

Role Models Among Us: Experimental Evidence on Inspirations and Gender Disparities Set in Stones

Prateek Chandra Bhan, University of Konstanz, prateek.bhan@uni-konstanz.de

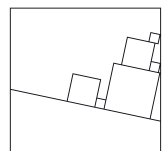
Jinglin Wen, University of York, jinglin.wen@york.ac.uk

Working Paper Series of the Cluster “The Politics of Inequality”:

→ <http://inequality.uni.kn/working-papers>

Working papers of the Cluster of Excellence “The Politics of Inequality” serve to disseminate the research results of work in progress prior to publication. Inclusion of a paper in the working paper series does not constitute publication and should not limit publication in any other outlet. The working papers published by the Cluster represent the views of the respective author(s) and not of the Cluster as a whole.

Cluster of Excellence
The Politics of Inequality



About the authors

Prateek Chandra Bhan is a postdoctoral researcher at the University of Konstanz, where he is a member of both the Cluster of Excellence "The Politics of Inequality" and the Department of Economics. He received his doctorate from the University of Glasgow and formerly studied in the University of Bristol and Delhi. His research focuses on the role of mental wellbeing, agency and hope in bettering the lives of children and youth, and its implications on development and inequality.

Jinglin Wen is a research fellow at the Centre for Health Economics of the University of York. He received his PhD in Economics from the University of Glasgow. His research interests include violence, development, and health inequalities. The context of his research has been the UK, the US, India and Germany.

Role models among us: experimental evidence on inspirations and gender disparities set in stones

Prateek Chandra Bhan* and Jinglin Wen‡

July 2024

Abstract

Historical monuments and statues mediate a conversation between the past and present. In this randomised controlled trial, we test the presence of such communications and their consequences. Focusing on a cohort of primary school students in India, we study the role modelling effect of historical statues. Students in the treatment group were exposed to a short virtual tour of otherwise locally present yet then inaccessible statues due to the Covid pandemic. The placebo group watched a video on the same role models, comprising of images of these role models instead of their statue. There was a third pure control group. Immediately after the 6-minute intervention, students watching the treatment video performed better than the placebo and control groups in a memory test. We detect improvements in treated students' academic performance after a month, which are sustained after 6-months. The treatment affects only boys suggesting that the lack of female role models and their statues may attribute to this gender gap in academic performance.

Key Words: Statues, role models, aspirations, education, gender, India

JEL Codes: D10, D90, O15, I25

*The University of Konstanz, Germany. Email: prateek.bhan@uni-konstanz.de

†The University of York, UK. Email: jinglin.wen@york.ac.uk

‡We are grateful to the ASBS research funding to conduct the study and see it to its completion. We thank the team of Muskaan for their support in data collection and activities in the field. We are extremely grateful to the Rajasthan Police and the Traffic Police Department, Government of Rajasthan for their support with the production of the intervention. We are grateful to the numerous researchers across different fields, who exemplified with their work and principles that research is all the more important in the face of adversity and motivated us to adapt and proceed. We express immense gratitude to the participating schools and their teachers, without whom the study would not have completed. We pre-registered the RCT in August 2021 before the intervention and survey data collection (AEARCTR-0008055). Ethical approval was received from the CoSS ethical review board at the University of Glasgow in August 2021 before any online data collection activities began.

1 Introduction

Statues are erected as powerful pedagogical devices to transmit dominant political ideologies (Cohen, 1989; Kelly, 2015); or to serve as highly visible and respected symbols of prosperity (Bell, 2008), and in the process paying them a tribute. Often they are associated with adding to the aesthetics of a city/town, maintaining heritage of the people and attracting tourism (Benhamou, 2020). However, statues - as a mnemonic device - have also been identified to aid memory (Bower, 1970; Manuel, 2000) of a particular vision of 'ideal' behaviour. This deserves further scrutiny.

Through a role-modelling effect, statues channel information and influence behaviour by invoking past memories. For instance, portrait statues in ancient Roman society manifest the different roles that were then deemed appropriate for men and women in the society (Davies, 2008). Nevertheless, due to the lack of empirical data¹ and methodological difficulties for comparative studies stemming from culture and context, very limited research has been performed on them, especially in economics. Using an experimental technique and limiting our attention to one city in Rajasthan, we assess these role-modelling effects in the short and medium run on children's academic performance. We also find differences in treatment effects based on gender.

As a part of the research design, we exploit the effect that such statues of prominent individuals can have due to their accomplishments (by achieving high goals they serve as an inspiration to the society, or are at least expected to be by the installers) , visible grandeur (aesthetics and being entertaining to look at or visit), location (geographical accessibility) and by their origin and overall historical significance in the Indian society (being a part of the academic curriculum). In that sense, they cover all the tenets of role-modelling. For this reason, we label any treatment effects that we find as a result of role-modelling. These further our understanding of the role-modelling literature and provide

¹Most of the repositories are archived at a national level and seldom offer a comprehensive account.

a completely new way to look at statues in policy discourses.

We start by identifying these role models and selecting a representative homogeneous sample of primary school children in urban parts of Jaipur - the study location. These students were then randomised at an individual level to three comparable groups at baseline.

