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## Self Confidence Spillovers and Motivated Beliefs

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Is success in a task used strategically by individuals to motivate their beliefs prior to taking action in a subsequent, unrelated, task? Is the distortion of beliefs reinforced for individuals who have lower status in society, and for that reason may need more motivation to undertake this task? Conducting an artefactual experiment in India, we show that success when competing in a first task increases the performers' self-confidence and competitiveness in the subsequent task. We also find that such spillovers affect the self-confidence of low-status individuals more than that of highstatus individuals.

### Keywords:

Motivated beliefs, spillovers, self-confidence, competitiveness, Affirmative Action, experiment

### JEL codes:

C91, J15, M52

# Self-Confidence Spillovers, Status and Motivated Beliefs\*

Ritwik Banerjee<sup>†</sup> Nabanita Datta Gupta<sup>‡</sup> and Marie Claire Villeval<sup>§</sup>

June 26, 2019

## Abstract

Is success in a task used strategically by individuals to motivate their beliefs prior to taking action in a subsequent, unrelated, task? Is the distortion of beliefs reinforced for individuals who have lower status in society, and for that reason may need more motivation to undertake this task? Conducting an artefactual field experiment in India, we show that success when competing in a first task increases the performers' self-confidence and competitiveness in the subsequent task. We also find that such spillovers affect the self-confidence of low-status individuals more than that of high-status individuals.

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<sup>†</sup>Indian Institute of Management Bangalore and IZA, Bannerghatta Main Road, Sundar Ram Shetty Nagar, Bilekahalli, Bengaluru, Karnataka 560076 India; [ritwikbanerjee@iimb.ac.in](mailto:ritwikbanerjee@iimb.ac.in).

<sup>‡</sup>Department of Economics and Business Economics, Aarhus University, Denmark; IZA, Bonn. Fuglesangs All 4, 8210 Aarhus V, Denmark; [ndg@econ.au.dk](mailto:ndg@econ.au.dk)

<sup>§</sup>Univ Lyon, CNRS, GATE UMR 5824, F-69130 Ecully, France; IZA, Bonn; [villeval@gate.cnrs.fr](mailto:villeval@gate.cnrs.fr).

# 1 Introduction

Before undertaking a risky action where only a fraction of candidates can succeed, individuals need to be convinced that their ability gives them a reasonable chance to be successful, since costly effort will be expended. This is the case for investors who have to decide whether entering a new market and for any individual who has to decide on whether or not to invest in a selective education program or to apply for a promotion. When individuals have imperfect information about their ability, they may distort their beliefs to motivate themselves to undertake a task or to persevere in an activity, for affective reasons (Kőszegi, 2006) or for instrumental reasons (Bénabou and Tirole, 2002; Bénabou, 2015). Several strategies are used by individuals to distort their beliefs and motivate themselves. These include overconfidence (Camerer and Lovo, 1999; Barber and Odean, 2001; Hoelzl and Rustichini, 2005; Malmendier and Tate, 2008; Moore and Healy, 2008), information avoidance (Carrillo and Mariotti, 2000; Karlsson et al., 2009; Sweeny et al., 2010; Burks et al., 2013), wishful thinking (Mayraz, 2011), denial of reality (Bénabou and Tirole, 2002), selective updating (Möbius et al., 2014; Eil and Rao, 2011), or selective memory (Li, 2013; Gottlieb, 2014; Zimmermann, 2019; Chew et al., 2018; Saucet and Villeval, 2019).<sup>1</sup>

In this paper, we explore another mechanism by which individuals may distort their beliefs to motivate themselves in a competitive environment: confidence spillovers. After receiving positive feedback on being more successful than others in a given activity, individuals may be inclined to generalize this relative ability advantage in one activity to other, independent, activities, although success in the first activity is objectively silent on the ability to succeed in the subsequent, unrelated, activities. Similarly, succeeding at sports is often credited for building self-esteem in children which helps them perform well in other spheres, such as at school or when interacting with their peers. While the previous literature has investigated extensively the impact of relative feedback on belief updating, goal setting and competitiveness within the same task (*e.g.*, Eriksson et al. (2009); Azmat and Iriberry (2010); Gill and Prowse (2014); Wozniak et al. (2015); Buser (2016)), it is almost silent on the across-task impact of feedback. The only exception is a recent paper by Huang and Murad (2017) that investigates whether gender differences in overcon-

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<sup>1</sup>Signals about one's ability and overconfidence can also be used to persuade or deceive others (Schwardmann and van der Weele, 2016; Ke et al., 2019), or to influence them in competitive settings (Charness et al., 2018). In contrast with this strategic manipulation of beliefs, in this paper we consider a self-directed manipulation of beliefs.

confidence and competitiveness react to feedback. They found that the impact of feedback on competitiveness operates independently of feedback effects on beliefs, and that the gender difference in competitiveness disappears when feedback is provided.<sup>2</sup>

Our first contribution is testing whether individuals use their success in one task as a self-enhancement strategy to inflate their belief about their ability to succeed in another independent task, and whether they decide to compete in the second task on the basis of these motivated beliefs. If inflated beliefs were only due to non-motivated mistakes, then they should be independent of the success in the previous task. Regardless of whether motivated beliefs are driven by affective (ego-utility) or by strategic reasons (motivating oneself to compete), we anticipate that the spillover, if any, is asymmetric. Receiving negative feedback on one's ability relative to that of competitors may be less likely to spill over on the beliefs about one's ability to succeed in another unrelated task. This conjecture is inspired by theoretical models which assume that people tend to forget negative feedback (*e.g.*, [Rabin and Schrag \(1999\)](#); [Compte and Postlewaite \(2004\)](#)). This is also consistent with previous studies showing that people discount bad news ([Sharot, 2011](#)), process information on relative self asymmetrically (*e.g.*, [Eil and Rao \(2011\)](#); [Ertac \(2011\)](#)) and treat positive signals as more informative than negative ones ([Möbius et al., 2014](#)).

A second contribution of our paper is studying whether confidence spillovers are affected by an individual's social status. Indeed, when a group feels discriminated in society, its members may have a greater need for motivating their beliefs in order to compete against higher status individuals. Competing means comparing oneself with an opponent: this may not only request confidence in one's relative skills but also prime one's relative rank in the society. For example, studies in psychology (*e.g.*, [Tor et al. \(2006\)](#)) have shown that competition increases with the proximity to the top of a hierarchy; thus, individuals who, by status, are further away from high rank opponents but are nevertheless attracted by the expected payoff of competing may need extra motivation to compete compared to high status individuals. We anticipate that this may be provided by motivated beliefs. Thus, we test whether lower status individuals are more likely to inflate their beliefs on their ability after receiving good news on their relative performance in an unrelated task, compared to

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<sup>2</sup>The two projects developed independently. While they explore retrospective competitive preferences, we measure the willingness to compete. As explained below, one important novelty of our paper is studying how the spillover effect is conditioned by status and to which extent it is affected by a prior policy intervention.

higher status individuals.

To study the spillover effects of feedback on one’s success in a prior competitive task on self-confidence in another task and to test whether status matters in this process, we have conducted a lab-in-the-field experiment in a highly socially segmented society, India. One of the many ways in which status segmentation is manifested in the Indian society is through the caste system.<sup>3</sup> We recruited 360 subjects in 17 villages from South 24 Parganas district of West Bengal. 171 subjects were from the General category (a higher status category), 189 from the Scheduled Castes and the Scheduled Tribe category (lower status categories).<sup>4</sup> Subjects were matched in groups of six, with three subjects from the General category and three subjects from the other castes. The caste composition of groups was made common knowledge. We hypothesized that lower caste members might need to motivate their beliefs more in order to compete with higher caste members to compensate for a perceived disadvantage.

The experiment consists of four treatments. The structure of the Baseline treatment is close to that of [Niederle and Vesterlund \(2007\)](#) and to that used in our companion paper in which we study the spillover effects of Affirmative Action policies on self-confidence *within* the same task ([Banerjee et al., 2017](#)).<sup>5</sup> In the first part, subjects performed a memory task under a piece-rate payment scheme. In the second part, they performed the same memory task under a tournament payment scheme in groups of six performers with two winners. Then, in the third part subjects had to choose the payment scheme to be applied to their performance in this new part. Subjects did not receive any feedback on their score in any part. In the fourth part we introduced a new, unrelated, task involving a motor-skill

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<sup>3</sup>Caste is an age-old system of rigid and hierarchical social stratification, primarily among the Hindus in India, maintained mainly through endogamy. The caste system has resulted in the total exclusion of certain groups from the rights and opportunities for advancement. The most marginalized groups are the Scheduled Castes and the Scheduled Tribes (tribals living in remote areas, or Adhivasis). The previous literature has shown evidence of a stereotype threat when caste identity is made salient, generating increased performance gaps in standardized tests ([Hoff and Pandey, 2006, 2014](#)) and in relative self-confidence ([Banerjee et al., 2017](#)) in favor of the high caste.

<sup>4</sup>The Scheduled Castes represent 16.6% of the general population in India and the General category about 34% (the rest belong to Scheduled tribes, 8.6%, and Other Backward categories, 41%) (Census 2011). In the study the 185 Scheduled Castes members are aggregated with the 4 Scheduled Tribes members.

<sup>5</sup>Only the first three parts of the Baseline treatment are similar to [Banerjee et al. \(2017\)](#). Note that the region where we conducted the experiment is the same as in [Banerjee et al. \(2017\)](#), but the village/townwards and thus, the participants- are different. From the very beginning of the data collection process, the two experiments were conceived as two independent projects.

ability: in the Ball-in-Bucket task, subjects had to throw a ball in a basket. Like in the third part, before performing this new task subjects had to choose either to be paid with an individual piece-rate payment scheme or to enter a tournament with five other players. In each part, we elicited the subjects' beliefs about their absolute and relative performance by using an incentive compatible mechanism.

Treatment T1 is similar to the Baseline, except that before making their choice in the fourth part subjects received binary feedback on whether they won or lost the compulsory tournament in the other task in the second part. The comparison between the Baseline and this treatment allows us to study whether receiving a positive or a negative feedback on one's relative performance in one task influences self-confidence and the willingness to compete in another, unrelated, task, and whether this depends on the status conferred by caste.

The effect of status on self-confidence and competitiveness can be distorted by policy interventions such as Affirmative Action. A last contribution of our study is studying whether such policy interventions also affect the extent to which status conditions the across-tasks confidence spillovers of feedback. We objectively change the probability of the lower status group to win the competition in the memory task and test whether this affects self-confidence and competitiveness in the unrelated task when the policy is no longer in use. Treatment T2 differs from treatment T1 in that we implemented Affirmative Action in the memory task (but not in the Ball-in-Bucket task): in part 2 a quota tournament is imposed such that at least one of the two winners is the best performer among the lower caste subjects.<sup>6</sup> This allows us to test whether such intervention boosts or weakens the impact of feedback on one's success on self-confidence of subjects across domains depending on their status.<sup>7</sup> Our conjecture is that under Affirmative Action, there are no self-confidence spillovers across tasks for low caste winners and high-caste losers, but there are still self-confidence spillovers (in the opposite direction) for low caste losers and high caste winners. Indeed, since they lost despite the support of the policy,

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<sup>6</sup>Affirmative Action has been introduced decades ago in India to reduce the gap between castes in the access to higher education and jobs (*e.g.*, [Deshpande \(2011\)](#)). After the independence of the country, lists of Scheduled Castes (Dalit) have been established for caste-based job reservations.

<sup>7</sup>Studies have investigated the cross-context impact of reservation policies for females in politics in India. [Ghani et al. \(2014\)](#) showed that political reservations increased females' empowerment and their willingness to start a new business and ([Maitra and Rosenblum, 2017](#)) identified upstream effects of political reservations at the local level. In contrast, we study spillover effects across totally independent tasks within the same individuals.

the low caste losers may feel more pessimistic about their ability to succeed in the new task. On the other hand, the high caste winners may become more optimistic about the new task since they have won in the first task despite their handicap under the quota policy.

Finally, it is important to control for whether confidence spillovers across tasks differ from confidence spillovers within the same task. Thus, we added treatment T3 that is similar to treatment T1 except that subjects exclusively performed the Ball-in-Bucket task from part one to part four.

Our results show that although performances in the two tasks are uncorrelated, learning that one is successful when competing in the memory task increases both relative self-confidence and competitiveness in the Ball-in-Bucket task. Thus, we identify confidence spillovers as a source of motivated beliefs in a competitive environment: individuals use their success in one activity to boost their relative self-confidence in their ability to succeed in another, independent, task. As a result, this increases their competitiveness. We also find that the motivation of beliefs is an asymmetric process. If success breeds self-confidence and competitiveness across tasks, failure when competing in one task produces a weaker and less consistent effect in the opposite direction. When learning that they failed in the forced competition in the memory task, losers form lower beliefs about their chance of winning in the new task compared to uninformed losers, but they change neither their belief on being a winner nor their willingness to compete in the Ball-in-Bucket task.

We also show that status mediates the motivation of beliefs: after a success, only the low-caste individuals increase their belief of being one of the two top scorers in the second task, confirming that low-caste individuals do motivate their beliefs more than high-caste individuals following a success. Also, the quota policy in the memory task boosts the confidence of the low-caste members of being among the two top scorers in the second task even though the second task is no longer supported by the policy and regardless of their status of winner or loser in the memory task; as a result, there is no longer a caste difference in competitiveness in the new task, whereas low-caste subjects were less likely to compete than higher-caste individuals in the absence of the policy intervention.

The remainder of this paper is as follows. Section 2 develops the experimental design and the procedures. Section 3 introduces our behavioral conjectures. Section 4 presents



our findings. Section 5 discusses these results and concludes.

## 2 Design and Procedures

We first present the experimental design, then the procedures.

### 2.1 Experimental Design

The experiment consists of four treatments across which we manipulate whether information about success in a forced tournament is revealed or not to the subjects. We vary across parts or treatments the tasks and the rules for determining the winners in the tournament. Each treatment has five parts. To prevent hedging in earnings and wealth effects, subjects are paid for one part randomly selected at the end of the session. We first describe the tasks and the Baseline treatment and then, move on to the other treatments.

#### 2.1.1 The Tasks

Since we are interested in examining whether success in one domain generates a positive spillover in self-confidence and attitude to competition in an orthogonal domain, we implement two tasks that demand different skill sets to be performed successfully. The task that is used in the first three parts of all treatments except the third one is a memory task. An experimenter calls out 15 numbers, randomly drawn between 0 and 100, one at a time. After all the numbers have been called out, subjects are given three minutes to recall and write down as many numbers as they can remember. A subject's score is given by the number of correctly recalled numbers.

