, whereas the difference in English standardized test scores is 0.199, which also represents a 7.2 percent improvement. However, students whose volunteer tutors are assigned into the performance-contingent private-recognition certificate treatment (T2) group perform similarly to students whose volunteer tutors are assigned into the participation-based certificate treatment (T3) group in both mathematics (column 1) and English (column 6) standardized tests. On the other hand, columns 1 and 6 in panel B show that students of volunteers assigned into all three treatment groups have similar average grade points in the national public or in-school mathematics and

English examination. The results mean that even though the performance-contingent public-recognition certificate treatment increases the likelihood of volunteer tutors dropping out of the program, it incentivizes volunteer tutors 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 standardized test performance of students taught by volunteer tutors with different volunteering motives, only students whose volunteers with low-other regarding and high career motives for volunteering experience statistically significant improvement (column 4 in panel A of Table 7), if their volunteer tutors are assigned into the performance-contingent public-recognition certificate treatment (T1) group but not if their volunteer tutors are assigned into the performance-contingent private-recognition certificate treatment (T1) group. When we look at the English standardized test performance of students taught by volunteer tutors with different volunteering motives, we find that students whose volunteers with high other-regarding and low career motive for volunteering (column 8 in panel A) and volunteers with low other-regarding and low career motive for volunteering (column 10 in panel A) experience statistically significant improvement, if their volunteer tutors are assigned into the performance-contingent public-recognition certificate treatment (T1) group but not if their volunteer tutors are assigned into the performance-contingent private-recognition certificate treatment (T2) group. Students taught by volunteer tutors with other volunteering motive types do not experience statistically significant improvement in their standardized Mathematics or English test performance whether they are assigned into T1 group or 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 tutors' volunteering motive type.

Table 7 seems to indicate that T1 incentivizes volunteer tutors with different motives for volunteering to perform differently depending on the subject they teach. For mathematics, it seems that volunteers with strong career motive for volunteering respond positively, whereas for English, it seems that volunteers with weak career motive for volunteering respond positively. The somewhat inconsistent responses by volunteering motive type is probably because the effect of the non-financial incentive differs by the past academic achievement of volunteers. Recall that in Table 5, we show that the dropout rates among volunteers with high past academic achievement increase in response to the performance-contingent public-recognition certificate, whereas the dropout rates tend to decrease (though not statistically significant) among volunteers with low past academic

achievement. It is possible that the treatment induces low-achieving CBs to perform. Thus, we may see stronger and more consistent pattern of treatment effects on performance when we split the sample by the past academic achievement of volunteers.

[Table 8]

Table 8 reports the estimated treatment effects on the performance of students tutored by volunteers with low past academic achievement (in panel A) and volunteers with high past academic achievement (in panel B). Columns 1 and 6 report the estimates for all volunteers, whereas columns 2 to 5 and columns 7 to 10 report the estimates for volunteers with different volunteering motives. Panel A shows that the performance-contingent public-recognition certificate (T1) treatment has a strong positive and statistically significant effect on the mathematics (column 1) and English (column 6) standardized test performance of students whose volunteer tutors have low past academic achievement. The positive effect is particularly strong if the low-achieving tutors have low other-regarding motive for volunteering. Furthermore, the positive effect of the performance-contingent public-recognition certificate (T1) treatment is even stronger if the low-achieving tutors have low other-regarding motive and high career motive for volunteering than if the low-achieving tutors have low other-regarding motive and low career motive for volunteering. In contrast, panel B shows that the performance-contingent public-recognition certificate (T1) treatment and the performance-contingent private-recognition certificate (T2) treatment do not have a significant effect on the mathematics and English standardized test performance of students whose volunteer tutors have high past academic achievement, regardless of their motives for volunteering. The results are consistent with the model prediction that among tutors whose labor market returns to having the superior certificates are higher and who have low intrinsic valuation for prosocial behavior, the public recognition reward is more effective in incentivizing them to perform.

Overall, the findings imply that CBs who are less effective tutors and less motivated to volunteer for other-regarding reasons, but have the most to gain in the labor market from getting the reward, are induced to increase effort and improve performance. The non-financial reward discourages the participation of highly motivated and high-achieving volunteers presumably sought after by BRAC, but it induces those for which BRAC is not particularly after to “over”

perform. Thus, even though offering the performance-contingent public-recognition certificate leads to an adverse selection effect on the type of volunteers participating in the program, it “crowds in” the motivation of those who self-select to stay in the program and leads to an overall improvement in performance. Our findings imply that non-financial incentives may backfire in one aspect, but it may still lead to the desired outcome depending on how the incentives influence those who self-select into participation.

7. Robustness to alternative measures of other-regarding and career motives

In our analysis presented above, we classify a volunteer as having high other-regarding motive for volunteering when the total scores in the three questions that best capture their other-regarding motive for volunteering exceed the sample mean of 18 (out of 21). Similarly, we also classify a volunteer as having high career motive for volunteering when the total scores in the three questions that best capture their career motive for volunteering exceed the sample mean of 18 (out of 21). We now consider additional survey questions to classify a volunteer’s other-regarding and career motives for volunteering. For other-regarding motive, in addition to the three questions previously considered, we include responses to two other questions that may also capture a volunteer’s other-regarding motive: “I feel it is important to help others” and “I can do something for a cause that is important to me.” With the addition of these two questions, about 58 percent of volunteers who have higher than the sample mean of 31 (out of 35) are now classified as having high other-regarding motive for volunteering. For career motive, we also consider two other questions that may also capture a volunteer’s career motive: “Volunteering allows me to explore different career options” and “Volunteering will help me succeed in my chosen profession.” Adding these two questions into the total scores of career motive for volunteering, about 62 percent of volunteers who have higher than the sample mean of 30.9 (out of 35) are now classified as having high career motive for volunteering. The correlation between these two motives is 0.418 and statistically significant ($p < 0.000$), indicating the key identifying assumption of the model still holds up.