Abiding with the then lockdown restrictions we resorted to an online approach towards data collection and intervention delivery, benefiting largely by the support of the school staff. Without revealing the true intention of the study or our research questions, we conducted the experiment online using Qualtrics. To exercise control and ensure a somewhat neutral environment for the study, the baseline, intervention and endline phases were organised as a part of an activity during regular school periods. These were audited by a member of the research team and facilitated by the school teachers. Students filled online questionnaires in the baseline and watched the intervention videos right before filling those questions during the endline phase. The two waves of data collection happened in subsequent weeks.

The intervention consisted of a 6-minute video of four role-models who had a statue in the city. This was a compilation of a 90 seconds video for each. We hired a production team to produce the short film on the role models and their statues. Our main treatment group saw the videos on the statues - a virtual tour. The second (placebo) group saw a video on the same role models that was composed of their images. The third group served as a pure control. The videos had an identical narrative play in the background that was scripted carefully using the principles of the role-modelling and bearing close connections with the stories that the students would be familiar with. This could be because they have read about it as a part of their academic curriculum or heard in childhood stories. We focus the narrative on events during the role model's early years of life and not expose students to very lofty goals. Themes of hope, self-efficacy, hard-work, grit, breaking stereotypes and high aspirations were carefully embedded in these narratives.

A comparison between the treatment and placebo groups with the control group, de-

tected the effect of statues over and above the role modelling effect of these personalities. Using school's administrative data on academic performance we tracked the students for a period of one year and present treatment effects immediately, one month and six months after the intervention.

We find that right after the intervention there was marked improvements in student's effort and career aspirations for public service. Students of the treatment group with a virtual tour of statues had a 0.12 sd higher effect on a memory test. This can be attributed to the additional memory stimulus received by only the statues group. Students of both the treatment and placebo group (with images of role models) increased their aspirations by 0.14 sd.

One month after the treatment, students of the treatment group (statues group) improved their performance in Mathematics and Computer. On an average their scores increased by 0.21 sd and the number of students passing these exams by 0.23 sd. They also recorded an improvement of 0.04 sd in scores and 0.34 sd in passing the exam in social sciences, with no effects on languages (Hindi and English).

After 6 months, treatment group students still performed better on Mathematics and Computer. The number of students passing the exam significantly increased by 0.24 sd. We detect no effects for the placebo group. The effect was driven by boys of the treatment group. We find that boys scored 0.22 sd (immediate), 0.32 sd (1-month) and 0.25 sd (6-months) higher in the memory task, and mathematics and computer exams. These effects are also strongly significant.

Firstly, we contribute to a growing literature that studies role-modelling effects from movies and video clips on education attainment (or *edutainment*) (Bhan, 2020; Riley, 2022), entrepreneurial aspirations (Bjorvatn et al., 2020; Dalton et al., 2021), labour market choices (Ahmed et al., 2022; McKelway, 2019) and youths' behaviour (Kearney and Levine, 2015). Yet, unlike that literature, we focus on the effect of real-life role models set in stones that have been existing for years. Instead of devising highly entertaining tools, we invoke sus-

ceptibility to otherwise invisibly camouflaging stone figures that may be appealing aesthetically, have a limited entertainment quotient. *Inspiration may be lost in the crowd of concrete and buildings, but like a pair of car keys is readily present once you start looking.*

Secondly, this study links to studies focusing on real-life role models as well. For instance, Kipchumba et al. (2021) show that visits from college students in randomly selected treatment schools impact students' aspirations. Porter and Serra (2020) investigate the effect of exposing students enrolled in introductory classes to successful and charismatic women who majored in economics at the same university. The present study also looks into real-life role models made tangible due to their statues. We rely on recalling the content of students' memory rather than the direct interaction with role models. Here the principle mechanism is heightened sense of familiarity. *We constantly draw comparisons from familiar and relevant others (WorldBank, 2014).*

Thirdly, this study also contributes to the literature that examines the role-modelling effect of political leaders on civilians' norm behaviour. Beaman et al. (2009, 2012) find that exposure to female political leaders increases women's aspiration and changes their gender norms. Our intervention video included Indira Gandhi (and three male role models), who is the only female prime minister in the Indian history. We find that all of our effects were largely driven by boys. The lack of female statues, could reinforce stereotypes that did not allow girls to better their performance in STEM. Hence, in this study, we explain some part of the existing gender gap in academics in India using statues as a proxy for histories of social conditioning that did not offer equal amounts of encouragement to young children.

The rest of the paper is structured as follows. In section 2, we talk about the background literature on statues and their perception through a lens of role-modelling. Section 3 presents the research design with details about the intervention and the outcome variables. Section 4 includes our timeline, a description of the data and randomisation, along with the estimation strategy. Results are presented in section 5 and discussed in section 6 that also focuses on the mechanisms. Section 7 concludes.

2 Background

2.1 Statues, legacies and their implications

Statues (and monuments in general) built and installed to be seen and respected, often become invisibly blended into the daily hustle-bustles of people's lives (Marschall, 2017). People may barely pay conscious attention, let alone respect and actively appreciate these statues and their stories. Sometimes they can repel attention and become symbols of dogmas from the past, leading to incidents of desecration, defacing and toppling².