The second task that is used in the fourth part of treatments T1 and T2 and in all parts of treatment T3 is a Ball-in-Bucket task (BiB, henceforth). Subjects are given fifteen hard plastic balls and are asked to toss them one by one into a bucket placed 3.5 meters away. A successful toss means that the ball enters the bucket and stays there. The task is simple to explain and implement with relatively low educated participants. It has been used in artefactual field experiments in the past (*e.g.*, [Gneezy et al. \(2009\)](#)) and demands skills which are orthogonal to skills necessary for the first task. Indeed, in the data the correlation between the scores in the memory game and the BiB game is found to be essentially zero. [Figure A.3](#) in [Appendix A.5](#) displays a scatter plot of scores in the memory task in part 1

(all treatments pooled) and in the BiB task in part 4. This figure shows no evidence of a correlation between the score in the two tasks. We also estimated a regression in which the dependent variable is the score in the BiB task and the independent variable is the score in the memory task. This variable is far from being significant ( $p=0.945$ ). Therefore, ability in the first task cannot predict success in the second one. Moreover, the two tasks are isomorphic, as subjects earn the same amount through piece rate or tournament payment schemes for the same number of correct recalls and successful tosses.

### 2.1.2 Baseline Treatment

In the Baseline treatment (T0, henceforth) each session comprises of twelve invited subjects, with six from General category (GC, henceforth) and six from Scheduled Caste category (SC, henceforth). Two groups of six are formed such that each group has three General and three Scheduled Caste category subjects. Subjects are told right at the outset about the caste composition of their group and that the group remains unchanged through the course of the session. Anonymity is preserved since they do not know which of the twelve participants are in their group. Using a design inspired from [Niederle and Vesterlund \(2007\)](#), the content of parts and the compensation schemes are as follows.

*Part 1 - Piece rate in the memory task:* Subjects are paid for their individual absolute performance. They receive a piece rate of 10 Indian Rupees (INR) for every correctly recalled number during the three minutes (INR10 = \$0.56 in 2015 Purchasing Power Parity).

*Part 2 - Tournament in the memory task:* The top two performers in the group of six are the winners and they earn INR 30 for every correctly recalled number whereas the losers get nothing. In case of a tie, a random draw selects the winners.

*Part 3 - Choice of compensation scheme in the memory task:* First, before performing the task again, subjects choose between being paid a piece rate for their absolute performance or entering a tournament. The comparison between the competing subject's performance in part 3 and the performances of the five other group members in the forced tournament in part 2 (regardless of their choice in part 3) determines whether the competing subject is a winner in part 3. If the subject's score is among the two highest scores,

the subject is a winner, otherwise he earns INR0 in this part.

The subjects are never informed about their absolute or their relative performance in the memory task in any part. They do not receive any feedback about whether or not they are a winner in part 2 until the end of the session.

*Part 4 – Choice of compensation scheme for the Ball-in-Bucket task:* Contrary to the previous parts, subjects now have to perform the Ball-in-Bucket task. First, they are given a demonstration of the task at hand by one experimenter. Then, they have to choose whether they want to be paid a piece rate or by a tournament payment scheme for their performance in this part. If the subject chooses the piece rate, he earns INR10 for every ball that lands up in the bucket. If he chooses the tournament and if he ends up being one of the top two scorers, he earns INR30 for each successful toss; otherwise, he earns nothing. Tournament winners in part 4 are decided by comparing intra-group performances in part 4, regardless of the choice of the five other group members. When they choose their compensation scheme, subjects do not know how good they are at the BiB task. When they perform the task, they are isolated from the other participants and cannot see how well they perform relative to others.

It is important to note that our objective is to compare relative confidence and competitiveness across treatments and not between parts 3 and 4. Indeed, such a between-part comparison would not be informative since we introduced more than one change between part 3 and part 4: the task is different; in the BiB task subjects can directly observe their absolute performance when performing the task, while in the memory task they can only form a belief about it; subjects have no chance to practice the task under each payment scheme before making their choice;<sup>8</sup> and finally, the winner is determined by comparing the score of the competitor with that of all the other players in the same part although they may have made different payment choices. Part 3 only aimed at familiarizing subjects with a choice between two payment schemes.

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<sup>8</sup>Decomposing part 4 into three parts (BiB under a piece-rate scheme, then under a tournament scheme, and finally a choice between the compensation schemes) would have increased the duration of the session and would have certainly reduced the chance to observe spillovers across tasks. Note that this decomposition is done in T3.

*Part 5 - Risk elicitation:* Risk attitudes may influence the choice of a payment scheme. Thus, we elicited the subjects risk attitudes by using the method of Gneezy and Potters (1997) adapted by Charness and Gneezy (2010).<sup>9</sup>

### 2.1.3 Other Treatments

*Treatment T1* - This treatment replicates the Baseline treatment, except that between part 3 and part 4 subjects are given feedback on whether they won or lost the forced tournament in part 2. The result is written on a piece of paper and privately handed out to the subjects along with the response sheet. After seeing this outcome, subjects move on to their decision in part 4. Comparing T0 and T1 allows us to test whether subjects who learn they were winners in the forced tournament in the first task are more likely than uninformed winners to believe that they can win the tournament in the second task.

*Treatment T2* - T2 is similar to T1, except that a quota-based Affirmative Action (AA, henceforth) is introduced in parts 2 and 3. In the Quota tournament, one of the two winners is necessarily the best performer from the SC category and the other winner is the best performer among the five other members. In part 4, however, subjects choose between piece rate and a standard tournament (without quota) payment scheme. Comparing T2 and T1 allows us to test whether a policy intervention such as quotas makes the manipulation of beliefs more or less likely depending on success or failure in the forced tournament and on caste status.

*Treatment T3* - Comparing T0 and T1 indicates whether success in one task breeds confidence in one's ability in the other task. However, how does the cross-domain spillover compare with the within-domain spillover? T3 is designed to answer that question. It is similar to T1 except that subjects play the Ball-in-Bucket task in all parts. At the end of part 3, subjects are informed on whether they are among the winners in part 2 or not. Since in part 2 subjects perform the BiB task and are paid by tournament scheme, the spillover we measure is from feedback on success in one domain to self-confidence and competitiveness in the same domain. Note that since subjects perform repeatedly the same task in T3,

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<sup>9</sup>Subjects receive INR100 and they can invest any amount, between 0 and 100 included, in a risky project. With 50% chance the amount invested is trebled and with 50% chance it is lost. The payoff is the initial endowment minus the amount invested plus the return from investment. A risk-neutral or risk-seeking agent should invest his entire endowment. Lower investments indicate a degree of risk aversion.

we capture also expected learning effects on absolute performance between part 4 and the previous parts. Thus, if we find similar spillover effects across domains and within the same domain when focusing on beliefs about the absolute performance, the difference between across-domain and within-domain spillovers may be underestimated. However, this should not affect beliefs about relative performance.

Table 1 summarizes the main characteristics of our experimental design.

*Table 1: Summary of the Experimental Design*

	T0 Baseline	T1 Feedback	T2 (Feedback + Quota)	T3 (Feedback + Single Task)
Part 1	M, Piece-Rate	M, Piece-Rate	M, Piece-Rate	BiB, Piece Rate
Part 2	M, Tournament	M, Tournament	M, Quota Tournament	BiB, Tournament
Part 3	M, Choice between piece rate and tournament	M, Choice between piece rate and tournament	M, Choice between piece rate and tournament	BiB, Choice between piece rate and tournament
Part 4	BiB, Choice between piece rate and tournament	Info on Part 2 result, BiB, Choice between piece rate and tournament	Info on Part 2 result, BiB, Choice between piece rate and tournament	Info on Part 2 result, BiB, Choice between piece rate and tournament

*Note:* M refers to the memory task and BiB to the Ball-in-Bucket task.

### 2.1.4 Belief Elicitation

In treatments T0 to T2, at the end of each part after performing the task subjects report their beliefs about their absolute and their relative performance. They report their absolute self-confidence by answering to the question: “How many numbers do you think you have correctly written down?”. Relative self-confidence, on the other hand, is captured from responses to the following two questions: “Between 1 and 6, which rank do you think you have obtained, compared to the five other group members?” and “What is the chance, in percent, that you will be among the winners of your group?”. In T2, subjects have to

report their perceived within-caste rank in addition to overall rank. In parts 3 and 4 the questions on relative performance are asked regardless of the choice of the payment scheme. In part 4 of all treatments and in each part of T3, subjects are asked to report their belief about how many balls they think they will be able to put in the bucket before they go on to perform the BiB task, unlike in the other task. Indeed, in the BiB task subject are able to see immediately what their absolute performance is while performing the task. The relative self-confidence is elicited after completion of the task, like in the other task.

We incentivize responses to these questions to encourage subjects to report their true beliefs without introducing hedging. The incentive scheme has been kept very simple for the purpose of making it comprehensible to the subject pool.<sup>10</sup> Eliciting beliefs gives us rich data on the evolution of beliefs following feedback that we can use to identify spillover effects.

## 2.2 Procedures

We conducted the experiment in South 24 Parganas district of West Bengal, India. Nine blocks in the district were randomly chosen and two village/town-wards were randomly selected from each block.<sup>11</sup> Appendix A.2 displays maps of the sampled villages/wards and Appendix A.3 shows pictures of some of the experimental sites in various public spaces (schools, open spaces, ...). In each village we recruited twelve to twenty four subjects with the help of local intelligence to guarantee a balance in the number of GC and SC subjects. Finally, the study has been conducted in 17 villages and has involved 360 subjects (171 GC subjects, 185 SC subjects, and 4 Scheduled Tribe category subjects; the ST subjects are pooled with the SC subjects in the data analysis).

Table A1 in Appendix A.4 displays the descriptive statistics of the subject pools across

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<sup>10</sup>See instructions in Appendix A.1. For each question on absolute and on relative confidence in the part randomly selected for payment at the end of the session, we paid subjects INR50 if their prediction matched their actual score or rank. For the estimate of the chance of being a winner, subjects had to indicate a number between 0 and 100, with 0 if they were absolutely sure they were not among the top two, 100 if they were absolutely sure that they were among the top two, and some number in between 0 and 100 depending on how sure they were of being among the top two. They could earn between INR0 and INR50 for answering this question. We told them that the more truthful they were in their report, the higher the bonus would be. We also proposed to those who were interested to explain the details of the procedure at the end of the session (see Figure A.1 in Appendix A.5).

<sup>11</sup>The census data which was used for sampling purposes identifies at the village or ward-of-a-town level.

the four treatments. The subject composition is roughly balanced across treatments: females represent between 41% and 49% of the sample, the average age is between 18.9 to 22.3 years, between 51% to 53% belong to the SC group. Subjects invest on average from INR36 to 44 from their INR100 endowment in the risk elicitation game, which indicates a substantial degree of risk aversion.

Twelve subjects participated in each session. Upon arrival, subjects were randomly assigned a desk and had to read and sign an Informed Consent form (translated to Bengali). Then, they received a set of instructions. Instructions for the next part were distributed after completion of the previous part. Most of the experiment has been conducted with pen and paper. The BiB task was conducted in a separate place such that tosses were made in isolation. All questions were answered in private. Each session lasted for 75 to 90 minutes. Subjects received a show up fee of INR100. Moreover, earnings from the different parts ranged from INR100 to INR550, with an average of INR268 (~\$15 in PPP terms).

### 3 Predictions

In this section we motivate our main behavioral conjectures from a theoretical framework inspired by Bénabou and Tirole (2002) and Bénabou (2015). The framework, presented in Appendix A.2, models a risk neutral individual's decision to enter a tournament. At the very outset, the individual performs in a task. Subsequently she is given information about her success or failure, following which she decides whether to exert effort in another task which is unrelated to the first one. The framework yields the following conjectures regarding self-confidence spillovers in the context of our experimental design:

**Conjecture 1:** *When subjects receive positive feedback about their relative performance in the memory task, there will be a boost in self-confidence when asked to evaluate their relative and absolute abilities in the BiB task, although the two tasks are independent.*

If conjecture 1 is supported by the data, we should observe a higher tournament entry in part 4 for the subjects who received good news in T1 compared to the uninformed winners in T0.

What about the impact of receiving negative feedback? If a subject receives bad news

on her relative performance in the first task, we expect there will be no spillover in the form of lower self-confidence in the second task since there is no expected utility gain from such a strategy. This is also consistent with the optimism bias showing that humans discount bad news when updating their beliefs (Sharot, 2011), and with asymmetric information processing by which people tend to overweight positive feedback relative to negative feedback when ego is at stake (Möbius et al., 2014). Thus, we conjecture that receiving negative feedback on one’s ability relative to that of competitors in one task is unlikely to spill over on the beliefs about one’s ability to succeed in the second independent task.

**Conjecture 2:** *When subjects receive negative feedback about their relative performance in the memory task, this will not significantly influence their self-confidence in the BiB task.*

If conjecture 2 is supported by the data, we should observe no difference in tournament entry in part 4 between the subjects who received bad news in T1 and the uninformed losers in T0.

Our third conjecture is that low-caste individuals will be more likely to motivate beliefs compared to high-caste individuals after receiving positive feedback. Low-caste individuals have been for centuries evaluated as being inferior to high-caste individuals of the same ability. Thus, holding a higher  $k$  they have a greater gain in utility to be in the  $S$  state. In contrast, high-caste members are more used to winning and should react less to good news in the independent task. Considering now the  $F$  state, we conjecture that receiving negative feedback on relative ability in the first task spills over negatively on the low-caste members’ beliefs about their ability to succeed in the second task, because it reminds them of their lower status. We expect no effect in high-caste subjects.

**Conjecture 3:** *After receiving positive (negative, conversely) feedback about their relative performance in the memory task, low-caste members are more likely to boost (decrease, respectively) their self-confidence about the second task compared to high-caste members.*

If conjecture 3 is supported by the data, then we should observe that informed winners (losers, conversely) from the low caste are more (less, respectively) likely to enter the tournament in part 4 in T1 compared to uninformed winners (losers, respectively) in T0.



Our last conjecture has to do with Affirmative Action. AA should make self-deception less likely by decreasing the gain in utility from the  $S$  state when belonging to a low caste (*i.e.*, by decreasing  $k$ ). Low-caste subjects are aware that in part 4 they will no longer benefit from AA: even if they need more motivation to engage in competition in this condition, self-deception is more difficult when knowing that being a winner may be due to AA. Thus, we conjecture that there will be no self-confidence spillovers when low-caste subjects receive good news under AA because the benefit of AA discounts the informative value of being a winner in part 2.<sup>12</sup> On the other hand, the high-caste winners may boost their confidence after receiving good news because they learn they won the tournament despite AA (they should ignore bad news because they can persuade themselves that they lost because of AA).

**Conjecture 4:** *Under Affirmative Action, there is no self-confidence spillover across unrelated tasks for low-caste winners whereas there may be spillovers for high-caste winners.*

If conjecture 4 is supported by the data, then we should observe that the low-caste winners and the high-caste losers in T2 enter the tournament in part 4 in the same proportion as in T0. We also expect that high-caste winners will enter more in part 4 in T2 compared to T0.

## 4 Results

We first study self-confidence spillovers and their possible asymmetry, without considering status. Next, we consider the roles of caste status and Affirmative Action. We conclude with an analysis of the effects of spillovers on efficiency.