[Table 9]

Using each of these alternative measures together with our preferred measures of other-regarding and career motives, we again classify volunteers into four motive-types as before and estimate the treatment effects for these four types of volunteers. Panel A in Table 9 reports the treatment effects on dropout rates for these four types of volunteers using the alternative measure of other-regarding motive together with the preferred measure of career motive. Panel B in Table 9 reports the treatment effects on dropout rates for these four types of volunteers using the preferred measure of other-regarding motive together with the alternative measure of career motive. The signs and statistical significance of estimates remain fairly similar to those reported in Table 4. Using the alternative measure of other-regarding motive for volunteering somewhat weakens the statistical significance, while using the alternative measure of career motive for volunteering slightly strengthens the statistical significance.

[Table 10]

We use the alternative measures of motive-types to re-estimate the treatment effects on the standardized test scores of students taught by low-achieving CBs. Panel A in Table 10 reports the results for standardized test scores using the alternative measure of other-regarding motive for volunteering, whereas panel B in Table 10 reports the results using the alternative measure of career motive for volunteering. The results are similar to those previously reported in panel A in Table 8, although some estimates become less precise when the alternative measure of career motive for volunteering is used. Overall, we still find that student performance improves among low-achieving CBs, particularly those whose other-regarding motive for volunteering is also low.

8. Alternative explanations

The central idea of Bénabou and Tirole's (2006) theory is that individuals are altruistic and also concerned about their social reputation regarding their altruism preferences. This idea drives the incentive backfire effect in the performance-contingent public-recognition treatment group, especially among volunteers with high other-regarding motive and career motive for volunteering, because the reward creates doubt about their other-regarding motive for volunteering. In the following, we first examine whether the observed increase in dropout rates can be explained by other forms of reputational concern unrelated to other-regarding motive for volunteering. We do

so by assuming that individuals do not have reputational concern related to other-regarding motive for volunteering and examine whether alternative theories can explain our experimental findings independent of other-regarding motive for volunteering. Second, we also examine whether our results can be consistent with other incentive backfire explanations without appealing to the notion of reputational concern at all. If these alternative theories cannot generate all of the predictions as well as Bénabou and Tirole's (2006) theory does, then we have strong confidence in Bénabou and Tirole's (2006) theory as the primary candidate to explain our experimental results.

8.1 Intrinsic valuation and reputational concern for conscientiousness

One may think of an alternative theory where volunteers have intrinsic valuations for prosocial activities, non-financial rewards, and conscientiousness, but only reputational concerns for conscientiousness and greed. The v_a term in the reputation payoff function in Bénabou and Tirole's (2006) model is now replaced by the term v_c , the intrinsic valuation for conscientiousness, in this alternative model, as well as having an additional $v_c a$ term in direct benefit part. According to this alternative theory, individuals volunteer because they also value diligence and like to be perceived as hardworking. One may argue that a volunteer's own past academic achievement is a reasonable proxy for their conscientious type given the standard education production function where achievement is increasing in effort. This alternative model also predicts that offering the performance-contingent public recognition certificate reward may lead to an increase in dropout rates. The increase in dropout rates is also expected to be greater among high-achieving volunteers.

For the performance-contingent public-recognition certificate treatment (T1) to increase dropout rates, while other-regarding motive for volunteering does not carry any reputational benefit, this alternative model must also predict that: (1) past academic achievement (conscientiousness) and career motive are likely to be positively correlated; and (2) the extent to which the treatment effect of T1 on dropout rates increases as the correlation between conscientiousness and career motive increases is *independent* of other-regarding motive for volunteering. The data do not support these predictions. First, the relationship between past academic achievement and career motive is -0.014, although not statistically different from zero ($p < 0.374$). Second, Table 11 shows that the extent to which the treatment effect of T1 on dropout rates increases as the correlation between conscientiousness and career motive increases is statistically not different from zero when CBs' other-regarding motive for volunteering is low

(column 1), but it is statistically significant when CBs' other-regarding motive for volunteering is high (column 2). These estimates mean that the incentive backfire effect depends on CBs' reputational concern for their other-regarding motive for volunteering. Thus, this alternative theory cannot fully explain our experimental findings.

[Table 11]

8.2 Intrinsic valuation for success and reputational loss from failure

One may also imagine an alternative theory that rests on the idea that individuals dislike being perceived as a failure. Consider the case where volunteers have intrinsic valuations for prosocial activities, success, and non-financial rewards, but only reputational concerns to not be perceived as a failure and fame seeking. The volunteer's failure to meet the performance threshold requirement will be revealed to others (implicitly) when the superior certificate is awarded in a public ceremony. In this alternative model, the performance-contingent public-recognition certificate treatment may increase dropout rates by publicly shaming those who fail to meet the performance threshold, albeit implicitly.

This alternative theory also provides additional predictions for us to test. First, one may expect dropout rates to be higher for low-achieving volunteers because they are less likely to meet the performance threshold than high-achieving volunteers. However, our results presented in Table 6 indicate that high-achieving volunteers are more likely to drop out in the performance-contingent public-recognition certificate treatment group. Alternatively, one may instead argue that high-achieving volunteers 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 performance-contingent public-recognition certificate treatment exposes high-achieving volunteers to the risk of tarnishing their reputation of success. Given this interpretation, high-achieving volunteers are more likely to drop out of the program when assigned into the performance-contingent public-recognition certificate treatment group, which is consistent with our results presented above.