Statues and monuments worldwide have recently become a matter of international debate for what they represent, glorify and communicate in an unspoken manner. For instance, statues of scientists who used unethical methods in the United States received a lot of criticism followed by heated debates: *"statuaries should be reserved for people who deserve our respect — not just for their discoveries, but also for their methods"* (Gould, 2017; Campbell, 2017). A statue may communicate encouragingly to a set of individuals, but at the same time, it may be symbolic of discouragement and disdain. While overall encouraging, they may vary in the extent to which different individuals can associate to (or feel unrelated), be sensitive (insensitive) towards and are in turn be impacted (unfettered) by them.

Ever since the ancient Egyptian (Blackman, 1923) and then the Roman imperial society, portrait statues were used to represent individuals worth emulation (mostly, the rich and powerful), and being regarded as 'role models' for 'the contemporary society' (Davies, 2008). People can have time sensitive attitudes towards them too³. While statues are erected in the present, often their installers do not take into account the preferences of contemporary society or contemplate the associated role-modelling effect. This has led to inconsistencies with what was deemed appropriate several hundred years ago, in the re-

²A few examples can be found from the Black Lives Matter movement. Generally, such episodes surge at times of large scale shifts in sociopolitical contestations and ideological changes (Marschall, 2017).

³On a busy day, while running late for work, it is unlikely that someone would stop to spare 10 seconds to appreciate a statue. However, on a pleasant Sunday, the same statue may be seen in a different light.

cent past and in the present. Also, completely ignored is the how they influence or develop society's attitudes and behaviours.

2.2 Role models among us

Exposure to role models via multimedia channels can influence human behaviour and their aspirations (Bernard et al., 2014; Bhan, 2020; Chong and Ferrara, 2009; Chung, 2000; La Ferrara et al., 2012; Lafortune et al., 2018; Riley, 2022; Dalton et al., 2021). Role models have been found to affect household autonomy, improve academic performance, increase entrepreneurial spirit and savings, raise family incomes, appease gender biases and stereotypes, and foster hope and optimism across developing and developed countries. There is plenty of evidence on their efficacy across different age-brackets too.

Studies with role models have widely used exposure to real life role models (in person and virtually) and fictitious characters (protagonists of films/television series/advertisements). Such interventions aim to offer a blend of information, encouragement and entertainment (in some cases) through an individual (or a group) that the subjects can associate with. Their achievements, often in the face of adversity, serve to instigate feelings of self-confidence, self-efficacy and hopefulness. A complementarity between beliefs about one's abilities and performance is central to their effect on different developmental outcomes (Bénabou and Tirole, 2003; Dalton et al., 2016; Compte and Postlewaite, 2004)

Marking a departure from the standard literature, we explore whether 'statues'⁴ of real life historical icons can instigate a similar effect. As mentioned formerly, public opinion and scientific discourses on the power and weaknesses of statues are mixed and limited. Through a role-modelling lens, we unearth their implications on psychology, academic performance and inequality in the following sections.

⁴The seemingly readily available and easy to access 'role models among us'.

3 Research design

Brocas and Carrillo (2020) argue that studies on children bring their own novel challenges for experimental designs that demand premeditated designs, and methodological adjustments based on the sample and context. Children grasp information, fuel their motivations, and adjust their behaviours in their own ways. For this reason, we adopt a host of measurement tools to collect information on their psychological characteristics and academic performance.

3.1 Sample

The sample consisted of 1571 students from eight schools in urban parts of Jaipur, India. They were selected based on a simple identification strategy that required each school to be co-ed (having both boys and girls), follow a Central Board of Secondary Education (CBSE)⁵ curriculum, have at least 40 students in class 4 and 5 each, and agree to share administrative data on school performance. We limit our attention on students in class 4 and 5 as younger children could lack the necessary comprehension and technical skills to partake in the intervention or the questionnaires. These students were randomised at an individual level to three homogeneous groups (one treatment, one placebo, and one pure control). The schools were approached in April-May 2021 to gather consent.

Given the online nature of the research design and the ongoing remote schooling, information elicitation was purely digital. Nevertheless, we cross-checked the information collected from the surveys on children with the school's administrative records. Appendix Table A1 presents the summary statistics. Our average sample age at baseline is 9.5 years with 42 percent of the sample being girls and half of them in class 4 (and the other half in 5). Students scored at an average level of hope and aspiration levels with respect to the literature (Snyder, 2002; Bhan, 2020). At baseline, 75 percent of the students wanted

⁵National board of education for public and private schools, Government of India.

to enter public services and the average sample scored 5.13 out of a 10 mark memory test. Exam score as a percentage is provided for five subjects including math, computer, english, hindi, and social science. Their mean scores range from 0.82 to 0.86.

3.2 Intervention

As a part of the online RCT, we requested and received assistance from school teachers to ensure that participants pay attention to the videos. In August'21, all the teacher coordinators (1 teacher per class) were trained online to passively facilitate the intervention. During the intervention, students joined a zoom room shared by their corresponding teachers as they would on an average (at that time). When they joined, they were informed that they could participate in an activity and as a part of it, open a link that was shared in the chat box. This contained the link for a Qualtrics survey questionnaire.

