PRE-ANALYSIS PLAN FOR

Cultivating an Intergenerational Rights Revolution

Medium-Term Impacts

Introduction.— How are rights revolutions transmitted in societies? What prevents rights revolutions from taking root? We examine if progressive gender attitudes can materialize in a school using a visual narrative (a movie) delivered to teachers and whether combining the visual narrative with a semester-long gender studies course that the teachers then teach compounds the impact on teachers and students, both on gender attitudes and student test scores. We also study if there are cost associated with holding more progressive gender attitudes in terms of stress and domestic violence.

Study Design.— Using a random number generator, we will randomly assign 607 teachers to one of the following treatment arms: (i) utilitarian treatment (121 teachers); (ii) malleability treatment (121 teachers); (iii) visual narrative treatment (122 teachers) (iv) joint visual narrative and gender-rights curriculum treatment (121 teachers) and (v) the control treatment was provided information on procedures to open a bank account in Pakistan (122 teachers). Baseline, midline, and endline surveys are to be conducted every 6 months. We will also cross-randomize teachers to organize students within their classes in mixed-gender or same-gender study groups for their mathematics classes.

Main Treatment Arms.— The Visual Narrative Treatment will involve teachers attending a live screening of a movie: an emotionally-charged, the 2011 movie "Bol" (literally, *to speak up*), an Urdu-language social drama that was part of a maternal and child health project and implemented by Johns Hopkins University. This critically acclaimed movie was one of the highest-grossing Pakistani films of all time. A strong female lead, who is on death row, explains why she found it necessary to murder her father as her "right to exist as a woman" was subverted. The movie explores how she and her sisters deal with her father's obsession with having a son, his perpetuation and strict enforcement of regressive gender norms (such as limiting his daughters' rights to employment, inheritance, education, and public spaces), and his staunch rejection of his existing intersex child. The movie is to be followed by a 30-minute structured discussion on the

movie with application to women's rights and gender attitudes in society. During this discussion, the teachers are to empathize with the strong female character and discussed the movie's portrayal of the gender gap in rights such as education, work, politics, going outside the home and accessing public spaces. The Joint Visual Narrative and Gender-Rights Curriculum Treatment hopes to combine the movie "Bol" with a teacher-training session on how to conduct a semester-long gender-rights course. This is inspired by theory and empirical evidence on the efficacy of social-emotional learning and teaching as an instrument of self-persuasion. In this treatment, the movie is to be followed by a 3-hour workshop on teaching a semester-long course on gender. Finally, we hope to increase equitable gender attitudes by shifting empathy - putting oneself in another's shoes, similar to the ideas of John Rawls. Finally, the control group of teachers will receive training on generic procedures to open a bank account in Pakistan. This will include readily known facts such as going to the bank reception, requesting to open a bank account and presenting identification documents.

Factorial Design.— We will also cross-randomize teachers to form Mixed and Same Gender Study Student Groups in their mathematics classes. Specifically, the teachers will be randomized to form either mixed-gender or same-gender student study groups in their mathematics classes within each treatment arm. The instructions provided to teachers will be to make a group of two-students (that were randomly assigned either to be mixed or of same-gender). The enumerator is to make sure the teachers ensure that students meet once weekly for 30 minutes and discuss any past homework assignments in the assigned group of 2. This is to be done within the mathematics class under teachers' supervision for 3 months before the mathematics final exam.

Empirical Specification.— The impact of the treatments will be evaluated by comparing outcomes across groups in a simple regression framework. For each teacher and student-level outcome, the estimation equations are:

$$Y_i = \alpha + \beta\, U_i + \gamma M_i + \delta\, BM + \omega\, BMC_i + \boldsymbol{X}_i\, \mu + \epsilon_i \qquad (1)$$

where Y_i is the outcome for a teacher i, U_i is a dummy variable equal to one if the teacher is assigned to the utilitarian empathy treatment; M_i is a dummy variable equal to one if the teacher is assigned to the malleability empathy treatment; BM_i is a dummy variable equal to one if the teacher is assigned to the visual narrative (movie "Bol" promoting more equitable gender rights)

treatment and BMC_i if the teacher is assigned to the joint visual narrative and gender-rights curriculum treatment. $\boldsymbol{X}_i$ will be a vector of individual-level teacher and student controls. We will provide results with and without all available controls on teacher and student characteristics as well as averages of our outcomes across the treatment and control groups. The outcome variables will also be standardized to mean zero and standard deviation one.