This second interpretation is more difficult to test because we do not have a direct measure of loss or risk aversion in our data to examine whether the increased dropout rates among high-achieving volunteers vary with the degree of their loss or risk aversion. Nonetheless, following the

logic of the argument, we would expect the extent of loss to be larger for the more successful high-achieving volunteers than the less successful high-achieving volunteers. By splitting the high-achieving volunteers in the top end and bottom end, we can examine whether the increase in dropout rates due to the performance-contingent public recognition treatment differs across these two groups of high-achieving volunteers. Relatedly, one may argue that the self-confidence of a high-achieving volunteer is likely to influence her subjective probability of whether she will meet the performance threshold. Then, a highly confident high-achieving volunteer 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. We do not have a direct measure of self-confidence in our baseline data, but in the volunteering motivation questionnaires, volunteers rated whether they joined the program to improve their self-esteem on a seven-point Likert scale. 33 percent of volunteers rated this reason below seven and we classify them as having a high level of confidence.¹⁹

Column 3 in Table 11 shows that although the dropout rate is slightly higher for top-end high-achieving volunteers than bottom-end high-achieving volunteers when they are offered the performance-contingent public-recognition certificate, the difference is not statistically significant ($p < 0.76$). Column 4 in Table 11 shows that the dropout rate is similar between confident high-achieving volunteers and unconfident high-achieving volunteers when they are assigned the performance-contingent public-recognition certificate treatment. 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.

8.3 Motivation crowding out in the absence of reputational concern

It is possible that the performance-contingent public-recognition certificate leads to the incentive backfire effect through the “looking-glass-self” mechanism that Bénabou and Tirole (2003) formalize. Specifically, the offering of the performance-contingent public-recognition certificate signals to volunteers about the difficulty of the task about which the volunteer utilizing organization has private information but the volunteers do not. The performance-contingent public-recognition

¹⁹ 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.

certificate may then be interpreted as a high-powered incentive, signaling the task being difficult and the organization lacks confidence in volunteers' ability to perform well in the task in general. Without appealing to the notion of reputational concern, this alternative theory also predicts dropout rates to increase when volunteers are offered the performance-contingent public-recognition certificate. This alternative theory also yields additional predictions that can be further tested. In particular, it predicts that volunteers who drop out of the program are likely to be: (1) those who have greater tendency to struggle with the task; and (2) those who have lower confidence about their ability. Our findings that high-achieving volunteers are more likely to drop out contradict the first prediction (Table 6). Our findings that confident and unconfident high-achieving volunteers are equally likely to drop out contradict the second prediction (column 4 in Table 11).

Another alternative mechanism in the absence of the reputational concern channel is that the introduction of the performance-contingent certificate shifts a volunteer's decision frame from a prosocial frame to a career frame (e.g., Heyman and Ariely, 2004). It is possible that under the career frame the non-financial reward is too small to be of any help for volunteers. Then, the payoff from volunteering ends up being lower in the career frame than in the prosocial frame, leading to an increase in overall dropout rates. This alternative theory also predicts that: (1) performance-contingent private-recognition certificate treatment will increase dropout rates more than performance-contingent public-recognition certificate treatment will, because the value of the private-recognition certificate is smaller; and (2) the performance-contingent public-recognition certificate treatment will increase the dropout rates among volunteers whose career motive for volunteering is low relatively more than the dropout rates among volunteers whose career motive for volunteering is high. Our estimates in Table 4 do not fully support these predictions, as dropout rates are greater for performance-contingent public-recognition certificate treatment and CBs with high career motive for volunteering are more likely to drop out than CBs with low career motive for volunteering.

9. Conclusion

This paper uses a large-scale randomized controlled field experiment embedded within BRAC's existing volunteer tutor program in Bangladesh to examine the effects of the use of non-financial incentives on the retention and performance of volunteers. We offer a performance-contingent

public-recognition certificate award and a performance-contingent private-recognition certificate award to volunteers several months after they have joined the program to test the effects of these non-financial incentives, relative to a participation-based certificate award, on volunteers' dropout rates and their students' academic performance.

Building upon the seminal work of Bénabou and Tirole (2006) to inform the experimental design and interpretation of findings, we show that offering the performance-contingent public-recognition certificate award, which exogenously increases the reward for volunteering activity and also the visibility of volunteers' prosocial behaviors, leads to a 21-percent increase in dropout rates. On the other hand, offering the performance-contingent private-recognition certificate award, which does not influence the visibility of volunteers' prosocial behaviors, has no implication on the dropout rates of volunteers. The incentive backfire effect on retention is particularly acute for high-achieving volunteers whose other-regarding motive and career motive for volunteering are also high. The dropout rates double for these volunteers, whom volunteer utilizing organizations presumably aim to attract and retain. Although dropout rates increase, we find that students benefit from the performance-contingent public-recognition certificate incentive, on average. The reason is that volunteer tutors who remained in the program, especially those who have low other-regarding motive for volunteering and most to gain from the public-recognition reward, are incentivized to perform.

Our results are consistent with Bénabou and Tirole's (2006) theory that when altruistic individuals have concerns for social reputation and prefer to appear as prosocial (public spirited) and not greedy, using external rewards and public recognition of their prosocial activities to incentivize them may actually lower participation. The extent of this backfire effect is likely to be most severe among those who have strong preferences for prosocial activities and rewards, because they may be perceived as greedy rather than prosocial by partaking in volunteering activities that will lead to rewards and publicity, and as a result, they reduce participation to avoid potential reputational costs. Because this incentive backfire effect on participation heavily rests on the idea that individuals would like to appear as prosocial and rewards create doubt about their true motive for volunteering, we also examine whether other forms of reputational concerns, including reputational concern for appearing conscientious and reputational concern for not appearing a failure, may fully explain our findings without appealing to the reputational concern for prosocial preferences. We also examine whether the incentive backfire effect can be explained without

appealing to the notion of reputation concern. We find that these alternative mechanisms do not explain our findings as well as Bénabou and Tirole's (2006) theory does.