In baseline, students received a common link during a similar zoom room organised and audited by the teachers. Since there was no treatment involved, each child received this common link that collected information on baseline covariates and outcomes of interest. Unlike the baseline, there were three distinct links for the endline. Contents of each link were treatment dependent, in so far that they first requested consent, followed by a video in the treatment and placebo groups or no video in the pure control arm, and then survey instruments in the same order as the baseline. Hence, each school organised three different zoom rooms, distinct to each treatment group and carefully 'marked student attendance' at the beginning and towards the end of the session. This step ensured (and to some extent prevented) compliance (overcoming any issues with compliance ex ante). Students that had accidentally joined a group that did not correspond with their treatment status, were asked to leave and join the apt room before rolling out the link. For instance, if a student who belongs to treatment (group 1), entered the room for pure control students (group 3), s/he would be identified during the attendance and asked to join room for group 1.

We hired a production company ('Braille Cam') to produce the intervention videos.

Treatment and placebo videos comprise of a set of four role models, namely, Mahatma Gandhi, Arjuna, Indira Gandhi and Dr. B.R. Ambedkar (appearing in that order in the video). However, in the former, students watch a virtual tour of their statues in the city of Jaipur with a short narrative on their lives⁶. Students in the placebo group⁷ watch a video with the same narrative and duration, but devoid of any statues and instead images of these role models stitched into a short video. The videos were narrated in Hindi, which is the local language of communication⁸. The third group serves as a pure control. Each of the four videos was approximately a minute and half long and was delivered within one session in the local language (Hindi). Kids were exposed to the role-modelling content on individual screens. The intervention was delivered during the period of school closure and lockdown restrictions. As the students were home and no households had siblings in the same class, it is safe to assume that there was a screen per student. Moreover, the governmental guidelines on covid-appropriate-behaviour (CAB) preempted the possibility of friends from different households attending the zoom session together physically.

The group watching the statues video (referred to as the treatment group hereon) differed from the group watching the video composed of the images of these role models (referred to as the placebo group hereon) only in terms of the visual cues that they were exposed to. The two videos shared an identical narrative to specifically disentangle any treatment effects due to the virtual stimulus on children's memory. These role models were carefully selected using a simple identification criteria. First, they should be a part of the children's academic curriculum (and general knowledge or folk-lore) to ensure that the students have some modest levels of familiarity to them. Second and importantly enough, they should have a statue in the urban part of Jaipur. This strategy enabled us to narrow down to four iconic figures in Indian history and mythology. Interestingly and much to

⁶The treatment video is available in English at: <https://www.youtube.com/watch?v=AZ00bAk52Wo>

⁷The placebo video is available in English at: <https://www.youtube.com/watch?v=vFvo60JXu7k>

⁸The original and untranslated version of the videos is available in Hindi at: <https://www.youtube.com/watch?v=YDmnnNhpij4> and <https://www.youtube.com/watch?v=8781e077Rok>

our expected dismay, there was only one statue of a female icon . We discuss this in more detail in section 6.

Mohandas Karmchand Gandhi, popularly known as Mahatma Gandhi worldwide, is a beacon of the strength of non-violence and peace. His video contains elements from his time in South Africa and India, from humble beginnings to becoming the father of the nation through sheer will and perseverance. The key message focuses on having faith in oneself - *“The future depends on what you do today.”*

Arjuna, third son of Pandu, is a popular character from Mahabharata (a Sanskrit epic from ancient India) famous for his archery skills. The video highlights his eagerness to learn and passion to perfect his skills. From practicing archery in the dark to focusing only on his target (*The eye of a wooden fish*) Arjuna excelled. Quoting Dronacharya - Arjuna's teacher - *“... to achieve something, you must focus on it....and concentrate only on your target”*, the video emphasises the significance of goal-setting, focus and hard work.

Indira Gandhi, the iron lady of India, was the first female prime minister of independent India. Central to this video's theme are the emotions of confidence, courage and strength. These echo is a letter from her father (Jawaharlal Nehru - the first prime minister of independent India): *“... Be brave, and all the rest follows. We work in the sun and in the light.”*

Dr. Bhimrao Ramji Ambedkar, was the Minister of Justice and Law and the head of the drafting committee of the Indian Constitution. This narrative is premised on hope, aspirations and grit. Overcoming discrimination and hopelessness at a very young age, B.R. Ambedkar secured a scholarship to earn a doctorate in Economics from Columbia University and became a social reformer. *“They tried to bury me. They did not know that I was a seed.”*

The overarching theme of the intervention video in general and the narrative to be precise, was to showcase the power of grit, hope and resilience in the face of adversity. With a focus on goals, consistent effort and power of will, each narrative delivers a key message,

with the common element of ‘you can do everything that you aim for’.

3.3 Main outcomes

We collected information on two main strands of outcomes of interest, namely psychological/motivational and academic performance. While the former is captured in the short-run using information elicited on a memory task and career aspirations, the latter is tracked over a span of 6 months since the intervention. To do so, we relied on administrative data from schools on exam performance of the students right before the intervention and one and six months afterwards.

Several instruments were employed to measure information on student motivation. Effort -as an objective proxy of motivation- was measured on a cognitive memory test. As a part of the online survey, students were displayed a sequence of five numbers for 10 seconds, which they had to memorise and re-write as an exercise in the subsequent page. This step was repeated thrice to ascribe a total score out of 10 for each student. In the first round there were five two-digit numbers with two empty spots for a mark each. In the second round, there were five two-digit numbers with three empty spots for one marks each. Last round had five three-digit numbers with which they had to reproduce for a mark each.