### 4.1 Self-Confidence Spillovers Across Tasks

Before analyzing confidence spillovers, we consider whether score, absolute self-confidence and relative self-confidence vary across treatments. Table A2 in Appendix A.4 shows that there is no significant difference in the mean score in part 1 between T1 and T0. The combination of effort and ability is similar across these treatments before we introduce any

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<sup>12</sup>In our companion paper Banerjee et al. (2017) we did not find any within-task spillover effect of having succeeded under AA in a previous round on self-confidence in a new round of the same task without AA.

feedback. The mean score in part 1 in T2 and in the BiB task in T3 is significantly lower than in the memory game in T0.<sup>13</sup> Table A2 also reveals widespread overconfidence, as prediction errors in absolute confidence are in almost all cases positive. The differences in prediction errors with the baseline levels are insignificant in all but two cases: in parts 3 and 4 in T3 compared to T0.<sup>14</sup> Table A3 in Appendix A.4 examines the subjects' relative self-confidence across parts and tasks, measured either on the belief that the subject will be among the two top scorers in their group in parts 2 to 4 (mean proportion of subjects who hold this belief), or on the estimated percentage chance of being a winner. This table indicates that overall, subjects exhibit higher relative self-confidence in all treatments compared to T0, except in parts 3 and 4 when considering the estimated percentage chance of winning. However, none of these differences are significant (all  $p$ -values from  $t$ -tests clustered at the village level are above 0.10).

Although we find no significant differences in absolute or relative self-confidence across the treatments T0 to T2 when considering the full sample of subjects, it is still possible that higher beliefs in one's abilities in the memory task lead to a higher rate of tournament entry for the BiB task. This may differ depending on the success or failure in the forced tournament in part 2. Table 2 tests our first conjecture. It displays the absolute and relative self-confidence measures and the rates of tournament entry in part 4 in the BiB task for the winners and losers of the forced tournament in the memory task performed in part 2 considered separately, by treatment. The last row reports the tournament entry rates in part 4 for all subjects pooled together.

Table 2 shows a significant positive difference in relative self-confidence in T1 and T3 compared to T0 for the winners in the forced tournament in part 2, regardless of how we measure relative self-confidence. The gap between T1 and T0 is not significantly different from the gap between T3 and T0, regardless of which measure of relative self-confidence is considered ( $p=0.936$  for the belief of being one of the two top scorers, and  $p=0.866$  for the perceived chance of winning). We also find significant differences between winners and

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<sup>13</sup>Figure A.2 in Appendix A.5 depicts the distribution of scores in the memory task and in the ball tasks. The BiB task has lower mean but wider variance than the memory task and this is observed in any part.

<sup>14</sup>Subjects playing BiB as the sole task throughout the experiment score lower in absolute self-confidence compared to the baseline memory game. This may result from the fact that since part 1 subjects have been able to observe how well they perform in this task. In contrast, subjects performing the BiB task after the memory task do not show a different level of absolute self-confidence than in T0.

Table 2: Self-Confidence and Tournament Entry in Part 4, by Winner Status in Part 2 and by Treatment

Treatment	T0		T1		T2		T3	
Status in part 2	Winner	Loser	Winner	Loser	Winner	Loser	Winner	Loser
<i>Absolute self-confidence (prediction error)</i>								
Mean values	3.06	2.08	2.00	1.83	2.53	2.23	0.75	0.75
T <sub>i</sub> vs. T0	-	-	-1.06	-0.25	-0.53	0.15	-2.31**	-1.33**
Winner vs. loser	0.98		0.17		0.30		0.00	
<i>Relative self-confidence (belief of being one of the two top scorers)</i>								
Mean values	0.33	0.28	0.59	0.25	0.47	0.34	0.58	0.20
T <sub>i</sub> vs. T0	-	-	0.26**	-0.03	0.14	0.06	0.25*	-0.08
Winner vs. loser	0.05		0.34**		0.13		0.38**	
<i>Relative self-confidence (percent chance of winning)</i>								
Mean values	51.54	50.79	64.30	37.48	57.93	46.22	63.03	38.53
T <sub>i</sub> vs. T0	-	-	13.30**	6.39	-4.57	11.49**	-12.26*	12.76**
Winner vs. loser	0.75		26.82**		11.71		24.50**	
<i>Tournament entry rate</i>								
Mean values	0.29	0.27	0.53	0.25	0.59	0.20	0.57	0.11
T <sub>i</sub> vs. T0	-	-	0.24*	-0.02	0.30*	-0.07	0.28	-0.16**
Winner vs. loser	0.02		0.28*		0.39**		0.46**	
<i>Tournament entry rate (all players)</i>								
Mean values	0.27		0.34		0.33		0.26	
T <sub>i</sub> vs. T0	-		0.07		0.06		-0.01	

Notes: In all treatments self-confidence is for the Ball-in-Bucket task. Winner corresponds to the two players in each group who won the forced tournament in part 2, and loser refers to the four other group members. The comparisons between treatment T<sub>i</sub> (with  $i = 1, 2$  or  $3$ ) and the baseline treatment T0 report  $p$ -values from Mann-Whitney ranksum tests for absolute self-confidence and  $t$ -tests clustered at the village level for other outcomes. \*  $p < 0.10$  \*\*  $p < 0.05$ .

losers in these treatments. Winners in part 2 become more confident in part 4 both within and across tasks, relative to losers. The differences in predicted absolute scores are not significant, however.

Comparing T1 with T0, Table 2 indicates no significant increase in tournament entry rate in the BiB task following feedback on relative performance in the memory task when considering the full sample. However, when looking at the subgroup of winners in the memory task, the picture is slightly different. The tournament entry rate in part 4 is (marginally) significantly higher for the winners in T1 compared to T0, and the gap in competitiveness between winners and losers is significant in all treatments with feedback.<sup>15</sup>

<sup>15</sup>We also made sure that there was no significant difference in tournament entry for either winners or

Supporting conjecture 1, these results indicate that there are spillover effects of success in one domain to another independent domain for those who received good news about their outcome in the forced competition.

To account for differences in individual characteristics of subjects across treatments, we now turn to an econometric analysis to formally test our conjecture. Table 3 reports the marginal effects from regressions in which the dependent variable is either the relative self-confidence in the BiB task, as measured by the belief of being one of the two top scorers (models (1) and (2)) or by the estimated chance of being a winner (models (3) and (4)), or the decision to enter the tournament in the BiB task (models (5) and (6)). Models (1), (2), (5) and (6) are Probit and models (3) and (4) are OLS regressions. Standard errors are clustered at the village level to control for local error correlation across households. The independent variables include being a winner in the tournament in part 2, treatment dummies, and interaction terms between being a winner in part 2 and treatment dummies. In even models, we also control for individual characteristics (caste, risk score, age, female, education and log of family income).

Table 3 shows that being a winner in the memory task in T0 does not increase significantly self-confidence and tournament entry in the BiB task, which is not surprising since subjects do not know this information. But learning that one is a winner in T1 and in T3 increases relative self-confidence significantly in part 4, revealing self-confidence spillovers both within- and across-tasks (see models (1) to (4) in Table 3; see also the first and second panels of Table A4 in Appendix A.4 for separate regressions by treatment). As a result, in terms of tournament entry, being a winner in any of the three treatments with feedback (T1 to T3) has a significant positive effect (see models (5) and (6) and the third panel in Table A4 in Appendix A.4).

We have also estimated a joint model in which the tournament choice is treated as endogenous to the two measures of relative self-confidence. In a first step, we regressed linear probability models to estimate the determinants of relative self-confidence in part 4, and in the second step we estimated probit models of the tournament entry decision also in part 4. In the first step, the independent variables are being a winner and treatment indicators 

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losers between T0 and other treatments in part 3, *i.e.*, before feedback was given.

Table 3: Determinants of Relative Self-Confidence and Tournament Entry in the Second Task (part 4)

Dep. Variable	Relative confidence Belief being one of the 2 top scorers		Relative confidence % chance of winning		Tournament entry decision	
	(1)	(2)	(3)	(4)	(5)	(6)
Winner in part 2	0.06 (0.07)	0.04 (0.10)	0.75 (4.83)	0.77 (4.39)	0.02 (0.10)	-0.03 (0.11)
Treatment T1	-0.04 (0.13)	-0.03 (0.13)	-13.30*** (4.09)	-10.70*** (3.40)	-0.02 (0.12)	-0.04 (0.12)
Treatment T2	0.08 (0.12)	0.08 (0.13)	-4.57 (5.49)	-3.26 (5.54)	-0.07 (0.09)	-0.07 (0.09)
Treatment T3	-0.08 (0.10)	-0.08 (0.11)	-12.25* (6.12)	-9.38 (5.99)	-0.19** (0.08)	-0.17* (0.09)
Winner in part 2 * T1	0.31** (0.13)	0.30* (0.15)	26.08*** (6.11)	23.14*** (6.31)	0.26* (0.13)	0.32** (0.16)
Winner in part 2 * T2	0.06 (0.15)	0.11 (0.18)	10.97 (8.70)	11.27 (8.22)	0.38*** (0.15)	0.44*** (0.15)
Winner in part 2 * T3	0.34** (0.14)	0.27 (0.17)	23.75*** (6.56)	18.32*** (6.06)	0.51*** (0.15)	0.45** (0.19)
Individual characteristics	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>
Nb observations	360	348	360	348	360	348
Pseudo $R^2$	0.060	0.121	-	-	0.100	0.142
$R^2$	-	-	0.109	0.162	-	-

Notes: Marginal effects are reported. Models (1), (2), (5) and (6) are Probit models; models (3) and (4) are OLS. Individual characteristics include: caste, risk score, age, female, education and log of family income. In models with controls for individual characteristics, 12 observations are missing across different sessions (11 missing values for family income and one missing value for education). All standard errors (in parentheses) are clustered at the village level. \*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ .

(alone and interacted with being a winner). In the second step, the independent variables include the level of self-confidence, as estimated in the first step, and standard individual characteristics, as in Table 3. This estimation strategy assumes that the feedback received in the memory task affects the tournament choice in the BiB task only via its (spillover) impact on relative self-confidence. The results are reported in Table A5 in Appendix A.4. The main takeaway from this table is that relative confidence spillovers across domains are significant and promote competitiveness; they are generated mainly through the act of winning the forced competition in the first task in either of the treatments with feedback. This implies that self-confidence in one task is boosted by receiving positive feedback on success in another, unrelated, task, which supports our first conjecture. Winning in part 2 boosts confidence in part 4 also in T3, which indicates (rational) belief updating also

within the same domain.

This analysis is summarized in our first result:

**Result 1:** *Winning the forced tournament in the first task entails spillover effects on self-confidence and competitiveness in a subsequent unrelated task.* This supports conjecture 1.

To test our second conjecture on the asymmetry of spillovers, we now consider whether those who lost the forced tournament in part 2 are losing self-confidence and decrease their entry rate in the tournament in part 4, compared to those who did not receive any feedback (T0). Table 2 indicates that losers in T1 estimate a significantly lower chance of being a winner in part 4 compared to uninformed subjects, but they do not differ from them in terms of absolute self-confidence and of beliefs on being among the two top scorers. Accordingly, their competitiveness in part 4 does not differ from that of uninformed subjects. This is very different from what we found for the winners, which contributes to support conjecture 2 on the asymmetry of spillover effects. In contrast, in T3, within-task, losers in part 2 have lower self-confidence and compete significantly less in part 4 than in T0 and compared to winners. The regressions reported in Table 3 confirm that in T1 the effect of feedback on losers is far weaker and less consistent than the effect on winners (the coefficient associated to T1 is significant only on the chance of winning). This leads to the following result:

**Result 2:** *The spillover effects across domains are asymmetric. Receiving bad news about relative ability in the first task has no effect on the estimated chance of winning the competition and on competitiveness in the new task.* This provides some support to conjecture 2.

## 4.2 The Impact of Caste Status and Affirmative Action on Spillovers Across Tasks

Our third conjecture was that in the absence of an AA policy, subjects from the low caste who receive positive (conversely, negative) feedback about their relative performance in the

memory task are more likely to boost (to decrease, respectively) their self-confidence about the second task than the high-caste subjects. To test this conjecture, Table 4 reports a similar analysis as Table 3, but disaggregated by treatment. This table also allows information about success or failure in the first task to have different effects on self-confidence and competitiveness in the BiB task across castes. The dependent variables are the belief of being among the two top scorers (models (1) to (4)), the estimated chances of being a winner (models (5) to (8)), and the decision to enter the tournament in the BiB task (models (9) to (12)). The independent variables include being a GC (higher caste) winner in the forced tournament in part 2, being a SC (lower caste) winner, being a SC loser, with the GC loser as the reference category, and the same individual characteristics as in Table 3.

The regressions reported in Table 4 related to T1 support only partially this conjecture. Compared to the GC losers, being a SC winner in the forced tournament has a positive and significant effect at the 1% level on the belief of being among the two top scorers and on the perceived chance of being a winner in the BiB task (see models (2) and (6)). In contrast, GC winners and GC losers in T1 share the same beliefs on being one of the two top scorers in the BiB task (see models (2) and (6)). The spillover effect of winning the tournament in the first task on the perceived chance of winning the tournament in the second task is larger for the SC winners than for the GC winners, but not significantly so (see model (6),  $p=0.53$ ). Moreover, contrary to conjecture 3, the relative confidence in the BiB task of the SC losers in the first task does not differ from that of the GC losers. However, their competitiveness in the second task is significantly lower than that of the GC losers. This leads to our third result:

**Result 3:** *Winning the tournament in the first task increases only the low-caste members beliefs of being a winner in the second, unrelated, task. There are negative spillover effects of losing on the low-caste losers competitiveness, but not on their self-confidence.* Conjecture 3 is only partially supported.

Table 4: Determinants of Relative Self-Confidence and Tournament Entry in Part 4 (BiB task), by Treatment

Treatment	Relative confidence				Relative confidence				Tournament entry			
	Belief being one of the 2 top scorers				% chance of winning				decision			
	T0	T1	T2	T3	T0	T1	T2	T3	T0	T1	T2	T3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>Loser part 2-GC</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Winner part 2-GC	0.11	0.20	0.05	0.33	-1.03	22.86**	10.36	16.35***	-0.13	0.21*	0.36**	0.39*
	(0.12)	(0.13)	(0.21)	(0.29)	(8.95)	(7.37)	(12.32)	(4.25)	(0.08)	(0.11)	(0.15)	(0.20)
Winner part 2-SC	0.01	0.39***	0.36**	0.42*	3.80	30.06***	22.38**	16.60*	0.01	0.20*	0.51***	0.58***
	(0.12)	(0.07)	(0.16)	(0.22)	(6.77)	(6.48)	(6.41)	(7.02)	(0.26)	(0.12)	(0.08)	(0.18)
Loser part 2-SC	0.07	-0.09	0.13**	0.05	4.09	2.22	7.43	-4.92	-0.05	-0.18**	0.12	-0.09
	(0.06)	(0.17)	(0.06)	(0.13)	(5.61)	(7.77)	(7.42)	(4.44)	(0.11)	(0.08)	(0.10)	(0.08)
Ind. characteristics	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Nb observations	80	91	95	82	80	91	95	82	80	91	95	82
Pseudo $R^2$	0.093	0.215	0.106	0.159	-	-	-	-	0.127	0.189	0.224	0.228
$R^2$	-	-	-	-	0.214	0.253	0.242	0.307	-	-	-	-

Notes: Marginal effects are reported. Models (1) to (4) and (9) to (12) are Probit models and models (5) to (8) are OLS regressions. Individual characteristics include: risk score, age, female, education and log of family income. All standard errors (in parentheses) are clustered at the village level. \*  $p < 0.1$ \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ .



Our last conjecture was that under AA, there is no self-confidence spillover for low-caste winners and that there might be positive spillovers for high-caste winners. The results are mixed. Considering all the subjects regardless of their caste, Table 2 reveals no difference in the absolute and relative self-confidence in part 4 of both winners and losers in part 2 in T2 compared to T0, while there were significant differences between T1 and T0. This suggests an absence of self-confidence spillovers in T2. On the other hand, winners' competitiveness in the BiB task in T2 (T1, respectively) is 0.30 (0.24, respectively) percent point higher than in T0 (both significant at the 10% level). Thus, being a winner under AA in T2 does not raise self-confidence in part 4 compared to T0, but it tends to increase subsequent competitiveness even though AA is no longer used. This is confirmed by Table 3: models (1) to (4) show no spillover effect of being a winner in the tournament in the first task on relative self-confidence in the second task in T2; but models (5) and (6) reveal a significant spillover on the winners' competitiveness in T2. In contrast to the other treatments, the spillover effects of success in the memory task do not pass through a boost in self-confidence but directly through a boost in competitiveness.

Comparing castes separately in T2 tests conjecture 4 directly. Model (3) in Table 4 indicates that AA boosts the confidence of low-caste members of being among the two top scorers in the BiB task without AA, relative to high-caste members, and this is observed regardless of their status of winner or loser under AA. Model (7) shows that winning under AA boosts the confidence of the low-caste members (compared to the high-caste members) on their chance of winning in the BiB task. Since the low-caste members become more confident, there is no caste difference in competitiveness in the BiB task in T2, both for winners and for losers, while there was a caste gap in competitiveness in T1 (see models (10) and (11)). This analysis goes against conjecture 4. Notice also that receiving bad news under Affirmative Action does not decrease the confidence and competitiveness of the SC losers compared to the GC losers.

**Result 4:** *Receiving good news under Affirmative Action boosts confidence on one's chance of winning in the second task for the low-caste members even though AA is no longer used. It increases the winners' competitiveness regardless of the caste status. Conjecture 4 is not supported.*

### 4.3 Efficiency

A last question is whether the self-confidence spillovers of feedback on relative performance affect efficiency. To analyze efficiency, we examine whether feedback in the memory task led individuals to make better or worst decisions regarding the decision to compete in the BiB task.<sup>16</sup> There are two types of efficiency gains (losses, conversely): when feedback on success in the first task encourages people to compete when they are (when they are not, respectively) among the two most able subjects in the second task, and when feedback on failure in the first task discourages people to compete in the second task when they are not (when they are, respectively) among the two most able subjects. We examine ex-post efficiency by considering the T0 and T1 treatments.

In T1, 77.24% of the less able subjects in the BiB task (*i.e.*, those who were not among the two top-scorers) who received bad news in the memory task rightly decided not to compete in part 4. This is the case for only 50% of the less able subjects who received good news. On the other hand, in T1 54.54% of the most able subjects in the BiB task (*i.e.*, those who were one of the two top-scorers) who received bad news in the memory task rightly decided to compete in part 4. Surprisingly, this is the case for only 33.33% of the most able who received good news. Receiving good news in the first task motivated too many less able subjects to compete in the second task while not helping the most able to compete enough. In contrast, receiving bad news in the first task helped less able people to abstain from competing in the second task without discouraging the most able to compete.

Comparing T0 and T1 suggests that, on average and in tendency, the quality of the less able individuals' decisions decreased and that of the most able individuals increased from receiving feedback on the first task, but the differences are not significant. Indeed, in T0, 75% of the less able subjects in the second task abstained from competing in part 4, and 32.14% of the most able chose to compete. In T1, the respective percentages are 68.75% (*t* test,  $p=0.453$ ) and 40.62% (*t* test,  $p=0.505$ ).<sup>17</sup> This leads to our last result:

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<sup>16</sup>Alternatively, if we measure efficiency by earnings we find no evidence of an impact of the spillovers. The average payoffs in the BiB task are 57.98 points in T0, 67.50 in T1, 61.25 in T2 and 81.19 in T3. Only the payoffs achieved in T3 significantly exceed those achieved in T0 ( $p=0.020$ ), probably because in this treatment subjects performed the same task more than once.

<sup>17</sup>The conclusions do not change if we consider T2 instead of T1. In T2, among the less able subjects in the BiB task 50% of those who received bad news and only 17% of those who received good news rightly decided not to compete. Among the most able subjects in the BiB task only 12.5% of those who received

**Result 5:** *Positive confidence spillovers motivated too many less able subjects to compete in the second task.*

## 5 Discussion and Conclusion

We designed an artefactual field experiment to study if individuals who have to decide on whether to compete or not in a task motivate their beliefs by using their relative performance in a previous, unrelated, task to form expectations about their chance to succeed in the new task. Since the two tasks are independent and solicit different skills, success or failure in the first task should not affect the self-confidence and competitiveness of rational agents in the second task. We examined whether confidence spillovers, if any, were more likely for people with a lower status in the society and how an Affirmative Action policy that modifies the objective probabilities of winning in the first task affects self-confidence spillovers across tasks.

Our results are quite remarkable. We found that success in a first task breeds relative self-confidence and competitiveness across a second unrelated task. Indeed, the individuals who learned that they won the memory tournament became more confident and more willing to compete in the Ball-in-Bucket task, compared to winners who did not receive any feedback. This is different from [Huang and Murad \(2017\)](#) who found evidence of spillover effects on competitiveness but not on confidence. On the other hand, we observed that the individuals who learned that they lost the forced tournament in the first task believed that they had a lower chance of being one of the two top scorers in the second task compared to the uninformed losers, but this did not affect their relative tournament entry decision. Thus, the spillover effect is asymmetric, with stronger and more consistent evidence for those who received good news in the first task than for those who received bad news. We also observed that confidence spillovers across tasks do not differ much from spillovers within the same task. These results support the existence of motivated beliefs.

We also found that winning the tournament in the first task increased the low-caste

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bad news and 21.88% of those who received good news rightly decided to compete. Overall in T2 67.19% of the less able subjects in the BiB task abstained from competing in part 4, and 34.38% of the most able chose to compete. The differences between T2 and T0 are not significant.

members' beliefs of being a winner and their perceived chance of winning in the unrelated task, while it only increased the perceived chance of winning of the high-caste winners. Moreover, receiving good news under Affirmative Action boosted confidence on one's chance of winning in the second task even though the quota policy was no longer used, regardless of caste status. This is very surprising in the case of low status people since their chance of success is objectively lower in the absence than in the presence of the quota policy.

Overall, these results are consistent with the notion that individuals distort their beliefs to motivate themselves in a competitive environment, although success in one task objectively does not predict success in another, unrelated, task. This mechanism seems to be especially important for people whose relative rank in society is low and who may need more motivation to confront people with a higher rank in the hierarchy. Of course, we cannot exclude that other elements than motivated beliefs may also play a role. For example, could the joy of winning in the first task generate a good mood, which in turn could improve self-perception? In fact, mood could not explain why we found an asymmetric spillover effect after a failure in the first task (such a failure might have induced a bad mood, but competitiveness was not reduced in the second task). Another element could come from the revision of aspirations: individuals who won in the first task might be more willing to take the risk of entering the tournament in the second task because they may have revised upward their reference level in terms of status. But while this effect could possibly explain a spillover effect on tournament entry, it should not affect directly self-confidence.

The implications of these findings are mixed. On the positive side, using previous success to build one's confidence may help individuals to increase their self-esteem. On the other side, it may motivate people to compete excessively, based on an erroneous perception of their chances to succeed. This also shows the complexity of designing effective feedback policies, notably for companies that have to manage multi-task work organizations. Indeed, if feedback in one task can help workers to form a more accurate perception of their ability in this task, it may also bias their perceptions about their ability in other tasks, especially after receiving good news.

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## A Appendix

### A.1 Instructions



## **Instructions for the different treatments**

### Introduction (Common for All)

#### **Welcome!**

Thank you all for taking the time to come today. Today's session will take less than two hours. Before we begin, I want to make some general comments about what we are doing here today and explain the rules that you must follow.

You have each received an anonymous identification number. At some point, you will interact with other participants: you will never know their identity or their choices. Similarly, the other participants will never know your identity and your choices. All your choices and responses are anonymous.

The session consists of several tasks. At the end of the session, one of these tasks will be randomly selected to determine your earnings in this experiment. Therefore, each task may count for determining your earnings. The method we use to determine your earnings varies across tasks. Before each task we will describe in detail how your payment is determined.

Whatever money you earn in the session will be yours to keep and take home. In addition to the money you earn in the session, we will pay you **Rs. 100 for your participation today**. Your earnings will be paid to you in cash and in private at the end of the session.

At the end of the session, you will have to fill out a questionnaire with a list of simple questions. We are about to begin the first task. It is important that you listen as carefully as possible. We will distribute the instructions for the following task at the end of this first part.

If you have any question, please raise your hand and we will answer your questions in private. Please do not ask questions to the other participants or talk about the game with them at any point during today's session. This is very important. Please be sure that you obey this rule.

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### **Instructions for the Baseline Treatment (T0)**

We will describe below the instructions for the tasks.

#### **Task 1. Piece rate**

For Task 1, you will be asked to memorize and report numbers and then, we will ask you some questions.

We will dictate fifteen numbers between 1 and 100. Each number will be dictated twice. After the completion of the dictation, you will be asked to recall as many numbers as you can and then write them down on the response sheet provided to you within 3 minutes. You do not have to write the numbers down in the order in which they were dictated. Just write down as many numbers as you can recall.

**Note that you are not allowed to write anything while the dictation is going on; otherwise you will be excluded from the session. This is an individual task, so it is not permitted to discuss the numbers with any of the other participants. Doing so will also lead to exclusion from the session.**

So you should listen carefully what the numbers are, memorize them and then reproduce as many of these numbers as you can on the response sheet. You cannot write more than 15 numbers (any number that would be reported after the 15th one would not be considered).

We will now play a practice round of this task with only 5 numbers. You will not earn anything from this practice round but please follow the instructions carefully.

*--Practice: please listen to the 5 numbers and report them on your reporting sheet--*

If Task 1 is the one randomly selected for payment, then you get Rs.10 per number you recall correctly in the 3 minutes. For example, if you recall correctly 2 numbers, you will earn  $2 \times 10 = \text{Rs. } 20$ ; if you recall 10 numbers, you will earn  $10 \times 10 = \text{Rs. } 100$ . Your payment does not decrease if you report an

incorrect number.

We refer to this payment as the **piece rate payment**.

If you have any question, please raise your hand and we will answer your question in private.

*--Task 1 will start now. Please listen to the dictated numbers carefully and do not write anything before you are invited to do so. --*

*-- Now, please write down as many of the dictated numbers as you can recall in the next 3 minutes. --*

*-- Three minutes are over. Please stop writing immediately. --*

### **Question 1.1**

*-- Please indicate on your reporting sheet in the box in front of "Question 1.1" how many numbers out of those you have reported you think you have correctly recalled. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score. --*

### **Task 2. Tournament**

As in Task 1, after listening to a series of 15 dictated numbers, you will be given 3 minutes to write down as many recalled numbers as possible (in the limit of 15). However for this task your payment depends on your performance relative to that of a group of other participants.

Each group consists of six people, out of which three are from the General Category and three are from the Scheduled Caste category. Thus, you are in a group with five other people present in this session. You will not know who the five other people in your group are. The composition of your group of six remains the same until you are no longer in a group of six.

If Task 2 is the one randomly selected for payment, then your earnings depend on your number of correct recalls compared to that of the five other people in your group. The two group members who correctly recall the most numbers are the winners. They will receive Rs. 30 each per correct recall, while the four other group members receive no payment. So if you are among the two top performers, then you will earn Rs. 30 for each correct number that you recall in this task

You will not be informed of how you did in the tournament relative to others until all four tasks have been completed. If there are ties the winner will be randomly determined.

We refer to this as the **tournament payment**.

If you have any question, please raise your hand and we will answer your question in private.

*--Task 2 will start now. Please listen to the dictated numbers carefully and do not write anything before you are invited to do so. --*

*-- Now, please write down as many of the dictated numbers as you can recall in the next 3 minutes. --*

*-- Three minutes are over. Please stop writing immediately. --*

*-- **Question 2.1.** Please indicate on your reporting sheet in the box in front of "Question 2.1" how many numbers out of those you have reported you think you have correctly recalled. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score.*

**Question 2.2a.** Please indicate on your reporting sheet in the box in front of “Question 2.2a” which rank, between 1 and 6 you think you have got in Task 2, compared to the five other group members. A rank of 1 means you think you got the highest number of correct recalls in the group and rank 6 means you think you got the lowest number of correct recalls in the group and similar for ranks between 1 and 6. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. –

**Question 2.2b.** Please indicate on your reporting sheet in the box in front of “Question 2.2b” which rank, between 1 and 3 you think you have got in Task 2, compared to the three other group members of your own caste. A rank of 1 means you think you got the highest number of correct recalls within your own caste in your group and rank 3 means you think you got the lowest number of correct recalls within your caste in the group and similar for ranks between 1 and 3. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. –

**Question 2.3.** Please indicate on your reporting sheet in the box in front of “Question 2.3” what chance is that you will be among the top two scorers in your group of six in this Task. Please indicate any number between 0 and 100, with 0 if you are absolutely sure you are not among the top two scorers in your group of six, 100 if you are absolutely sure that you are among the top two scorers, and some number in between 0 and 100 depending on how sure you are of being among the top two scorers. The higher this number, the more confident you are in being among the top two scorers. You will receive a maximum bonus of Rs.50 and a minimum bonus of 0 for answering this question. The more truthful you are in your report, the higher the bonus will be. In other words, your best interest is in truthfully reporting what you think your chances of being among the top two are. If you are interested in knowing how your bonus is calculated, ask us after the study is over.

### **Task 3. Choice**

As in the previous two tasks, after listening to a series of 15 dictated numbers, you will be given 3 minutes to write down as many recalled numbers as possible. However, before that, you will get to choose which of the two previous payment modes you prefer to apply to your performance in Task 3. You can either choose to be paid according to the *piece rate*, or according to the *tournament*.

If Task 3 is randomly selected for payment, then your earnings for this task are determined as follows.

- If you choose the *piece rate* (i.e. the payment mode used in Task 1), you receive Rs. 10 per number correctly recalled.
- If you choose the *tournament* (i.e. the payment mode used in Task 2), your performance in Task 3 will be evaluated relative to the performance of the other five participants of your group in the Task 2 -Tournament. Remember, out of the six people in each group, three are from General Category and three are from Scheduled Caste category. The Task 2-tournament is the one you just completed. If you correctly recall more numbers than four of your other group members in Task 2, then you receive Rs. 30 for each correctly recalled number. You will receive no earnings for this task if you choose the tournament and are not among the two winners. You will not be informed of how you did in the tournament until the end of the session. If there are ties the winner will be randomly determined.