Our findings imply that when individuals can self-select into different incentive schemes, as in most transactions in the marketplace, using public-recognition non-financial rewards to incentivize volunteers may backfire by discouraging the type of individuals whom volunteer utilizing organizations are especially looking for. Nonetheless, the net effect of public-recognition non-financial rewards on the performance of participating volunteers is a priori ambiguous, even if these rewards seemingly lead to an adverse selection effect on the pool of participating volunteers. In typical market transactions, it is possible for incentives to improve the performance of individuals if participants who self-select into the program are predominantly those who are the most responsive to the incentives offered. Then, we will not necessarily see the negative effect of incentives on performance that is sometimes shown in laboratory experiments where individuals' participation decisions are made irrelevant. Our results also imply that if volunteers are not motivated by altruism at all, such as the 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
Performance-contingent public-recognition certificate (T1)	165	1398	1886
Performance-contingent private-recognition certificate (T2)	165	1384	1947
Participation-based certificate (T3)	165	1380	1897
Total	495	4164	5730

Table 2: Summary statistics by treatment and tests of balance

	T1	T2	T3	T3 – T1	T3 – T1	Joint-Diff
	Mean	Mean	Mean	Mean	Mean	F-Statistics
	(std. err.)	(std. err.)	(std. err.)	(std. err.)	(std. err.)	(p-value)
<i>A. CB's characteristics</i>						
Age	20.08 (0.16)	20.31 (0.17)	20.08 (0.16)	0.00 (0.23)	-0.23 (0.23)	0.36 (0.70)
Male (=1)	0.44 (0.01)	0.45 (0.01)	0.44 (0.01)	0.00 (0.02)	-0.01 (0.02)	0.03 (0.97)
Years of schooling	11.01 (0.04)	11.09 (0.04)	11.03 (0.04)	0.02 (0.05)	-0.06 (0.05)	0.42 (0.65)
Private tuition experience	0.36 (0.01)	0.37 (0.01)	0.35 (0.01)	-0.01 (0.23)	-0.02 (0.23)	0.23 (0.80)
High past academic achievement (=1)	0.51 (0.01)	0.47 (0.01)	0.50 (0.01)	-0.01 (0.02)	0.03 (0.02)	1.21 (0.30)
High other-regarding motive (=1)	0.64 (0.01)	0.65 (0.01)	0.63 (0.01)	-0.01 (0.02)	-0.02 (0.02)	0.27 (0.77)
High career motive (=1)	0.62 (0.01)	0.63 (0.01)	0.62 (0.01)	0.00 (0.02)	-0.02 (0.02)	0.21 (0.81)
Number of observations	1398	1384	1380			
<i>B. Student's characteristics</i>						
PSC mathematics grade	3.59 (0.03)	3.61 (0.02)	3.56 (0.03)	-0.03 (0.04)	-0.04 (0.03)	0.21 (0.81)
PSC English grade	3.17 (0.02)	3.18 (0.02)	3.12 (0.02)	-0.04 (0.03)	-0.05 (0.03)	0.44 (0.65)
Age	12.79 (0.02)	12.82 (0.02)	12.80 (0.02)	0.01 (0.02)	-0.02 (0.02)	0.16 (0.85)
Male (=1)	0.40 (0.01)	0.40 (0.01)	0.40 (0.01)	0.00 (0.02)	0.00 (0.02)	0.02 (0.98)
Family met CB min. once p/week (=1)	0.81 (0.01)	0.81 (0.01)	0.81 (0.01)	0.00 (0.01)	0.00 (0.01)	0.01 (0.99)
Poverty status (=1)	0.76 (0.01)	0.78 (0.01)	0.78 (0.01)	0.01 (0.01)	0.00 (0.01)	0.18 (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.

Table 3: Correlation between other-regarding motive and career motive for volunteering

Career motive	Other-regarding motive		Total
	Low	High	
Low	846 (0.203)	716 (0.172)	1,562 (0.375)
High	662 (0.159)	1,938 (0.466)	2,600 (0.625)
Total	1,508 (0.362)	2,654 (0.638)	4,162 (1.000)

Notes: Frequency reported in parentheses. $\chi^2 = 347.9$ ($p < 0.001$). Correlation between other-regarding motive and career motive for volunteering is 0.289 ($p < 0.001$)

Table 4: The effects of treatments on the likelihood of dropping out of the program

	(1) All CBs	(2) High-O High-C	(3) High-O Low-C	(4) Low-O High-C	(5) Low-O Low-C	(6) All CBs
Public-recognition certificate (T1)	0.042** (0.021)	0.075*** (0.027)	0.043 (0.045)	-0.030 (0.043)	0.026 (0.037)	0.013 (0.026)
Private-recognition certificate (T2)	0.002 (0.022)	0.019 (0.027)	-0.049 (0.040)	0.000 (0.042)	0.011 (0.039)	-0.014 (0.027)
T1 x High-O-High-C						0.061* (0.033)
T2 x High-O-High-C						0.033 (0.032)
High-O-High-C						-0.033 (0.022)
Observations	4162	1938	716	662	846	4162
R^2	0.008	0.011	0.015	0.008	0.021	0.009
Dropout rate in T3/omitted category	0.196	0.178	0.209	0.226	0.205	0.212

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. Standard errors, clustered at the school level, are reported in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 5: Correlation between CB's past achievement and performance measures in T3