Information was collected on individual hope and aspirations. We use Children’s Hope Scale (Snyder, 2002) and a generalised aspiration scale (Cecchi et al., 2021) along with a question on children’s career aspirations: ‘What do you want to become when you grow up?’ (Kipchumba et al., 2021). Alongside, we use information from children’s career aspirations to create a dummy variable for whether they wish to go into public sector service or the private sector, solely to capture the effect of the treatment on aspirations bearing in mind the role models and their accomplishments. The intervention’s narrative illustrates how Mahatma Gandhi and Dr. B.R. Ambedkar excelled in academics (Law and Economics, respectively) before serving their nation in a not electoral-way. Indira Gandhi served the society by becoming a politician and the first female prime minister of independent India.

Information on these indicators was collected to identify any immediate boosts to motivation⁹.

For collecting information on students' academic performance, we collected administrative data from schools on examinations conducted in March 2021, September 2021 and March 2022. We compare the treatment effects on individual subjects and across Mathematics and Computer and languages . In addition to assessing the treatment effects on scores, we also analyse the impact on the passing rates by discipline. In the short run, as a part of the survey questionnaire, we collect information on student's math and English language performance using simple math tests and word completion tasks, respectively. Besides examination scores, we use these as proxies for learning levels at baseline for balancing checks. In the former, students answer 10 simple arithmetic questions (suitable to their age group) and receive a score for each. In the latter they are asked to complete 5 incomplete words being rewarded with one point for each correct word formation.

Employing our research design and using these outcome variables, we answer three questions: (i) does exposure to statues motivate students; (ii) do they affect academic performance; and (iii) can they explain disparities in academic performance in India? We answer these one by one in section 5 and 6.

4 Data and estimation strategy

Students of class 4 and 5 from the selected schools were organised to participate in an on-line session. Information on the contents of this session was withheld from them. The sessions -in the form of a regular school period- were organised and communicated to the students by the school teachers. As the session started, the teachers took student attendance.

⁹For information on other pre-registered but unanalysed indicators please refer to the PAP. These include a math test and word-completion task. These are tested to ensure that the sample is balanced on measures of academic performance over and above the secondary data supplied by the schools.

These teachers were trained two weeks in advance and offered a script for that session. By training, scripting and anonymously auditing the session the research team ensured that no details about the experimental design, its intent or the outcome variables is communicated to the students. It was all the more difficult for the teachers to do so, as they or the school administration did not know of it themselves. Following Zizzo (2010), we adopted a non-deceptive obfuscation technique to avoid any potential experimenter demand effects. Neither the teachers nor the school administration knew the actual intent of the experiment or the measurement techniques followed. The RCT was presented as a general study to learn whether students like activity-based learning on online platforms. They then informed the students that it was an activity-based session and shared a link to an online survey questionnaire in the chat window. It was explicitly communicated to the students that their performance will not be graded and that their participation was completely voluntary. Teachers were informed that they should not help the students with any part of the survey and the students were instructed to not seek help from the teachers or their parents¹⁰. Endline surveys were conducted in a similar fashion with the exception of having groups segregated by the treatment assignments. Neither the teachers nor the students had any information on this randomisation.

4.1 Timeline

We administered a baseline survey in August 2021 to track the initial scores on the outcome variables, along with collecting essential information on other confounding factors (including but not limiting to age, gender, type of device used to attend online schools, ethnicity). The respondents to this questionnaire formed the participant pool and were

¹⁰The students were also asked to keep their video on at all times to ensure the latter aspect. While a handful of parents intervened at a few occasions in baseline, it is safe to assume that randomisation balanced it across the different groups. Also at any such instance the teachers warned them instantly and that set example for others and avoided any repetitions of a similar malpractice. Additionally, by design, students were not allowed to chat amongst the participants of the call.

randomised at an individual level.

In the next week, we rolled out the endline survey, of which, the treatment is the first part. We had the videos in-built as part of the online surveys. So any individual who wished to fill the endline survey - if belonging to the treatment or placebo group - had to watch the corresponding video in the beginning. Three types of endline surveys were administered to the participant pool, on the basis of their group assignments. As soon as the participants finished watching the videos, they progressed to the information elicitation tools for the variables of interest.

The online survey captured information on the outcome variables only. Information on student performance in school examinations both before and after the treatment were gathered using administrative records. Each of the two online sessions that included the surveys lasted for approximately 1 hour much alike a regular class would otherwise. The timeline is presented in Figure 1. Starting with a baseline survey in the last week, we conducted the intervention and the endline survey in the beginning of September. All the eight schools had their exams in March 2021, last week of September or early October 2021 and then again in March/April 2022. This allowed us to compare the academic performance of the students belonging to different treatment groups, one- and six-months after the intervention.

It is also important to take note of the fact that the intervention was delivered during the period of school closure and lockdown restriction, ebbing any regular exposure to these centrally located and frequently accessed statues by the students. This unique feature allowed us to re-introduce these statues that the students would usually come across in everyday life, while returning from school or going to visit family or friends. Also, equally important is the fact that lockdown restrictions were eased completely by January '22, allowing students of primary classes to go back to schools. We also assume that this point on, students had an almost pre-covid level of exposure to these statues. However, only the treatment group students were now made susceptible to these iconic landmarks over and

above the equally familiar placebo group students.