Outcomes Variables on Gender Attitudes of Teachers. — Our first set of outcome variables concerns teachers' attitudes towards gender rights as assessed in a survey of 16 gender rights questions (Appendix A1 provides the 16 statements). To summarize teachers' gender attitudes, we will use average effect size (AES) approach and construct rights indices based on teachers survey responses. The second set of outcomes involves revealed preference measures of gender attitudes in the form of teachers' willingness to sign and send petitions asking parliament to repeal discriminatory laws. The third outcome is the Implicit Association Test (IAT). We will administer the IAT in Urdu online in oTree. These outcomes will be measured in year 1 and year 2 post-treatment.

Outcomes Variables on Stress. — We will assess stress in two ways. First, we will assess stress in self-reported perception of stress, measured survey questions. Second, we will use pre-breakfast cortisol concentration in blood—the stress hormone excreted in response to stress—to get a more accurate estimate of stress. A large body of literature in neuroscience finds blood cortisol levels are a prominent "biomarker" of stress. Cortisol is released in response to psychological or physiological strain on the body. For instance, it increases following injuries, intense physical exertion, or during public speaking, performing taxing mental arithmetic or enduring unpleasant situations such as waiting in the operation theater before a surgical procedure.[1] These outcomes will also be measured in year 1 and year 2 post-treatment.

Outcomes Variables on Students. — Gender rights index based on 5 survey questions (see Appendix A2 for the survey statements), mathematics test scores and outcomes on strategic dilemmas of cooperation, coordination, redistribution and competitiveness. We will standardize all outcomes to mean zero and standard deviation one.

[1] The outcomes on stress are added one month after the experimental roll-out but before the data collection took place.

Power Analysis.— We conducted a back-of-the-envelope power calculation based on outcomes collected base on a pilot with 35 teachers. The gender rights index computed from the 16 questions on gender was 2.3 on a scale of 5, with higher values representing more progressive gender norms. A single sided power test from a pilot with a mean dependent variable of 2.3 using the treatment groups having 120 observations each against a control group at a power .90 and a standard deviation of .9 shows that a minimum detectable effect would be a change of 0.15 of the standard deviation to detect effect of treatments on gender norms for teachers. We, therefore, plan to conduct the experiment with 5 treatment arms with N'= 600 teachers and N'' =15000 students.

Heterogeneity Analysis.— We will also assess heterogeneity of our treatment effects by (1) those who had previously watched the visual narrative (movie bol) (2) treatment effects by gender of students (3) whether students were in opposite gender or same gender study group in the cross-randomization.

Hypotheses.— We will test the following hypotheses:

H1: Visual narrative presented to teachers increases progressive gender norms of teachers

H2: Visual narrative presented to teachers increases progressive gender norms of students

H3: Visual narrative and curriculum increases progressive gender norms of teachers

H4: Visual narrative and curriculum increases progressive gender norms of students

H5: Visual narrative increases mathematics test scores of students

H6: Visual narrative and curriculum increases mathematics test scores of students

H7: Visual narrative increases mathematics test scores of students in mixed-gender study groups.

H8: Visual narrative and curriculum increases mathematics test scores of students in mixed-gender study groups.

H9: Visual narrative decreases stress.

H10: Visual narrative and curriculum decreases stress.

Appendix A1. Gender Rights Survey for Teachers

Likert Scale:

1. Totally Disagree
2. Disagree
3. Neutral
4. Agree
5. Totally Agree

S1. Women should be allowed to work outside the home.

S2. Women and men should have equal rights to jobs.

S3. I have no problem with my sister or female cousin from working outside the home.

S4. Daughters should have a similar right to inherited property as sons.

S5. Women and men should have equal rights to get an education as men.

S6. Wives should not be less educated than their husbands.

S7. Boys should not get more opportunities and resources for education than girls

S8. It would be a good idea to elect a woman as the village Sarpanch (local politician).

S9. Women and men have equal rights to be President or Prime Minister.

S10. Domestic violence by husbands cannot be justified.

S12. Women should not necessarily get married before her 25th Birthday.

S13. Women who give birth to a son need not be honored in the family.

S14. A woman with five daughters should not be under social pressure to bear a son.

S15. Laws should be passed to ban dowry.

S16. Under Article 35 of the Constitution of Pakistan & Judgment of Federal Shariat Court, the consent of `Wali' is not required and a sui juris Muslim female can enter into a valid Nikah / Marriage under her own freewill without the consent of Wali. How much do you approve of this legal right of women to enter marriage under their own freewill.

Appendix A2. Gender Attitudes Survey for Students

Likert Scale:

1. Totally Disagree
2. Disagree
3. Neutral
4. Agree
5. Totally Agree

S1. I think my mama should be allowed to work outside the home.

S2. Boys and girls should get the same opportunities to study.

S3. Girls should not be less educated than boys.

S4. Girls like boys can also become pilots.

S5. My mama can be the school principal "headmaster".