	(1) Average	(2) Math	(3) English	(4) Average	(5) Math	(6) English
High past achievement	0.170* (0.093)	0.211* (0.111)	0.129 (0.102)	0.181* (0.094)	0.172* (0.100)	0.190* (0.104)
Observations	1250	1250	1250	1250	1250	1250
R-squared	0.155	0.118	0.124	0.055	0.044	0.049

Notes: The sample includes only individuals in the participation certification group (T3). All specifications 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. 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 treatments on the likelihood of dropping out of the program by CB's past achievement

	(1) All CBs	(2) High-O High-C	(3) High-O Low-C	(4) Low-O High-C	(5) Low-O Low-C	(6) All CBs
<i>A. Low past-achievement CBs</i>						
Public-recognition certificate (T1)	-0.007 (0.024)	0.002 (0.034)	0.037 (0.058)	-0.068 (0.056)	-0.011 (0.047)	-0.015 (0.031)
Private-recognition certificate (T2)	-0.001 (0.025)	0.001 (0.034)	-0.017 (0.053)	-0.023 (0.056)	0.037 (0.053)	-0.002 (0.031)
T1 x High-O-High-C						0.017 (0.044)
T2 x High-O-High-C						0.003 (0.041)
High-O-High-C						-0.016 (0.029)
Observations	2126	1000	348	342	436	2126
R^2	0.005	0.003	0.011	0.010	0.022	0.005
Dropout rate in T3/omitted category	0.208	0.199	0.202	0.227	0.219	0.217
<i>B. High past-achievement CBs</i>						
Public-recognition certificate (T1)	0.089*** (0.030)	0.150*** (0.039)	0.047 (0.062)	0.010 (0.062)	0.062 (0.052)	0.040 (0.038)
Private-recognition certificate (T2)	0.002 (0.029)	0.036 (0.038)	-0.081 (0.054)	0.033 (0.061)	-0.021 (0.048)	-0.028 (0.035)
T1 x High-O-High-C						0.109** (0.048)
T2 x High-O-High-C						0.066 (0.046)
High-O-High-C						-0.055* (0.030)
Observations	2036	938	368	320	410	2036
R^2	0.019	0.032	0.024	0.032	0.032	0.022
Dropout rate in T3/omitted category	0.184	0.155	0.214	0.225	0.190	0.208

Notes: All specifications are linear probability regression models that also 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. Standard errors, clustered at the school level, are reported in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 7: The effects of the treatments on students' academic performance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	All Types	High-O High-C	High-O Low-C	Low-O High-C	Low-O Low-C	All Types	High-O High-C	High-O Low-C	Low-O High-C	Low-O Low-C
A. Standardized tests										
Public-recognition certificate (T1)	0.254*	0.154	0.246	0.545*	0.311	0.199**	0.104	0.282**	0.186	0.379**
	(0.153)	(0.188)	(0.238)	(0.294)	(0.232)	(0.083)	(0.102)	(0.141)	(0.184)	(0.159)
Private-recognition certificate (T2)	0.059	0.105	-0.112	0.126	0.124	0.043	-0.040	0.100	0.024	0.185
	(0.140)	(0.176)	(0.213)	(0.237)	(0.237)	(0.089)	(0.111)	(0.142)	(0.181)	(0.157)
Observations	3024	1407	525	496	596	3024	1407	525	496	596
R^2	0.021	0.016	0.042	0.040	0.017	0.023	0.013	0.063	0.032	0.042
Mean score in T3/omitted cat.	3.550	3.549	3.546	3.378	3.682	2.780	2.833	2.742	2.927	2.587
B. Public examination										
Public-recognition certificate (T1)	0.069	0.022	0.144	0.010	0.193	0.003	0.028	-0.005	-0.035	0.007
	(0.099)	(0.137)	(0.169)	(0.157)	(0.163)	(0.088)	(0.112)	(0.159)	(0.140)	(0.146)
Private-recognition certificate (T2)	0.007	-0.001	0.064	-0.094	0.096	0.054	0.059	0.028	0.070	0.078
	(0.101)	(0.135)	(0.151)	(0.158)	(0.160)	(0.093)	(0.117)	(0.140)	(0.138)	(0.145)
Observations	4514	2146	757	729	882	4514	2146	757	729	882
R^2	0.043	0.038	0.061	0.052	0.046	0.045	0.036	0.067	0.060	0.063
Mean GPA in T3/omitted cat.	2.388	2.383	2.310	2.486	2.383	2.285	2.272	2.274	2.397	2.411

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. Standard errors, clustered at the school level, are reported in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 8: The effects of the treatments on students' performance in standardized tests by CB's past academic achievement

	(1) All Types	(2) High-O High-C	(3) High-O Low-C	(4) Low-O High-C	(5) Low-O Low-C	(6) All Types	(7) High-O High-C	(8) High-O Low-C	(9) Low-O High-C	(10) Low-O Low-C
<i>A. Low past achievement CB</i>										
Public-recognition certificate (T1)	0.438** (0.189)	0.292 (0.240)	0.111 (0.320)	1.058*** (0.390)	0.522* (0.287)	0.279*** (0.102)	0.101 (0.131)	0.298 (0.206)	0.533** (0.237)	0.515** (0.220)
Private-recognition certificate (T2)	0.003 (0.168)	-0.042 (0.214)	-0.164 (0.265)	0.121 (0.327)	0.231 (0.305)	0.043 (0.107)	-0.056 (0.132)	0.003 (0.206)	0.273 (0.238)	0.141 (0.215)
Observations	1532	740	252	252	288	1532	740	252	252	288
R^2	0.027	0.029	0.048	0.070	0.037	0.035	0.030	0.090	0.047	0.060
Mean score in T3/omitted cat.	3.492	3.599	3.452	3.277	3.445	2.787	2.872	2.740	2.795	2.627
<i>B. High past achievement CB</i>										
Public-recognition certificate (T1)	0.066 (0.175)	-0.023 (0.210)	0.416 (0.318)	0.018 (0.344)	0.139 (0.319)	0.115 (0.102)	0.095 (0.136)	0.271 (0.188)	-0.165 (0.240)	0.249 (0.196)
Private-recognition certificate (T2)	0.118 (0.164)	0.249 (0.209)	-0.017 (0.305)	0.087 (0.282)	0.067 (0.303)	0.043 (0.110)	-0.034 (0.146)	0.197 (0.193)	-0.196 (0.243)	0.225 (0.206)
Observations	1492	667	273	244	308	1492	667	273	244	308
R^2	0.022	0.021	0.061	0.098	0.011	0.017	0.007	0.050	0.060	0.035
Mean GPA in T3/omitted cat.	3.608	3.496	3.622	3.481	3.912	2.772	2.790	2.744	3.062	2.549