After consulting media reports, government announcements and local field workers and head teachers in the sample schools, we updated our timeline to incorporate the lockdown timings for schools as shown in Figure 1. The original figure is available in appendix (Figure A1). In addition, using data from Google Mobility Reports (Google, 2022), we present the trends in mobility activities in parks and outdoor spaces in Jaipur in Figure A2.

As a precautionary measure, the Government of Rajasthan (RajGov) decided to close all schools on 14 March 2020 (The Hindu, 2020a). Later, in response to the first wave of covid-19 cases, the Rajasthan government announced a complete lockdown of the state on 21 March 2020 (The Hindu, 2020b). As shown in the mobility graph, the activity in the outdoor spaces collapsed after implementing the lockdown policy. The lockdown restrictions were partly released in May 2020, yet the schools remained closed (India Today, 2020). Since then, the outdoor activities started to recover. But soon after, with the delta variant spreading rapidly during second wave of covid -19, the RajGov imposed a state-wide lockdown in May 2021 (Business Standard, 2021). Our intervention was conducted at the start of Sep 2021. During the time, the mobility in outdoor spaces were not fully recovered, the schools remained closed, and all teaching activities were delivered online.

Importantly, Covid vaccination for kids was not approved and the Delta variant was leaving children vulnerable to Covid-19 (Rackimuthu et al., 2022; CNN, 2021). Meanwhile, the reported cases of children contracting the virus increased, and experts suggested that parents should be more cautious in India (UNICEF, 2021; Indian express, 2021). Therefore, statues and outdoor spaces were not inaccessible for children, yet school closure and the covid infection concerns ebbed regular exposure to these centrally located and frequently accessed statues by the students. This feature allowed our design to re-introduce these statues that the students would usually come across in everyday life, while returning from school or going to visit family or friends.

Figure 1: Timeline

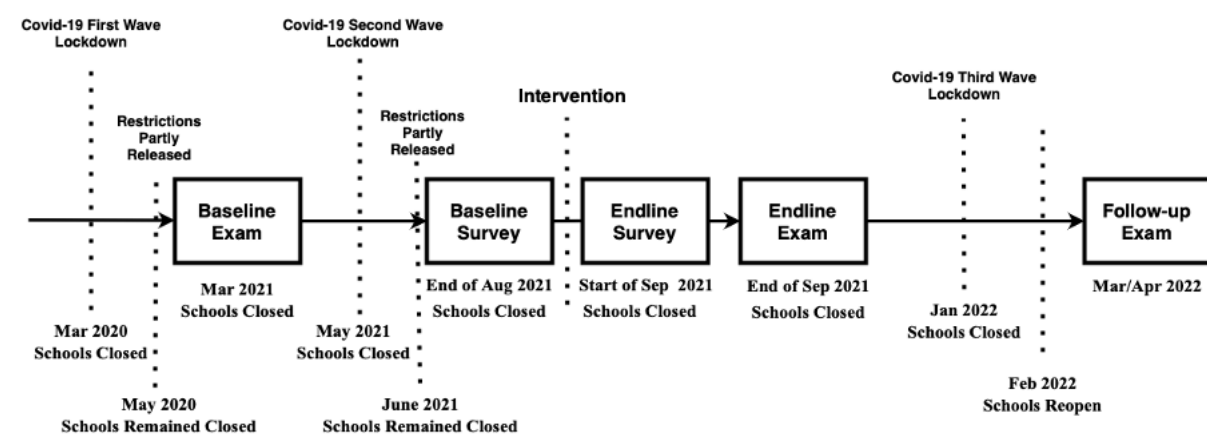


Figure 2: Treatment

Statues	Placebo	Control
Statues -virtual tour	Motivational video	No Intervention
Narrative	Narrative	

Due to the third wave of covid-19 cases, the lockdown was re-imposed in January 2022 for a month. These were eased completely after almost 2 years in February 2022 (ABP, 2022). As suggested in Figure A2, the outdoor activities fully recovered. We assume that this point on, a month before the examinations, students had an almost pre-covid level of exposure to these statues. However, only the statues group students were now more familiar to these iconic landmarks.

4.2 Randomisation and balance

Randomisation -at an individual level- was performed on Microsoft Excel, such that each participating student was assigned uniquely to one of the three groups - treatment, placebo or pure control. The treatment group witnessed a virtual tour to four monumental statues of Jaipur with a short narrative in the background about the individual in that statue; the placebo group watched a video about the same role model that was prepared using images

Table 1: Balance Table

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Statues		Placebo		Control		
	Obs	Mean	Obs	Mean	Obs	Mean	<i>p</i> -value
Female	538	0.42	513	0.41	520	0.42	0.91
Age	538	9.43	513	9.48	520	9.46	0.61
Class 4	538	0.54	513	0.51	520	0.49	0.28
Duration	523	1.15	523	1.44	524	1.15	0.74
Device (Computer)	523	0.23	523	0.23	524	0.23	0.99
Memory Score	491	5.26	482	5.04	488	5.09	0.56
Public Career Aspiration	393	0.74	395	0.76	389	0.75	0.73
Hope	517	24.63	517	24.82	520	25.24	0.19
Aspiration	511	21.39	510	21.28	517	21.04	0.30
Math Score	538	0.85	513	0.85	520	0.84	0.65
Computer Score	396	0.84	375	0.85	388	0.84	0.61
English Score	537	0.82	513	0.83	520	0.81	0.29
Hindi Score	538	0.87	513	0.87	520	0.86	0.28
Social Science Score	458	0.84	428	0.85	446	0.84	0.52

Notes: This table examines whether baseline characteristics and main outcomes are balanced across treatment, placebo, and control groups. Column 7 shows an F-test of equality of the means across the three groups for each characteristic and outcome.

of those role models (but not their statue) with the same narrative as in the first treatment arm. The third group acted as a pure control. The design of treatment allocations is depicted in Figure 2.