If you have any question, please raise your hand and we will answer your question in private.

--Task 3 will start now.

**Question 3.1.** Please indicate on your reporting sheet which payment scheme you prefer to apply to your performance in Task 3. Strike through the option which you would not like to select and circle the option which you would like to select:

**Example 1:** If you want to be paid according to Piece rate and not according to Tournament, you should enter:

*Piece rate*

*Tournament*

**Example 2:** If you want to be according to Tournament and not according to Piece rate you should enter:

*Piece rate*

*Tournament*

Please select your payment option here:

1. *Piece rate*
2. *Tournament*

Now, please listen to the dictated numbers carefully and do not write anything before you are invited to do so. --

-- Now, please write down as many of the dictated numbers as you can recall in the next 3 minutes. --

-- Three minutes are over. Please stop writing immediately. --

--**Question 3.2.** Please indicate on your reporting sheet in the box in front of “Question 3.2” how many numbers out of those you have reported you think you have correctly recalled. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score.

**Question 3.3a.** Please indicate on your reporting sheet in the box in front of “Question 3.3a” which rank, between 1 for the highest number of correct recalls to 6 for the lowest number of correct recalls, you think you have got in Task 3, compared to the five other group members in Task 2. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. We ask you to answer this question even if you have chosen the piece rate payment mode.

**Question 3.3b.** Please indicate on your reporting sheet in the box in front of “Question 3.3b” which rank, between 1 and 3 you think you have got in Task 2, compared to the three other group members of your own caste. A rank of 1 means you think you got the highest number of correct recalls within your own caste in your group and rank 3 means you think you got the lowest number of correct recalls within your caste in the group and similar for ranks between 1 and 3. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. --

**Question 3.4.** Please indicate on your reporting sheet in the box in front of “Question 3.4” what chance is that you will be among the top two scorers in your group of six in this Task. Please indicate any number between 0 and 100, with 0 if you are absolutely sure you are not among the top two scorers in your group of six, 100 if you are absolutely sure that you are among the top two scorers, and some number in between 0 and 100 depending on how sure you are of being among the top two scorers. The higher this number, the more confident you are in being among the top two scorers. You will receive a maximum bonus of Rs.50 and a minimum bonus of 0 for answering this question. The more truthful you are in your report, the higher the bonus will be. In other words, your best interest is in truthfully reporting what you think your chances of being among the top two are. If you are interested in knowing how your bonus is calculated, ask us after the study is over. We ask you to answer this question even if you have chosen the piece rate payment mode. --

-- We will continue with Task 4 but before that please fill out a short survey. --

#### **Task 4. BiB Choice**

For Task 4 you will be asked to throw as many balls as you can into a bucket.

We will give you fifteen balls and a bucket will be placed at a distance of 3.5 meters. You will be asked to throw each of the fifteen balls into the bucket within 3 minutes. You will perform the task privately, one at a time, but in the presence of one of the experimenters, who will note down your performance.

However, before that, you will get to choose which of the two payment modes you prefer to apply to your performance in Task 4. You can either choose to be paid according to the *piece rate*, or according to the *tournament*.

If Task 4 is randomly selected for payment, then your earnings for this task are determined as follows.

- If you choose the *piece rate* (i.e. the payment mode used in Task 1), you receive Rs. 10 per successful throw.
- If you choose the *tournament* (i.e. the payment mode used in Task 2), your performance in Task 4 will be evaluated relative to the performance of the other five participants of your group. Remember, out of the six people in each group, three are from General Category and three are from Scheduled Caste category. If you successfully throw more balls than four of your other group members, then you receive Rs. 30 for each successful throw. You will receive no earnings for this task if you choose the tournament and are not among the two winners. You will not be informed of how you did in the tournament until the end of the session. If there are ties the winner will be randomly determined.

If you have any question, please raise your hand and we will answer your question in private.

--Task 4 will start now.

**Question 4.1.** Please indicate on your reporting sheet which payment scheme you prefer to apply to your performance in Task 4. Strike through the option which you would not like to select and circle the option which you would like to select:

**Example 1:** If you want to be paid according to Piece rate and not according to Tournament, you should enter:

*Piece rate*

~~*Tournament*~~

**Example 2:** If you want to be according to Tournament and not according to Piece rate you should enter:

~~*Piece rate*~~

*Tournament*

Please select your payment option here:

1. *Piece rate*
2. *Tournament*

--**Question 4.2.** Please indicate on your reporting sheet in the box in front of "Question 4.2" how many balls you think you will have successfully inserted. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score

-- Task 3 will start now. Please prepare yourself to throw each of the 15 balls into the bucket. Your three-minute time starts now. --

-- Three minutes are over. Please stop throwing now and return to your seat. --

**Question 4.3.** Please indicate on your reporting sheet in the box in front of "Question 4.3" which rank, between 1 for the highest number of successful throws to 6 for the lowest number of successful throws, you think you have got in Task 4, compared to the five other group members in Task 5. If this task is

selected for payment, you will receive an additional Rs.50 if your guess is correct. We ask you to answer this question even if you have chosen the piece rate payment mode. –

*Question 4.4. Please indicate on your reporting sheet in the box in front of “Question 4.4” what chance is that you will be among the top two scorers in your group of six in this Task. Please indicate any number between 0 and 100, with 0 if you are absolutely sure you are not among the top two scorers in your group of six, 100 if you are absolutely sure that you are among the top two scorers, and some number in between 0 and 100 depending on how sure you are of being among the top two scorers. The higher this number, the more confident you are in being among the top two scorers. You will receive a maximum bonus of Rs.50 and a minimum bonus of 0 for answering this question. The more truthful you are in your report, the higher the bonus will be. In other words, your best interest is in truthfully reporting what you think your chances of being among the top two are. If you are interested in knowing how your bonus is calculated, ask us after the study is over. We ask you to answer this question even if you have chosen the piece rate payment mode. --*

### **Instructions for Treatment 1 (T1)**

We will describe below the instructions for the tasks.

#### **Task 1. Piece rate**

For Task 1, you will be asked to memorize and report numbers and then, we will ask you some questions.

We will dictate fifteen numbers between 1 and 100. Each number will be dictated twice. After the completion of the dictation, you will be asked to recall as many numbers as you can and then write them down on the response sheet provided to you within 3 minutes. You do not have to write the numbers down in the order in which they were dictated. Just write down as many numbers as you can recall.

Note that **you are not allowed to write anything while the dictation is going on; otherwise you will be excluded from the session. This is an individual task, so it is not permitted to discuss the numbers with any of the other participants. Doing so will also lead to exclusion from the session.** So you should listen carefully what the numbers are, memorize them and then reproduce as many of these numbers as you can on the response sheet. You cannot write more than 15 numbers (any number that would be reported after the 15th one would not be considered).

We will now play a practice round of this task with only 5 numbers. You will not earn anything from this practice round but please follow the instructions carefully.

*--Practice: please listen to the 5 numbers and report them on your reporting sheet--*

If Task 1 is the one randomly selected for payment, then you get Rs.10 per number you recall correctly in the 3 minutes. For example, if you recall correctly 2 numbers, you will earn  $2 \times 10 = \text{Rs. } 20$ ; if you recall 10 numbers, you will earn  $10 \times 10 = \text{Rs. } 100$ . Your payment does not decrease if you report an incorrect number.

We refer to this payment as the **piece rate payment**.

If you have any question, please raise your hand and we will answer your question in private.

*--Task 1 will start now. Please listen to the dictated numbers carefully and do not write anything before you are invited to do so. --*

*-- Now, please write down as many of the dictated numbers as you can recall in the next 3 minutes. --*

-- Three minutes are over. Please stop writing immediately. --

### **Question 1.1**

-- Please indicate on your reporting sheet in the box in front of "Question 1.1" how many numbers out of those you have reported you think you have correctly recalled. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score. --

## **Task 2. Tournament**

As in Task 1, after listening to a series of 15 dictated numbers, you will be given 3 minutes to write down as many recalled numbers as possible (in the limit of 15). However for this task your payment depends on your performance relative to that of a group of other participants.

Each group consists of six people, out of which three are from the General Category and three are from the Scheduled Caste category. Thus, you are in a group with five other people present in this session. You will not know who the five other people in your group are. The composition of your group of six remains the same until you are no longer in a group of six.

If Task 2 is the one randomly selected for payment, then your earnings depend on your number of correct recalls compared to that of the five other people in your group. The two group members who correctly recall the most numbers are the winners. They will receive Rs. 30 each per correct recall, while the four other group members receive no payment. So if you are among the two top performers, then you will earn Rs. 30 for each correct number that you recall in this task

You will not be informed of how you did in the tournament relative to others until all four tasks have been completed. If there are ties the winner will be randomly determined.

We refer to this as the **tournament payment**.

If you have any question, please raise your hand and we will answer your question in private.

--Task 2 will start now. Please listen to the dictated numbers carefully and do not write anything before you are invited to do so. --

-- Now, please write down as many of the dictated numbers as you can recall in the next 3 minutes. --

-- Three minutes are over. Please stop writing immediately. --

**Question 2.1.** Please indicate on your reporting sheet in the box in front of "Question 2.1" how many numbers out of those you have reported you think you have correctly recalled. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score.

**Question 2.2a.** Please indicate on your reporting sheet in the box in front of "Question 2.2a" which rank, between 1 and 6 you think you have got in Task 2, compared to the five other group members. A rank of 1 means you think you got the highest number of correct recalls in the group and rank 6 means you think you got the lowest number of correct recalls in the group and similar for ranks between 1 and 6. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct.

**Question 2.2b.** Please indicate on your reporting sheet in the box in front of "Question 2.2b" which rank, between 1 and 3 you think you have got in Task 2, compared to the three other group members of your own caste. A rank of 1 means you think you got the highest number of correct recalls within your own caste in your group and rank 3 means you think you got the lowest number of correct recalls within your caste in the group and similar for ranks between 1 and 3. If this task is selected for payment, you

will receive an additional Rs.50 if your guess is correct. –

**Question 2.3.** Please indicate on your reporting sheet in the box in front of “Question 2.3” what chance is that you will be among the top two scorers in your group of six in this Task. Please indicate any number between 0 and 100, with 0 if you are absolutely sure you are not among the top two scorers in your group of six, 100 if you are absolutely sure that you are among the top two scorers, and some number in between 0 and 100 depending on how sure you are of being among the top two scorers. The higher this number, the more confident you are in being among the top two scorers. You will receive a maximum bonus of Rs.50 and a minimum bonus of 0 for answering this question. The more truthful you are in your report, the higher the bonus will be. In other words, your best interest is in truthfully reporting what you think your chances of being among the top two are. If you are interested in knowing how your bonus is calculated, ask us after the study is over.

### Task 3. Choice

As in the previous two tasks, after listening to a series of 15 dictated numbers, you will be given 3 minutes to write down as many recalled numbers as possible. However, before that, you will get to choose which of the two previous payment modes you prefer to apply to your performance in Task 3. You can either choose to be paid according to the *piece rate*, or according to the *tournament*.

If Task 3 is randomly selected for payment, then your earnings for this task are determined as follows.

- If you choose the *piece rate* (i.e. the payment mode used in Task 1), you receive Rs. 10 per number correctly recalled.
- If you choose the *tournament* (i.e. the payment mode used in Task 2), your performance in Task 3 will be evaluated relative to the performance of the other five participants of your group in the Task 2 -Tournament. Remember, out of the six people in each group, three are from General Category and three are from Scheduled Caste category. The Task 2-tournament is the one you just completed. If you correctly recall more numbers than four of your other group members in Task 2, then you receive Rs. 30 for each correctly recalled number. You will receive no earnings for this task if you choose the tournament and are not among the two winners. You will not be informed of how you did in the tournament until the end of the session. If there are ties the winner will be randomly determined.

If you have any question, please raise your hand and we will answer your question in private.

--Task 3 will start now.

**Question 3.1.** Please indicate on your reporting sheet which payment scheme you prefer to apply to your performance in Task 3. Strike through the option which you would not like to select and circle the option which you would like to select:

**Example 1:** If you want to be paid according to Piece rate and not according to Tournament, you should enter:

Piece rate  
~~Tournament~~

**Example 2:** If you want to be according to Tournament and not according to Piece rate you should enter:

~~Piece rate~~  
Tournament

Please select your payment option here:

1. *Piece rate*



## 2. Tournament

Now, please listen to the dictated numbers carefully and do not write anything before you are invited to do so. --

-- Now, please write down as many of the dictated numbers as you can recall in the next 3 minutes. --

-- Three minutes are over. Please stop writing immediately. --

--**Question 3.2.** Please indicate on your reporting sheet in the box in front of “Question 3.2” how many numbers out of those you have reported you think you have correctly recalled. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score.

**Question 3.3a.** Please indicate on your reporting sheet in the box in front of “Question 3.3a” which rank, between 1 for the highest number of correct recalls to 6 for the lowest number of correct recalls, you think you have got in Task 3, compared to the five other group members in Task 2. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. We ask you to answer this question even if you have chosen the piece rate payment mode.

**Question 3.3b.** Please indicate on your reporting sheet in the box in front of “Question 3.3b” which rank, between 1 and 3 you think you have got in Task 2, compared to the three other group members of your own caste. A rank of 1 means you think you got the highest number of correct recalls within your own caste in your group and rank 3 means you think you got the lowest number of correct recalls within your caste in the group and similar for ranks between 1 and 3. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. --

**Question 3.4.** Please indicate on your reporting sheet in the box in front of “Question 3.4” what chance is that you will be among the top two scorers in your group of six in this Task. Please indicate any number between 0 and 100, with 0 if you are absolutely sure you are not among the top two scorers in your group of six, 100 if you are absolutely sure that you are among the top two scorers, and some number in between 0 and 100 depending on how sure you are of being among the top two scorers. The higher this number, the more confident you are in being among the top two scorers. You will receive a maximum bonus of Rs.50 and a minimum bonus of 0 for answering this question. The more truthful you are in your report, the higher the bonus will be. In other words, your best interest is in truthfully reporting what you think your chances of being among the top two are. If you are interested in knowing how your bonus is calculated, ask us after the study is over. We ask you to answer this question even if you have chosen the piece rate payment mode. --

-- We will now collect your response sheet and evaluate if you are among the two winners in your group for Task 2. In the meantime, please fill out a short survey. --

-- We will now privately hand out a feedback slip. The slip has your identity number and announces whether you are a winner or a non-winner. Please keep the announcement confidential. --

### Task 4. BiB Choice

For Task 4 you will be asked to throw as many balls as you can into a bucket.

We will give you fifteen balls and a bucket will be placed at a distance of 3.5 meters. You will be asked to throw each of the fifteen balls into the bucket within 3 minutes. You will perform the task privately, one at a time, but in the presence of one of the experimenters, who will note down your performance.

However, before that, you will get to choose which of the two payment modes you prefer to apply to your performance in Task 4. You can either choose to be paid according to the *piece rate*, or according to the *tournament*.