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. Standard errors, clustered at the school level, are reported in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

**Table 9: The effects of treatments on the likelihood of dropping out of the program –
Alternative measures of other-regarding and career motives**

	(1) High-O High-C	(2) High-O Low-C	(3) Low-O High-C	(4) Low-O Low-C
<i>Alternative measure of O-type</i>				
Public-recognition certificate (T1)	0.061** (0.027)	0.059 (0.050)	0.010 (0.043)	0.020 (0.035)
Private-recognition certificate (T2)	0.012 (0.029)	-0.040 (0.044)	0.017 (0.041)	-0.002 (0.037)
Observations	1869	558	731	1004
R^2	0.009	0.013	0.006	0.022
<i>Alternative measure of C-type</i>				
Public-recognition certificate (T1)	0.073*** (0.027)	0.045 (0.047)	-0.082* (0.043)	0.060 (0.037)
Private-recognition certificate (T2)	0.012 (0.027)	-0.031 (0.042)	-0.032 (0.045)	0.029 (0.039)
Observations	2003	651	597	911
R^2	0.010	0.014	0.012	0.026

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. Standard errors, clustered at the school level, are reported in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

**Table 10: The effects of the treatments on students' standardized test performance of CBs with low past achievement—
Alternative measures of other-regarding and career motives**

	(1) High-O High-C	(2) High-O Low-C	(3) Low-O High-C	(4) Low-O Low-C	(5) High-O High-C	(6) High-O Low-C	(7) Low-O High-C	(8) Low-O Low-C
<i>Alternative measure of O-type</i>								
Public-recognition certificate (T1)	0.265 (0.245)	-0.106 (0.397)	1.034*** (0.394)	0.661** (0.285)	0.051 (0.148)	0.116 (0.262)	0.504** (0.250)	0.479** (0.205)
Private-recognition certificate (T2)	-0.065 (0.220)	-0.195 (0.324)	0.078 (0.348)	0.076 (0.300)	-0.031 (0.148)	-0.099 (0.266)	0.251 (0.246)	-0.014 (0.213)
Observations	577	149	221	282	577	149	221	282
R^2	0.026	0.068	0.078	0.041	0.024	0.126	0.054	0.098
<i>Alternative measure of C-type</i>								
Public-recognition certificate (T1)	0.304 (0.236)	0.122 (0.385)	1.307*** (0.414)	0.439 (0.310)	0.157 (0.151)	0.164 (0.232)	0.435 (0.281)	0.401** (0.201)
Private-recognition certificate (T2)	-0.134 (0.209)	0.045 (0.337)	0.306 (0.373)	-0.098 (0.341)	0.056 (0.144)	-0.213 (0.248)	0.397 (0.283)	-0.111 (0.216)
Observations	602	178	187	262	602	178	187	262
R^2	0.035	0.043	0.107	0.035	0.021	0.153	0.059	0.059

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, CB's past academic achievements, and the average of students' PSC performance as additional control variables. Standard errors, clustered at the school level, are reported in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 11: Robustness to alternative explanations

	(1)	(2)	(3)	(4)
	Low-O	High-O	High past achievement	High past achievement
Public-recognition certificate (T1)	0.000 (0.031)	0.021 (0.028)	0.083** (0.033)	0.088*** (0.034)
Private-recognition certificate (T2)	0.001 (0.033)	-0.018 (0.027)	0.005 (0.032)	0.003 (0.031)
T1 x High-past-achievement-High-C	0.001 (0.066)	0.127*** (0.045)		
T2 x High-past-achievement-High-C	0.019 (0.063)	0.056 (0.042)		
High-past-achievement-High-C	0.011 (0.046)	-0.053* (0.029)		
T1 x Top-end high past achievement			0.015 (0.050)	
T2 x Top-end high past achievement			-0.004 (0.045)	
Top-end High past achievement			0.008 (0.033)	
T1 x Confident high past achievement				0.001 (0.054)
T2 x Confident high past achievement				-0.007 (0.050)
Confident				-0.016 (0.036)
Observations	1508	2654	2036	2036
R^2	0.012	0.014	0.019	0.019

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. Standard errors, clustered at the school level, are reported in parentheses. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Figure 1: Dropout Rates by Treatment