As shown in Table 1, the three groups are comparable across a range of baseline characteristics. These include information on confounding factors (like age, gender, or the type of device used), psychological outcomes (hope, aspiration or memory task score) and academic performance parameters across different subjects. Column 7 presents the *p*-values of an F-test of mean equality across the three groups for these different variables. Since these are all insignificant, it is safe to say that the sample is balanced across the treatments. Additionally, as indicated in Appendix Table 6A, attrition rate was also balanced across the three groups. Overall, we had approximately 27% attrition from baseline on an average, which is not surprisingly high for online experiments.

4.3 Empirical strategy

We estimate intent-to-treat (ITT) effects using an ANCOVA specification of the form:

$$Y_{it} = \beta_0 + \beta_1 Statues_i + \beta_2 Placebo_i + Y_{i0} + \varphi X'_{i0} + \varepsilon_i \quad (1)$$

where Y_{it} is the outcome of interest for student i in time t . $Statues_i$ is a binary indicator equal to one if student i is assigned to the statues (treatment) group, $Placebo_i$ is a binary indicator equal to one if student i is assigned to the placebo group. Y_{i0} is the baseline value of the outcome. X'_{i0} is a vector of baseline characteristics for student i such as gender, age, class and among others. ε_i is the error term. Robust standard errors are calculated to allow for heteroskedasticity. β_1 and β_2 coefficients capture the effects of students watching the treatment video and the placebo video only, respectively.

Gender disparities in education attainment have remained deep and persistent in India (World Economic Forum, 2020). We are also interested in identifying the treatment effects by gender as well as the difference in effects between female and male students. Therefore, we estimate the following equation:

$$Y_{it} = \gamma_0 + \gamma_1 Statues_i + \gamma_2 Statues_i \times Female_i + \gamma_3 Placebo_i + \gamma_4 Placebo_i \times Female_i + \gamma_5 Female_i + Y_{i0} + \phi X'_{i0} + \varepsilon_i \quad (2)$$

where $Female_i$ is a binary indicator equal to one if student i is a female student and 0 otherwise. γ_1 measures the statues treatment on male students, while the sum of γ_1 and γ_2 measures the statues treatment on female students, and γ_2 measures the statues treatment on the gap in outcome between female and male students. Similarly, γ_3 measures the placebo effect on male students, the sum of γ_3 and γ_4 the placebo effect on female students and γ_4 the placebo effect on the gender gap in outcome.

In the next section we present our findings for the effects. We assess these effects immediately, 1-month and 6-months after the intervention depending upon the outcome vari-

able and the instrument.

5 Results

5.1 Main findings

A 6-minute treatment video consisting of four prominent Indian role-models had a striking effect on children's memory test. The video consisting of the statues only had an instant memory stimulus and heightened effort in a memory-based number retention task. Alongside, for either of the groups receiving a role-modelling treatment we find an increased aspiration towards public service. Academic performance of the treatment group students increased a month after and the number of students scoring below the passing threshold fell. Effects on the passing rate sustained after six months.

In Table 2, we report results from a survey questionnaire conducted right after the intervention. We find an increase of 0.12 sd in a memory task at 10 percent level of significance only for the treatment group. Aspirations towards a public service oriented career increased for both the groups. The treatment group recorded an increase of 0.14 sd with a slightly lower effect on the placebo group, both of which are significant at 5 percent¹¹. Although the point estimates of the memory test suggest a substantially larger positive reaction to statues videos compared to the placebo videos, we cannot reject that the impacts are equal, with p-values of the test for equality of 0.31 and 0.29 for the specifications excluding and including controls, respectively in Table 2. Similarly, we cannot reject that the effects of statues videos on public service aspiration are the same as for placebo videos. These suggest that some caution is warranted in interpreting the short-term effects of comparing the statues videos with the placebo videos on the memory stimulus and aspirations.

¹¹As students had the freedom to select an option of 'do not know' in the question for aspirations, we score it as missing. Hence, the analysed samples are slightly different across the two variables and in different tables. We generally have higher power in the analysis on the administrative data received from schools.