If Task 4 is randomly selected for payment, then your earnings for this task are determined as follows.

- If you choose the *piece rate* (i.e. the payment mode used in Task 1), you receive Rs. 10 per successful throw.

- If you choose the *tournament* (i.e. the payment mode used in Task 2), your performance in Task 4 will be evaluated relative to the performance of the other five participants of your group. Remember, out of the six people in each group, three are from General Category and three are from Scheduled Caste category. If you successfully throw more balls than four of your other group members, then you receive Rs. 30 for each successful throw. You will receive no earnings for this task if you choose the tournament and are not among the two winners. You will not be informed of how you did in the tournament until the end of the session. If there are ties the winner will be randomly determined.

If you have any question, please raise your hand and we will answer your question in private.

--Task 4 will start now.

**Question 4.1.** Please indicate on your reporting sheet which payment scheme you prefer to apply to your performance in Task 4. Strike through the option which you would not like to select and circle the option which you would like to select:

**Example 1:** If you want to be paid according to Piece rate and not according to Tournament, you should enter:

Piece rate

~~Tournament~~

**Example 2:** If you want to be according to Tournament and not according to Piece rate you should enter:

~~Piece rate~~

Tournament

Please select your payment option here:

1. Piece rate
2. Tournament

--**Question 4.2.** Please indicate on your reporting sheet in the box in front of "Question 4.2" how many balls you think you will have successfully inserted. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score

-- Task 3 will start now. Please prepare yourself to throw each of the 15 balls into the bucket. Your three-minute time starts now. --

-- Three minutes are over. Please stop throwing now and return to your seat. --

**Question 4.3.** Please indicate on your reporting sheet in the box in front of "Question 4.3" which rank, between 1 for the highest number of successful throws to 6 for the lowest number of successful throws, you think you have got in Task 4, compared to the five other group members in Task 5. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. We ask you to answer this question even if you have chosen the piece rate payment mode. –

**Question 4.4.** Please indicate on your reporting sheet in the box in front of "Question 4.4" what chance is that you will be among the top two scorers in your group of six in this Task. Please indicate any number between 0 and 100, with 0 if you are absolutely sure you are not among the top two scorers in your group of six, 100 if you are absolutely sure that you are among the top two scorers, and some number in between 0 and 100 depending on how sure you are of being among the top two scorers. The higher this number, the more confident you are in being among the top two scorers. You will receive a maximum bonus of Rs.50 and a minimum bonus of 0 for answering this question. The more truthful you are in your report, the higher the bonus will be. In other words, your best interest is in truthfully reporting what you think your chances of being among the top two are. If you are interested in knowing how your bonus is calculated, ask us after the study is over. We ask you to answer this question even if

*you have chosen the piece rate payment mode. --*

### **Instructions for Treatment 2 (T2)**

We will describe below the instructions for the tasks.

#### **Task 1. Piece rate**

For Task 1, you will be asked to memorize and report numbers and then, we will ask you some questions.

We will dictate fifteen numbers between 1 and 100. Each number will be dictated twice. After the completion of the dictation, you will be asked to recall as many numbers as you can and then write them down on the response sheet provided to you within 3 minutes. You do not have to write the numbers down in the order in which they were dictated. Just write down as many numbers as you can recall.

Note that **you are not allowed to write anything while the dictation is going on; otherwise you will be excluded from the session. This is an individual task, so it is not permitted to discuss the numbers with any of the other participants. Doing so will also lead to exclusion from the session.** So you should listen carefully what the numbers are, memorize them and then reproduce as many of these numbers as you can on the response sheet. You cannot write more than 15 numbers (any number that would be reported after the 15th one would not be considered).

We will now play a practice round of this task with only 5 numbers. You will not earn anything from this practice round but please follow the instructions carefully.

*--Practice: please listen to the 5 numbers and report them on your reporting sheet--*

If Task 1 is the one randomly selected for payment, then you get Rs.10 per number you recall correctly in the 3 minutes. For example, if you recall correctly 2 numbers, you will earn  $2 \times 10 = \text{Rs. } 20$ ; if you recall 10 numbers, you will earn  $10 \times 10 = \text{Rs. } 100$ . Your payment does not decrease if you report an incorrect number.

We refer to this payment as the **piece rate payment**.

If you have any question, please raise your hand and we will answer your question in private.

*--Task 1 will start now. Please listen to the dictated numbers carefully and do not write anything before you are invited to do so. --*

*-- Now, please write down as many of the dictated numbers as you can recall in the next 3 minutes. --*

*-- Three minutes are over. Please stop writing immediately. --*

#### **Question 1.1**

*-- Please indicate on your reporting sheet in the box in front of "Question 1.1" how many numbers out of those you have reported you think you have correctly recalled. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score. --*

#### **Task 2. Quota-Tournament**

As in Task 1, after listening to a series of 15 dictated numbers, you will be given 3 minutes to write down as many recalled numbers as possible (in the limit of 15). However, for this task your payment depends on your performance relative to that of a group of other participants through a method called **Quota-Tournament**.

Before proceeding, we explain the rules of the **Quota-Tournament**.

Each group consists of six people, out of which three are from the General Category and three are from the Scheduled Caste category. Thus, you are in a group with five other people present in this session. You will not know who the five other people in your group are. The composition of your group of six remains the same until you are no longer in a group of six. In Quota-Tournament the winners are determined as follows:

- *If you belong to the Scheduled Caste category:* you are a winner and receive Rs. 30 for each correctly recalled number if you have a better Task 2 - performance than (i) the other two participants from the Scheduled Caste category in your group in Task 2, **or** (ii) at least four members of your group in Task 2. If you are not a winner, then you do not earn anything.
- *If you belong to the General category:* you receive Rs. 30 for each correctly recalled number if you have a better Task 2 - performance than (i) the other two participants from the General category in your group in Task 2, **and** (ii) four members of your group in Task 2. If you are not a winner, then you do not earn anything.

You will not be informed of how you did in the tournament until the end of the session. If there are ties, the winner will be randomly determined.

*--Task 2 will start now. Please listen to the dictated numbers carefully and do not write anything before you are invited to do so. --*

*-- Now, please write down as many of the dictated numbers as you can recall in the next 3 minutes. --*

*-- Three minutes are over. Please stop writing immediately. --*

**Question 2.1.** *Please indicate on your reporting sheet in the box in front of “Question 2.1” how many numbers out of those you have reported you think you have correctly recalled. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score.*

**Question 2.2a.** *Please indicate on your reporting sheet in the box in front of “Question 2.2a” which rank, between 1 and 6 you think you have got in Task 2, compared to the five other group members. A rank of 1 means you think you got the highest number of correct recalls in the group and rank 6 means you think you got the lowest number of correct recalls in the group and similar for ranks between 1 and 6. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct.*

**Question 2.2b.** *Please indicate on your reporting sheet in the box in front of “Question 2.2b” which rank, between 1 and 3 you think you have got in Task 2, compared to the three other group members of your own caste. A rank of 1 means you think you got the highest number of correct recalls within your own caste in your group and rank 3 means you think you got the lowest number of correct recalls within your caste in the group and similar for ranks between 1 and 3. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. –*

**Question 2.3.** *Please indicate on your reporting sheet in the box in front of “Question 2.3” what chance is that you will be among the top two scorers in your group of six in this Task. Please indicate any number between 0 and 100, with 0 if you are absolutely sure you are not among the top two scorers in your group of six, 100 if you are absolutely sure that you are among the top two scorers, and some number in between 0 and 100 depending on how sure you are of being among the top two scorers. The higher this number, the more confident you are in being among the top two scorers. You will receive a maximum bonus of Rs.50 and a minimum bonus of 0 for answering this question. The more truthful you are in your report, the higher the bonus will be. In other words, your best interest is in truthfully reporting what you think your chances of being among the top two are. If you are interested in knowing how your bonus is calculated, ask us after the study is over.*

### **Task 3. Choice**

As in the previous two tasks, after listening to a series of 15 dictated numbers, you will be given 3

minutes to write down as many recalled numbers as possible. However, before that, you will get to choose which of the two previous payment modes you prefer to apply to your performance in Task 3. You can either choose to be paid according to the *piece rate*, or according to the *quota-tournament*.

If Task 3 is randomly selected for payment, then your earnings for this task are determined as follows.

- If you choose the *piece rate* (i.e. the payment mode used in Task 1), you receive Rs. 10 per number correctly recalled.
- If you choose the *Quota-tournament*, your performance in Task 3 will be evaluated relative to the performance of the other five participants of your group in the Task 2.
  - \* *If you belong to the Scheduled Caste category*: you receive Rs. 30 for each correctly recalled number if you are a winner i.e. you have a better Task 3-performance than (i) the other two participants from the Scheduled Caste category in your group in Task 2, **or** (ii) four members of your group in Task 2. If you are not a winner, then you do not earn anything.
  - \* *If you belong to the General category*: you receive Rs. 30 for each correctly recalled number if you are a winner i.e. you have a better Task 3- performance than (i) the other two participants from the General category in your group in Task 2, **and** (ii) four members of your group in Task 2. If you are not a winner, then you do not earn anything.

You will not be informed of how you did in the tournament until the end of the session. If there are ties the winner will be randomly determined.

If you have any question, please raise your hand and we will answer your question in private.

--Task 3 will start now.

**Question 3.1.** Please indicate on your reporting sheet which payment scheme you prefer to apply to your performance in Task 3. Strike through the option which you would not like to select and circle the option which you would like to select:

**Example 1:** If you want to be paid according to Piece rate and not according to Tournament, you should enter:

*Piece rate*  
~~*Tournament*~~

**Example 2:** If you want to be according to Tournament and not according to Piece rate you should enter:

~~*Piece rate*~~  
*Tournament*

Please select your payment option here:

1. *Piece rate*
2. *Quota-Tournament*

*Now, please listen to the dictated numbers carefully and do not write anything before you are invited to do so. --*

*-- Now, please write down as many of the dictated numbers as you can recall in the next 3 minutes. --*

*-- Three minutes are over. Please stop writing immediately. --*

**--Question 3.2.** Please indicate on your reporting sheet in the box in front of “Question 3.2” how many numbers out of those you have reported you think you have correctly recalled. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score.

**Question 3.3a.** Please indicate on your reporting sheet in the box in front of “Question 3.3a” which rank, between 1 for the highest number of correct recalls to 6 for the lowest number of correct recalls,

you think you have got in Task 3, compared to the five other group members in Task 2. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. We ask you to answer this question even if you have chosen the piece rate payment mode.

**Question 3.3b.** Please indicate on your reporting sheet in the box in front of “Question 3.3b” which rank, between 1 and 3 you think you have got in Task 2, compared to the three other group members of your own caste. A rank of 1 means you think you got the highest number of correct recalls within your own caste in your group and rank 3 means you think you got the lowest number of correct recalls within your caste in the group and similar for ranks between 1 and 3. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. – –

**Question 3.4.** Please indicate on your reporting sheet in the box in front of “Question 3.4” what chance is that you will be among the top two scorers in your group of six in this Task. Please indicate any number between 0 and 100, with 0 if you are absolutely sure you are not among the top two scorers in your group of six, 100 if you are absolutely sure that you are among the top two scorers, and some number in between 0 and 100 depending on how sure you are of being among the top two scorers. The higher this number, the more confident you are in being among the top two scorers. You will receive a maximum bonus of Rs.50 and a minimum bonus of 0 for answering this question. The more truthful you are in your report, the higher the bonus will be. In other words, your best interest is in truthfully reporting what you think your chances of being among the top two are. If you are interested in knowing how your bonus is calculated, ask us after the study is over. We ask you to answer this question even if you have chosen the piece rate payment mode. –

-- We will now collect your response sheet and evaluate if you are among the two winners in your group for Task 2. In the meantime, please fill out a short survey. --

-- We will now privately hand out a feedback slip. The slip has your identity number and announces whether you are a winner or a non-winner. Please keep the announcement confidential. –

#### **Task 4. BiB Choice**

For Task 4 you will be asked to throw as many balls as you can into a bucket.

We will give you fifteen balls and a bucket will be placed at a distance of 3.5 meters. You will be asked to throw each of the fifteen balls into the bucket within 3 minutes. You will perform the task privately, one at a time, but in the presence of one of the experimenters, who will note down your performance.

However, before that, you will get to choose which of the two payment modes you prefer to apply to your performance in Task 4. You can either choose to be paid according to the *piece rate*, or according to the *tournament*.

If Task 4 is randomly selected for payment, then your earnings for this task are determined as follows.

- If you choose the *piece rate* (i.e. the payment mode used in Task 1), you receive Rs. 10 per successful throw.
- If you choose the *tournament* (note this is different from Quota-Tournament used in Task 2), your performance in Task 4 will be evaluated relative to the performance of the other five participants of your group. Remember, out of the six people in each group, three are from General Category and three are from Scheduled Caste category. If you successfully throw more balls than four of your other group members, then you receive Rs. 30 for each successful throw. You will receive no earnings for this task if you choose the tournament and are not among the two winners. You will not be informed of how you did in the tournament until the end of the session. If there are ties the winner will be randomly determined.

If you have any question, please raise your hand and we will answer your question in private.

--Task 4 will start now.

**Question 4.1.** Please indicate on your reporting sheet which payment scheme you prefer to apply to your performance in Task 4. Strike through the option which you would not like to select and circle the option which you would like to select:

**Example 1:** If you want to be paid according to Piece rate and not according to Tournament, you should enter:

Piece rate

~~Tournament~~

**Example 2:** If you want to be according to Tournament and not according to Piece rate you should enter:

~~Piece rate~~

Tournament

Please select your payment option here:

1. Piece rate
2. Tournament

**Question 4.2.** Please indicate on your reporting sheet in the box in front of “Question 4.2” how many balls you think you will have successfully inserted. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score

-- Task 3 will start now. Please prepare yourself to throw each of the 15 balls into the bucket. Your three-minute time starts now. --

-- Three minutes are over. Please stop throwing now and return to your seat. --

**Question 4.3.** Please indicate on your reporting sheet in the box in front of “Question 4.3” which rank, between 1 for the highest number of successful throws to 6 for the lowest number of successful throws, you think you have got in Task 4, compared to the five other group members in Task 5. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. We ask you to answer this question even if you have chosen the piece rate payment mode. –

**Question 4.4.** Please indicate on your reporting sheet in the box in front of “Question 4.4” what chance is that you will be among the top two scorers in your group of six in this Task. Please indicate any number between 0 and 100, with 0 if you are absolutely sure you are not among the top two scorers in your group of six, 100 if you are absolutely sure that you are among the top two scorers, and some number in between 0 and 100 depending on how sure you are of being among the top two scorers. The higher this number, the more confident you are in being among the top two scorers. You will receive a maximum bonus of Rs.50 and a minimum bonus of 0 for answering this question. The more truthful you are in your report, the higher the bonus will be. In other words, your best interest is in truthfully reporting what you think your chances of being among the top two are. If you are interested in knowing how your bonus is calculated, ask us after the study is over. We ask you to answer this question even if you have chosen the piece rate payment mode. --

### **Instruction for Treatment 3 (T3)**

We will describe below the instructions for Task 1.