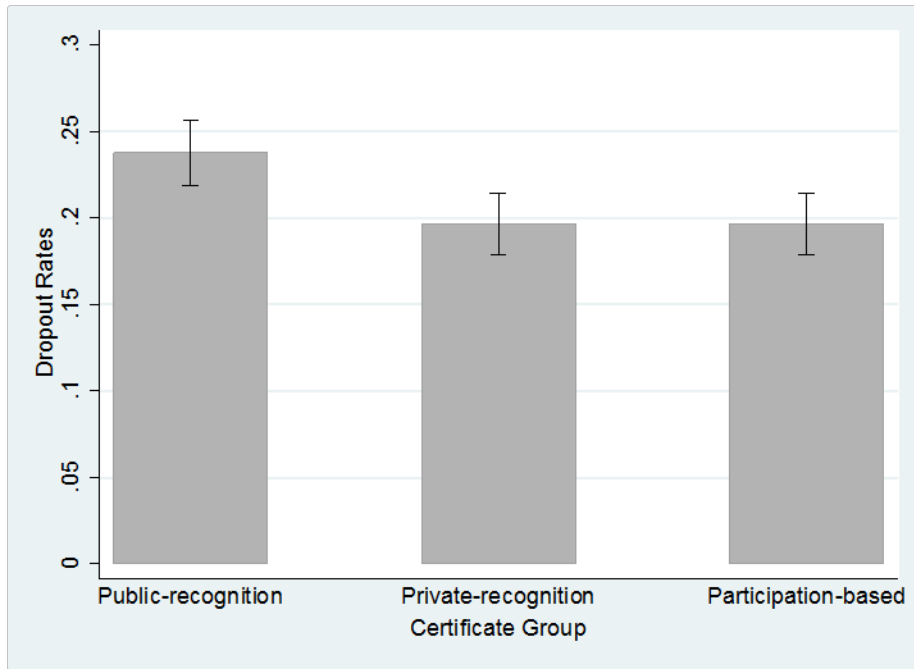


Figure 2: Dropout Rates by Treatment and Volunteering Motive

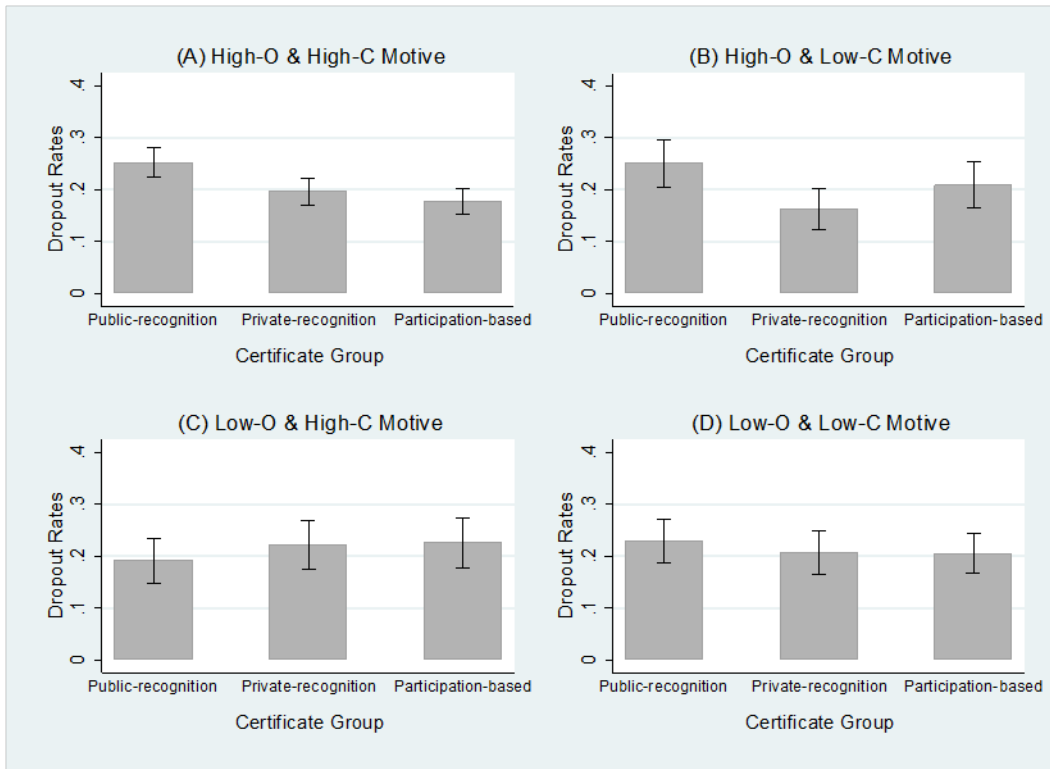
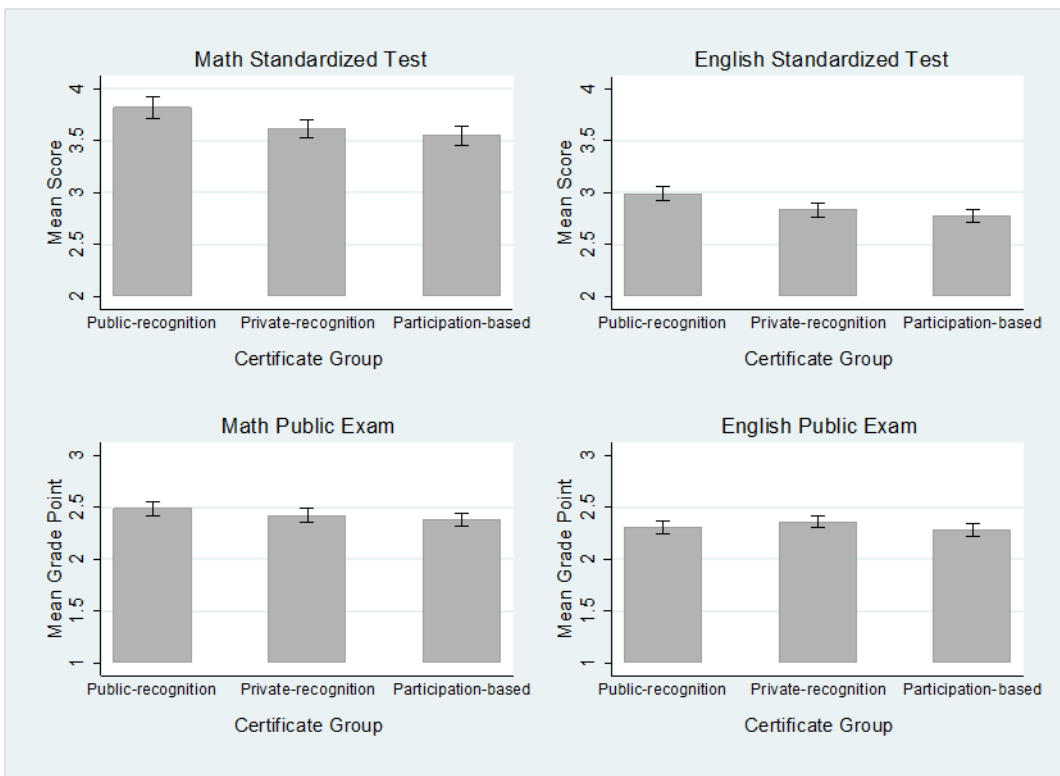