#### **Task 1. Piece rate**

For Task 1, you will be asked to throw as many balls as you can into a bucket.

We will give you fifteen balls and a bucket will be placed at a distance of 3.5 meters. You will be asked to throw each of the fifteen balls into the bucket within 3 minutes. You will perform the task privately, one at a time, but in the presence of one of the experimenters, who will note down your performance.

**This is an individual task, so it is not permitted to discuss the number of balls you have been able to put in the bucket with any of the other participants. Doing so will also lead to exclusion from the session.**

We will now play a practice round of this task with only 5 balls. You will not earn anything from this practice round but please follow the instructions carefully.

*--Practice: please throw the 5 balls and the experimenter will note down your score.--*

If Task 1 is the one randomly selected for payment, then you get Rs.10 per ball you successfully throw into the bucket. For example, if you successfully throw 2 balls into the bucket, you will earn  $2 \times 10 =$  Rs. 20; if you successfully throw 10 balls, you will earn  $10 \times 10 =$  Rs. 100. Your payment does not decrease if you are unsuccessful in throwing the ball into the bucket.

We refer to this payment as the **piece rate payment**.

If you have any question, please raise your hand and we will answer your question in private.

### **Question 1.1**

*-- Please indicate on your reporting sheet in the box in front of "Question 1.1" how many balls do you think you will successfully insert into the bucket. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score. --*

*--Task 1 will start now. Please prepare yourself to throw each of the 15 balls into the bucket. Your three-minute time starts now. --*

*-- Three minutes are over. Please stop throwing now and return to your seat.—*

### **Task 2. Tournament**

As in Task 1, you will have 15 balls and you will be given 3 minutes to throw as many balls as you can into the bucket. However for this task your payment depends on your performance relative to that of a group of other participants.

Each group consists of six people, out of which three are from the General Category and three are from the Scheduled Caste category. Thus, you are in a group with five other people present in this session. You will not know who the five other people in your group are. The composition of your group of six remains the same until you are no longer in a group of six.

If Task 2 is the one randomly selected for payment, then your earnings depend on your score in the ball-in-bucket game compared to that of the five other people in your group. The two group members who can put the highest number of balls in the bucket are the winners. They will receive Rs. 30 each per successful ball, while the four other group members receive no payment. So if you are among the two top performers, then you will earn Rs. 30 for each successful ball that you recall in this task

You will not be informed of how you did in the tournament relative to others until all four tasks have been completed. If there are ties the winner will be randomly determined.

We refer to this as the **tournament payment**.



If you have any question, please raise your hand and we will answer your question in private.

-- **Question 2.1.** Please indicate on your reporting sheet in the box in front of "Question 2.1" how many balls you think you will successfully insert into the bucket. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score.

-- Task 2 will start now. Please prepare yourself to throw each of the 15 balls into the bucket. Your three-minute time starts now. --

-- Three minutes are over. Please stop throwing now and return to your seat. --

**Question 2.2.** Please indicate on your reporting sheet in the box in front of "Question 2.2" which rank, between 1 and 6 you think you have got in Task 2, compared to the five other group members. A rank of 1 means you think you got the highest number of successful throws in the group and rank 6 means you think you got the lowest number of successful throws in the group and similar for ranks between 1 and 6. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct.

**Question 2.3.** Please indicate on your reporting sheet in the box in front of "Question 2.3" what chance is that you will be among the top two scorers in your group of six in this Task. Please indicate any number between 0 and 100, with 0 if you are absolutely sure you are not among the top two scorers in your group of six, 100 if you are absolutely sure that you are among the top two scorers, and some number in between 0 and 100 depending on how sure you are of being among the top two scorers. The higher this number, the more confident you are in being among the top two scorers. You will receive a maximum bonus of Rs.50 and a minimum bonus of 0 for answering this question. The more truthful you are in your report, the higher the bonus will be. In other words, your best interest is in truthfully reporting what you think your chances of being among the top two are. If you are interested in knowing how your bonus is calculated, ask us after the study is over.

### Task 3. Choice

As in the previous two tasks, you will have 15 balls and you will be given 3 minutes to throw as many balls as you can into the bucket. However, before that, you will get to choose which of the two previous payment modes you prefer to apply to your performance in Task 3. You can either choose to be paid according to the *piece rate*, or according to the *tournament*.

If Task 3 is randomly selected for payment, then your earnings for this task are determined as follows.

- If you choose the *piece rate* (i.e. the payment mode used in Task 1), you receive Rs. 10 per successful throw.
- If you choose the *tournament* (i.e. the payment mode used in Task 2), your performance in Task 3 will be evaluated relative to the performance of the other five participants of your group in the Task 2 -Tournament. Remember, out of the six people in each group, three are from General Category and three are from Scheduled Caste category. The Task 2-tournament is the one you just completed. If you successfully throw more balls than four of your other group members in Task 2, then you receive Rs. 30 for each successful throw. You will receive no earnings for this task if you choose the tournament and are not among the two winners. You will not be informed of how you did in the tournament until the end of the session. If there are ties the winner will be randomly determined.

If you have any question, please raise your hand and we will answer your question in private.

--Task 3 will start now.

**Question 3.1.** Please indicate on your reporting sheet which payment scheme you prefer to apply to your performance in Task 3. Strike through the option which you would not like to select and circle the option which you would like to select:

**Example 1:** If you want to be paid according to Piece rate and not according to Tournament, you should enter:

Piece rate

~~Tournament~~

**Example 2:** If you want to be according to Tournament and not according to Piece rate you should enter:

~~Piece rate~~

Tournament

Please select your payment option here:

1. Piece rate
2. Tournament

**Question 3.2.** Please indicate on your reporting sheet in the box in front of “Question 3.2” how many balls you think you will successfully insert. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score.

-- Task 3 will start now. Please prepare yourself to throw each of the 15 balls into the bucket. Your three-minute time starts now. --

-- Three minutes are over. Please stop throwing now and return to your seat. --

**Question 3.3.** Please indicate on your reporting sheet in the box in front of “Question 3.3” which rank, between 1 for the highest number of successful throws to 6 for the lowest number of successful throws, you think you have got in Task 3, compared to the five other group members in Task 2. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. We ask you to answer this question even if you have chosen the piece rate payment mode. –

**Question 3.4.** Please indicate on your reporting sheet in the box in front of “Question 3.4” what chance is that you will be among the top two scorers in your group of six in this Task. Please indicate any number between 0 and 100, with 0 if you are absolutely sure you are not among the top two scorers in your group of six, 100 if you are absolutely sure that you are among the top two scorers, and some number in between 0 and 100 depending on how sure you are of being among the top two scorers. The higher this number, the more confident you are in being among the top two scorers. You will receive a maximum bonus of Rs.50 and a minimum bonus of 0 for answering this question. The more truthful you are in your report, the higher the bonus will be. In other words, your best interest is in truthfully reporting what you think your chances of being among the top two are. If you are interested in knowing how your bonus is calculated, ask us after the study is over. We ask you to answer this question even if you have chosen the piece rate payment mode. --

-- We will now collect your response sheet and evaluate if you are among the two winners in your group for Task 2. In the meantime, please fill out a short survey. --

-- We will now privately hand out a feedback slip. The slip has your identity number and announces whether you are a winner or a non-winner. Please keep the announcement confidential. –

#### **Task 4. Choice**

As in the previous tasks, you will have 15 balls and you will be given 3 minutes to throw as many balls as you can into the bucket. However, before that, you will get to choose which of the two previous payment modes you prefer to apply to your performance in Task 4. You can either choose to be paid according to the *piece rate*, or according to the *tournament*.

If Task 4 is randomly selected for payment, then your earnings for this task are determined as follows.

- If you choose the *piece rate* (i.e. the payment mode used in Task 1), you receive Rs. 10 per

successful throw.

- If you choose the *tournament* (i.e. the payment mode used in Task 2), your performance in Task 4 will be evaluated relative to the performance of the other five participants of your group. Remember, out of the six people in each group, three are from General Category and three are from Scheduled Caste category. If you successfully throw more balls than four of your other group members, then you receive Rs. 30 for each successful throw. You will receive no earnings for this task if you choose the tournament and are not among the two winners. You will not be informed of how you did in the tournament until the end of the session. If there are ties the winner will be randomly determined.

If you have any question, please raise your hand and we will answer your question in private.

--Task 4 will start now.

**Question 4.1.** Please indicate on your reporting sheet which payment scheme you prefer to apply to your performance in Task 3. Strike through the option which you would not like to select and circle the option which you would like to select:

**Example 1:** If you want to be paid according to Piece rate and not according to Tournament, you should enter:

Piece rate

~~Tournament~~

**Example 2:** If you want to be according to Tournament and not according to Piece rate you should enter:

~~Piece rate~~

Tournament

Please select your payment option here:

1. ~~Piece rate~~
2. Tournament

--**Question 4.2.** Please indicate on your reporting sheet in the box in front of "Question 4.2" how many balls you think you will successfully insert. If this task is selected for payment, you will receive an additional Rs. 50 if your prediction matches your actual score

-- Task 4 will start now. Please prepare yourself to throw each of the 15 balls into the bucket. Your three-minute time starts now. --

-- Three minutes are over. Please stop throwing now and return to your seat. --

**Question 4.3.** Please indicate on your reporting sheet in the box in front of "Question 4.3" which rank, between 1 for the highest number of successful throws to 6 for the lowest number of successful throws, you think you have got in Task 4. If this task is selected for payment, you will receive an additional Rs.50 if your guess is correct. We ask you to answer this question even if you have chosen the piece rate payment mode. –

**Question 4.4.** Please indicate on your reporting sheet in the box in front of "Question 4.4" what chance is that you will be among the top two scorers in your group of six in this Task. Please indicate any number between 0 and 100, with 0 if you are absolutely sure you are not among the top two scorers in your group of six, 100 if you are absolutely sure that you are among the top two scorers, and some number in between 0 and 100 depending on how sure you are of being among the top two scorers. The higher this number, the more confident you are in being among the top two scorers. You will receive a maximum bonus of Rs.50 and a minimum bonus of 0 for answering this question. The more truthful you are in your report, the higher the bonus will be. In other words, your best interest is in truthfully reporting what you think your chances of being among the top two are. If you are interested in knowing how your bonus is calculated, ask us after the study is over. We ask you to answer this question even if

*you have chosen the piece rate payment mode. --*

### **Task 5 – Investment Task (Common to all treatments)**

At the beginning of this Task you will receive Rs. 100. You are asked to choose how many Rs. (between 0 and 100) you wish to invest in a risky option. The amount that you do not invest is for you to keep.

We will toss a coin at the end of the session.

- If the coin comes up heads, your investment is a success. You earn 3 times the amount invested (plus the amount that you did not invest).
- If the coin comes up tails, your investment is a failure. You earn 0 and lose your investment (you keep only the amount that you did not invest).

**Example 1.** You invest nothing. The coin flip does not affect your earnings for this part. You get the Rs. 100 for sure.

**Example 2.** You invest all of the Rs. 100. If the coin comes up heads, you earn Rs. 300; if it comes up tails, you earn nothing and end up with 0 in this part.

**Example 3.** You invest Rs. 40. If the coin comes up heads, you earn 60 (the amount that you did not invest) + 3 x 40 (the amount you invested) = Rs.180. If the coin lands on tails, you earn Rs. 60 (the amount that you did not invest).

If you have any question, please raise your hand and we will answer your question in private.

**Question 5.1** Please indicate on your reporting sheet how much you are willing to invest (between 0 and 100).

### **Exit Survey (Common for all treatments)**

#### **Demographic questionnaire**

Please answer the following questions. We remind you that your responses are anonymous.

1. What is your age \_\_\_\_\_ years
2. What is your gender? \_ Male / female \_\_\_\_\_
3. Are you married?  YES  NO
4. Do you have children?  YES  NO
  - a. If yes how many? \_\_\_\_\_
  - b. How many of these children are under age 5? \_\_\_\_\_
5. Religion: • Hindu • Muslim • Others
6. If you have a religion, do you pray  
 several times per day  once per day  every week  rarely  
 never
7. Caste: • General • OBC • SC • ST • Others/No Caste
8. Education level:
  - a. Class \_\_\_\_\_ (if passed Class 12 or below)
  - b. Bachelors
  - c. Masters or above



## A.2 Theoretical Framework

Our theoretical framework is inspired by [Bénabou and Tirole \(2002\)](#) and [Bénabou \(2015\)](#). A risk neutral individual has a horizon of three periods: 0, 1 and 2. At  $t=0$ , she performs a task, say task M, for which there are two possible outcomes: success and failure, *i.e.*,  $\sigma \in \{S, F\}$ . At  $t=1$ , she obtains and processes information about her success in task M, updates her prior and decides whether to exert effort  $e$  or not in a completely unrelated task, task B ( $B \perp M$ ),  $e \in \{0, 1\}$ .<sup>18</sup> If she does, then she pays a cost  $ce_i$  but she also gets an anticipatory utility  $sE_1(U_2)$  that is time discounted by  $\delta$ . So, her utility at  $t=1$  is given by  $U_1 = -ce_i + s\delta E_1(U_2)$ . At  $t=2$ , she receives the payoff from her effort,  $U_2$ , where  $U_2 = \theta[\alpha e + (1 - \alpha)k]$ . The final payoff depends on the productivity at task B,  $\theta$ , which can take value  $\theta_S$  or  $\theta_F$ , such that  $\theta_S - \theta_F > 0$ . The structure further implies that a part of the outcome comes from effort while another part comes from an exogenous fixed factor  $k$ , such as age, gender, caste, *etc.*, which may also be state-dependent.<sup>19</sup>

The agent updates her belief at  $t=1$ . The key element here is that the agent can either respond with realism to the feedback received about success or failure in task M at  $t=0$ , or deceive herself. Realism means that she recognizes that the success status in task M has no bearing on the success status in task B, *i.e.*,  $Corr(S_M, S_B) = 0$ . The agent deceives herself when she believes that success in task M has a bearing on success in task B, *i.e.*,  $Corr(S_M, S_B) > 0$ . If  $\sigma = F$ , agent will not self-deceive. The interesting case is to analyze the environment when  $\sigma = S$ . Let  $\lambda \in [0, 1]$  be the equilibrium probability with which the agent responds with realism and  $(1 - \lambda)$  be the probability of being in denial. If  $q$  is the prior that her outcome in task B is  $S$  given  $\sigma = S$ , then the updated posterior is  $q(\lambda) = q/(q + (1 - q)(1 - \lambda))$ . Notice that if  $\lambda = 0$ , *i.e.*, the agent is always in denial, then the posterior  $q(\lambda)$  is the same as prior  $q$ . On the other hand, if the agent is always realistic with  $\lambda = 1$ , then  $q(\lambda) = 1$ . The net gain from adopting the denial strategy is a function of the probability with which the agent responds with realism, *i.e.*,  $U_{0,D} - U_{0,R} = f(\cdot, q(\lambda))$ . Given this structure, [Bénabou \(2015\)](#) shows that there exists a unique fixed point which solves for the equilibrium probability of self-deception. Further, for certain parameter combinations, the net benefit from self-deception is maximum for  $0 < q(\lambda) < 1$ , indicating that it is optimal for the agent to hold a positive probability of self-deception.

Finally, with respect to the fixed factor or “sunk” capital,  $k$ , if it represents some initial endowment that is more valuable in the S state, then  $\partial(U_{0,D} - U_{0,R})/\partial k > 0$ , meaning that the larger is  $k$ , the greater will be the net gain from self-deception ([Bénabou, 2015](#)).

<sup>18</sup>Note,  $e$  could alternatively represent the decision to enter a tournament in the other task (as opposed to a piece-rate scheme).

<sup>19</sup>Prior research shows that in a deeply segmented society such as the Indian one, low caste individuals are severely discriminated against, have lower status in society and receive lower remuneration ([Deshpande, 2011](#)). In our study, the SC subjects may thus have lower self-confidence and hence, a greater need to believe in their ability to succeed, and a higher  $k$  compared to the GC subjects.

With this backdrop, we layout our conjectures regarding self-confidence spillovers in Section 3.

### A.3 Experimental sites: West Bengal and South 24 Paraganas

(a) West Bengal



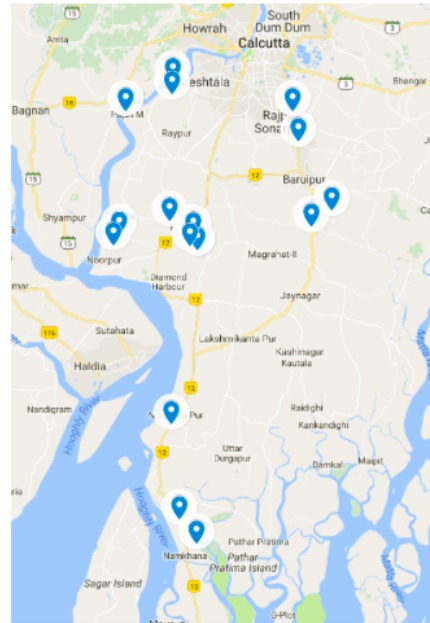
(b) South 24 Paraganas



(c) Blocks within South 24 Paraganas



(d) Sampled Villages and Wards





#### A.4 Pictures of Experimental Sessions



## A.5 Appendix Tables

*Table A1: Summary statistics on the subject-pool*

Demographic variables	Definition	T0	T1	T2	T3
Age	Age	18.87	20.27	19.04	22.27**
Female	1 if female, 0 otherwise	0.49	0.46	0.41**	0.45
SC	1 if caste is OBC, SC, ST; 0 for GC	0.52	0.53	0.53	0.51
Education	Years of education	11.92	12.27	12.28	12.13
Log Family Income	Log of gross monthly family income	8.75	8.55	8.57	8.29**
Risk attitude	Amount invested in the risk game	43.99	44.48	35.57	41.13

*Notes:* The table report mean values for each treatment. \*\* indicate that the comparison between  $T_i$  ( $i=1, 2, 3$ ) and T0 is significant at the 5% level in  $t$ -tests, with errors clustered at the village level.

Table A2: Score in Part 1 and Prediction Errors in Absolute Self-Confidence, by Part and Treatment

Treatment	T0	T1	T2	T3
Score in part 1	8.54	8.01	7.76	5.64
$T_i$ vs. $T_0$	-	-0.53	-0.78**	-2.90**
<i>Absolute self-confidence - Prediction error</i>				
Part 1	1.42	1.43	1.40	1.47
$T_i$ vs. $T_0$	-	0.01	-0.02	0.05
Part 2	1.36	1.33	1.39	1.31
$T_i$ vs. $T_0$	-	-0.03	0.03	-0.05
Part 3	1.38	1.49	1.38	0.62
$T_i$ vs. $T_0$	-	0.11	0.00	-0.76**
Part 4	2.42	1.87	2.35	0.75
$T_i$ vs. $T_0$	-	-0.55	-0.07	-1.58**

Notes: The table displays mean scores in part 1 (for the memory task in T0, T1 and T2 and for the Ball-in-Bucket task in T3) and absolute self-confidence in each part, by treatment. Absolute self-confidence is measured as the number of figures subjects think they recalled correctly in T0 to T2 (alternatively, the number of balls subjects think they will toss in the bucket in T3). Prediction errors are the mean differences between beliefs and the actual numbers of correct recalls or ball tosses. As a total score of 15 can be earned in both tasks, cardinal responses on the self-confidence question are comparable across the memory and BiB task. The table also reports the level of significance of two-sided Mann-Whitney ranksum tests comparing each treatment  $T_i$  (with  $i=1, 2$  or  $3$ ) to  $T_0$ , each subject contributing one independent observation. \*\*  $p < 0.05$ .

Table A3: Relative Self-Confidence, by Part and Treatment

Treatment	T0	T1	T2	T3
<i>Relative self-confidence (belief of being one of the two top scorers)</i>				
Part 2	0.32	0.36	0.39	0.43
<i>T<sub>i</sub> vs. T0</i>	-	<i>0.04</i>	<i>0.07</i>	<i>0.11</i>
Part 3	0.24	0.26	0.35	0.29
<i>T<sub>i</sub> vs. T0</i>	-	<i>0.02</i>	<i>0.11</i>	<i>0.05</i>
Part 4	0.30	0.37	0.40	0.34
<i>T<sub>i</sub> vs. T0</i>	-	<i>0.07</i>	<i>0.10</i>	<i>0.04</i>
<i>Relative self-confidence (percent chance of winning)</i>				
Part 2	56.10	57.04	58.96	59.05
<i>T<sub>i</sub> vs. T0</i>	-	<i>0.94</i>	<i>2.86</i>	<i>2.95</i>
Part 3	56.51	55.83	52.61	50.38
<i>T<sub>i</sub> vs. T0</i>	-	<i>-0.68</i>	<i>-3.90</i>	<i>-6.13</i>
Part 4	51.04	44.99	47.63	46.71
<i>T<sub>i</sub> vs. T0</i>	-	<i>-6.05</i>	<i>-3.41</i>	<i>-4.33</i>

Notes: When relative self-confidence is measured by the belief of being a winner, the values represent the mean proportion of subjects who believe they have rank 1 or 2. The comparisons between treatment T<sub>i</sub> (with i =1, 2 or 3) and the baseline treatment T0 report in italics the absolute difference between the mean values in T<sub>i</sub> and T0.

Table A4: Determinants of Relative Self-Confidence and Tournament Entry in Part 4, By Treatment

Dep. variable	T0		T1		T2		T3	
<i>Being one of the two top scorers</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Winner part 2	0.05 (0.07)	0.03 (0.07)	0.36*** (0.09)	0.32*** (0.07)	0.13 (0.14)	0.15 (0.15)	0.37*** (0.12)	0.33** (0.16)
Indiv. charact.	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>
Nb observations	84	80	96	91	96	95	84	82
Pseudo-R <sup>2</sup>	0.002	0.087	0.095	0.204	0.011	0.010	0.112	0.159

Dep. variable	T0		T1		T2		T3	
<i>% chance of winning</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Winner part 2	0.75 (5.11)	-0.64 (5.00)	26.83*** (3.56)	25.18*** (3.26)	11.72 (7.18)	12.96* (6.60)	24.50*** (4.64)	18.90*** (2.05)
Indiv. charact.	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>
Nb observations	84	80	96	91	96	95	84	82
Pseudo-R <sup>2</sup>	0.001	0.214	0.192	0.252	0.037	0.241	0.194	0.305

Dep. variable	T0		T1		T2		T3	
<i>Tournament entry</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(C)
Winner part 2	0.02 (0.11)	-0.04 (0.11)	0.28*** (0.06)	0.29*** (0.08)	0.39*** (0.11)	0.36*** (0.11)	0.46*** (0.12)	0.48*** (0.14)
Indiv. charact.	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>
Nb observations	84	80	96	91	96	95	84	82
Pseudo-R <sup>2</sup>	0.001	0.116	0.059	0.185	0.118	0.224	0.209	0.212

Notes: Marginal effects are reported. In step 1, all models are linear probability models. Models (1) and (2) consider relative self-confidence as measured by the belief on being among the two top performers in part 4; models (3) and (4) consider relative self-confidence as measured by the chances of being a winner in part 4. In step 2, tournament choice takes value 1 if the subject chooses tournament in part 4 for the BiB task, and 0 otherwise. The models are Probit models. Individual characteristics include: risk score, age, female, education and log of family income. In models with controls for individual characteristics, 12 observations are missing across different sessions (11 missing values for family income and one missing value for education). All standard errors (in parentheses) are clustered at the village level.\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ .

Table A5: Determinants of Relative Self-Confidence and Tournament Entry in Part 4 in the BiB Task (Two-Stage Models)

	(1)	(2)	(3)	(4)
<i>Step 2: Dependent variable: Tournament choice in part 4</i>				
Predicted belief on being a winner	0.86*** (0.04)	0.90*** (0.06)	-	-
Predicted % chances being a winner	-	-	0.01*** ( $< 0.01$ )	0.02*** ( $< 0.01$ )
Individual characteristics	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>
<i>Step 1: Dependent variable:</i>				
	<i>Belief being one of the 2 top scorers in part 4</i>		<i>% chance being a winner in part 4</i>	
Winner in part 2	0.03 (0.07)	-0.02 (0.07)	0.55 (4.92)	-3.29 (5.07)
Treatment T1	-0.02 (0.08)	-0.02 (0.08)	-8.06 (5.19)	-5.29 (5.63)
Treatment T2	-0.01 (0.05)	-0.01 (0.05)	-4.75 (4.10)	-3.65 (3.79)
Treatment T3	-0.13*** (0.04)	-0.10 (0.07)	-11.87*** (3.67)	-6.57 (4.21)
Winner in part 2 * T1	0.23*** (0.09)	0.23*** (0.10)	20.78*** (6.45)	18.06** (8.95)
Winner in part 2 * T2	0.21* (0.11)	0.23** (0.12)	16.34** (7.10)	16.43** (6.44)
Winner in part 2 * T3	0.35*** (0.10)	0.27** (0.10)	25.29*** (6.11)	18.62*** (7.16)
Nb observations	360	348	360	348
Log pseudo-likelihood	-412.09	-376.24	-1864.11	-1777.24
Prob $>\chi^2$	$< 0.001$	$< 0.001$	$< 0.001$	$< 0.001$

Notes: Marginal effects are reported. In step 1, all models are linear probability models. Models (1) and (2) consider relative self-confidence as measured by the belief on being among the two top performers in part 4; models (3) and (4) consider relative self-confidence as measured by the chances of being a winner in part 4. In step 2, tournament choice takes value 1 if the subject chooses tournament in part 4 for the BiB task, and 0 otherwise. The models are Probit models. Individual characteristics include: risk score, age, female, education and log of family income. In models with controls for individual characteristics, 12 observations are missing across different sessions (11 missing values for family income and one missing value for education). All standard errors (in parentheses) are clustered at the village level. \*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ .

## A.6 Appendix Figures

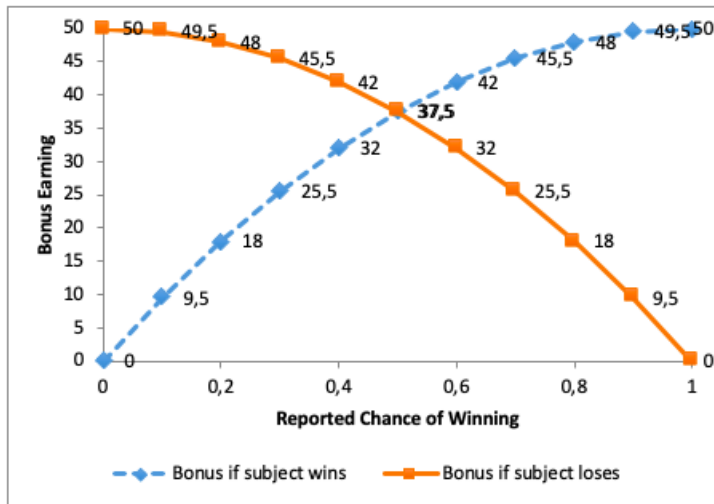


Figure A.1: Proper Scoring Schedule for the Incentivization of Belief Elicitation

Notes: Subjects reported their beliefs about their chance of winning (being among the two top performers). Depending on whether they were actually among the two top performers or not, they received a bonus according to the scoring schedules plotted above. The amounts indicated are in INR. The x-axis represents the reported belief about the chance of winning and the y-axis represents the amount of the bonus.

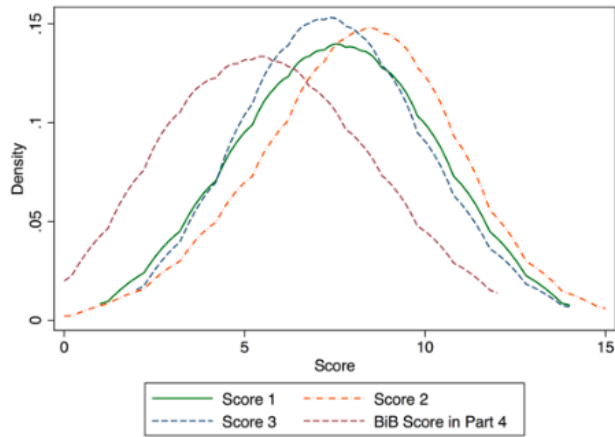


Figure A.2: Distribution of scores in the Ball-in-Bucket task

Notes: BiB for Ball-in-Bucket task. The figure plots the distribution of the scores obtained in parts 1, 2, 3, and 4, namely Score 1, Score 2, Score 3, and Score 4 in the BiB task. The mean scores are 7.51, 8.13, 7.45 and 5.60, respectively.

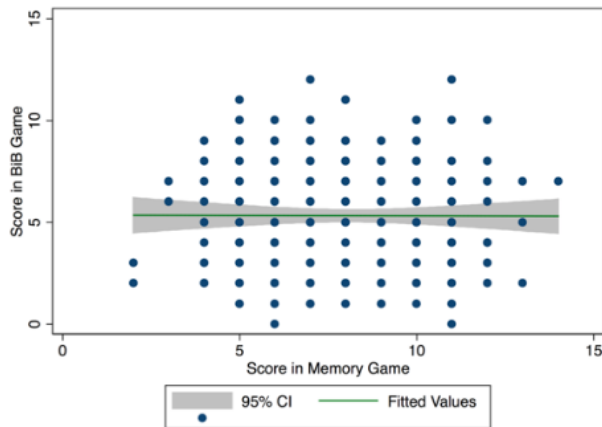


Figure A.3: Scatter plot of score in the Memory task in part 1 and score in the Ball-in-Bucket task in part 4 (pooled treatments T0, T1 and T2)

Notes: The equation of the fitted line is given below. The numbers in the parentheses below the estimates are the corresponding  $p$ -values.

$$\text{Score in BiB Game} = 5.363 - 0.005 * \text{Score in Memory Game}$$

(0.01) (0.945)