Figure 3: Student Performance by Treatment and Test



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. **Superior 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 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**.

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,

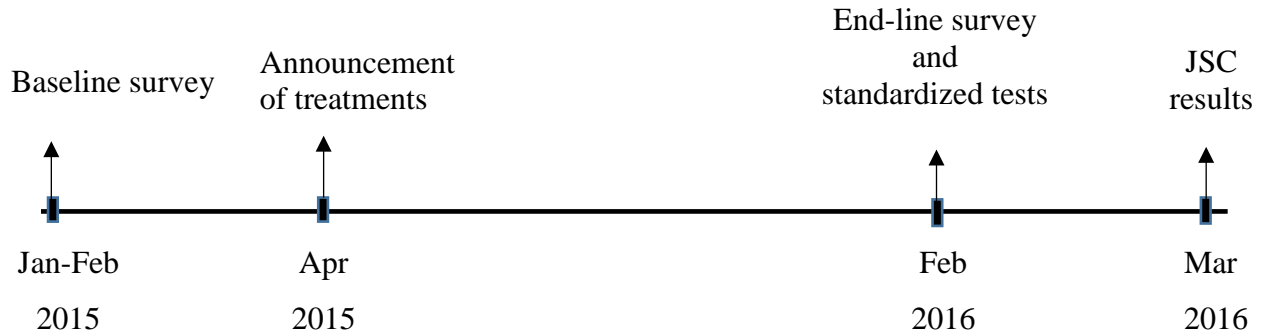
Appendix B

Timeline of the Project

Program Implementation



Research Implementation



Appendix C

Table C.1: CBs' and students' characteristics (standardized test sample)

	T1	T2	T3	T3 – T1	T3 – T1	Joint-Diff
	Mean	Mean	Mean	Mean	Mean	F-Statistics
	(std. err.)	(std. err.)	(std. err.)	(std. err.)	(std. err.)	(p-value)
<i>C. CB's characteristics</i>						
Age	20.20 (0.19)	20.20 (0.18)	20.29 (0.19)	0.09 (0.27)	0.09 (0.27)	0.05 (0.95)
Male (=1)	0.46 (0.02)	0.42 (0.02)	0.44 (0.02)	-0.02 (0.02)	0.02 (0.02)	0.67 (0.51)
Years of schooling	11.07 (0.05)	11.08 (0.05)	11.08 (0.05)	0.01 (0.07)	0.00 (0.06)	0.02 (0.98)
Private tuition experience	0.38 (0.02)	0.36 (0.01)	0.37 (0.02)	-0.01 (0.27)	0.01 (0.27)	0.29 (0.75)
High past academic achievement (=1)	0.49 (0.02)	0.49 (0.02)	0.50 (0.02)	0.01 (0.02)	0.01 (0.02)	0.13 (0.88)
High other-regarding motive (=1)	0.64 (0.02)	0.66 (0.01)	0.62 (0.02)	-0.02 (0.02)	-0.04 (0.02)	0.76 (0.47)
High career motive (=1)	0.62 (0.02)	0.64 (0.01)	0.62 (0.02)	0.00 (0.02)	-0.02 (0.02)	0.40 (0.67)
<i>D. Student's characteristics</i>						
PSC mathematics grade	3.69 (0.03)	3.67 (0.03)	3.66 (0.03)	-0.03 (0.05)	0.00 (0.05)	0.07 (0.93)
PSC English grade	3.25 (0.03)	3.26 (0.03)	3.19 (0.03)	-0.06 (0.05)	-0.07 (0.05)	0.71 (0.49)
Age	12.79 (0.02)	12.82 (0.02)	12.81 (0.02)	0.02 (0.03)	-0.01 (0.03)	0.18 (0.83)
Male (=1)	0.42 (0.02)	0.35 (0.01)	0.39 (0.02)	-0.04 (0.02)	0.03 (0.02)	2.29 (0.10)
Family met CB min. once p/week (=1)	0.82 (0.01)	0.81 (0.01)	0.81 (0.01)	-0.01 (0.02)	-0.01 (0.02)	0.03 (0.97)
Poverty status (=1)	0.74 (0.01)	0.78 (0.01)	0.77 (0.01)	0.02 (0.02)	-0.01 (0.02)	0.87 (0.42)
<i>E. Standardized test</i>						
Sample size of test takers	976	1032	1066			
Original sample size of students	1886	1947	1897			
Proportion with standardized test data	0.52 (0.02)	0.53 (0.02)	0.54 (0.01)	-0.02 (0.02)	-0.01 (0.02)	0.35 (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.

Appendix D



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