Table 2: Estimates of the Effect of Statues (Short Term) on memory stimulus and aspirations

	Memory Test		Public Service Aspiration	
	(1)	(2)	(3)	(4)
Statues	0.139** (0.062)	0.119* (0.066)	0.111** (0.056)	0.143** (0.061)
Placebo	0.075 (0.065)	0.052 (0.067)	0.106* (0.055)	0.137** (0.063)
P-value: Statues=Placebo	0.31	0.29	0.92	0.91
Controls	NO	YES	NO	YES
Observations	981	981	790	790

Notes: This table reports estimates of the effect of treatment on students' memory test scores and public career aspiration immediately after the intervention. All outcomes are standardised. Controls include gender, age, class, device used to watch the videos, and the time used to complete the online survey. Heteroskedasticity robust standard errors are reported below point estimates. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Table 3 shows the estimates for the impact of the intervention on the score and the average number of students passing the exam for an aggregated variable of the two STEM subjects (Computer and Mathematics). In Table 4, we show the effects on languages (Hindi and English) and social sciences. We report the effects both 1- and 6-months after in panel (a) and (b), respectively. In Table 3, we find that in the medium run the number of passing students in treatment group increased by 0.23 sd (column 4) with the effect increasing to 0.24 sd after 6 months. Both of these effects are significant at 5%. As in column 2, treatment group students' score increased by 0.21 sd with the effect being strongly significant. Turning to the comparison with the placebo videos, we cannot reject that placebo videos have zero effect on score of math and computer, but neither can we reject that its effect is equal to the statues one, though the impact estimate of the placebo is much smaller compared to that of the statues in columns 1 and 2 of Table 3. However, as shown in columns 3 and 4 of panel (a), we find meaningfully significant and different effects of statues and placebo videos on passing exams after one month, and the estimated effect of placebo videos is very close to 0. For the six-month result, we are marginally able to reject the hypothesis of equal impacts of the statues and placebo videos with a p-value of 11% in the baseline specification in column 3 of Panel B.

Table 3: Estimates of the Effect of Statues on Mean Score of Math and Computer (One/Six-Month)

	Score		Pass	
	(1)	(2)	(3)	(4)
Panel A: One Month				
Statues	0.207*** (0.080)	0.211*** (0.082)	0.218* (0.127)	0.225** (0.114)
Placebo	0.099 (0.089)	0.114 (0.090)	-0.004 (0.160)	0.013 (0.158)
P-value: Statues=Placebo	0.18	0.22	0.08	0.09
Controls	NO	YES	NO	YES
Observations	1,026	1,026	1,026	1,026
Panel B: Six Month				
Statues	0.065 (0.080)	0.091 (0.085)	0.225** (0.099)	0.240** (0.115)
Placebo	0.064 (0.084)	0.096 (0.087)	0.097 (0.133)	0.115 (0.147)
P-value: Statues=Placebo	0.98	0.94	0.11	0.12
Controls	NO	YES	NO	YES
Observations	1,001	1,001	1,001	1,001

Notes: This table reports estimates of the effect of treatment on students' math and computer performance. Panel A reports the effect one month after the intervention, while panel B reports the effect six months after the intervention. The dependent variable is the mean score of math and computer exams in Columns 1 and 2, while the dependent variable is a dummy for whether a student passed the exams in columns 3 and 4. All outcomes are standardised. Controls include gender, age, class, device used to watch the videos, and the time used to complete the endline survey. Heteroskedasticity robust standard errors are reported below point estimates. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***. respectively.

As depicted in Table 4, we do not detect any effect on languages. In column 3 and 4, we find increments of 0.04 and 0.34 sd in the scores and the number of passing students in social sciences. These effects are significant at 5% only in Panel A. As in Panel B, we do not find any significant effect after six months. Fearfulness towards Mathematics is prevalent in students aged 10-15 years (Soni and Kumari, 2017). Mathematics in particular, is also imperative for excelling in academics in that age. We propose that the impression of the role models made students focus courageously on important yet difficult tasks and perform better specifically on Mathematics (and computer). These were messages communicated through the intervention videos. These in turn also validate the presence of a role modelling channel.

5.2 Heterogeneous treatment effects on boys and girls

In order to parse out differential treatment effects between boys and girls, we interact a variable containing that information with that of the treatment status. We find a strong and interesting association between gender and the extent of these effects. Boys and girls, in our sample, were very differently impacted by the intervention. Much in lines with (Lockwood and Kunda, 1997; Lockwood, 2006), we find that lack of female role models disproportionately impacted only the boys in the treatment group. Table 5 shows a negative but insignificant effect on memory task for females in either of the treatment or placebo group. While the treatment group recorded significant improvements, they were completely driven by boys in that group. For the memory task, the overall effect of status treatment for male students is positive and significant 0.22 sd and the status effect for female students is no longer significant (insignificant -0.02). Likewise, the improvements in the passing rates in the treatment group were driven by boys. In Table 3, we find a strong and significant effect of 0.22 sd on passing for Math and Computer after a month. The effect amplified to 0.24 sd after six months. Column 2 and 3 of Table 5's first row show that boys recorded a higher and stronger improvement in passing the exam at 0.32 sd and 0.25

Table 4: Estimates of the Effect of Statues on Language and Social Science (One/Six-Month)

	Language		Social Science	
	Score	Pass	Score	Pass
	(1)	(2)	(3)	(4)
Panel A: One Month				
Statues	0.108 (0.083)	0.191 (0.130)	0.039** (0.016)	0.336** (0.161)
Placebo	0.108 (0.088)	0.089 (0.147)	0.025 (0.017)	0.217 (0.177)
P-value: Statues=Placebo	0.99	0.43	0.35	0.39
Controls	YES	YES	YES	YES
Observations	1051	1051	903	903
Panel B: Six Month				
Statues	0.032 (0.077)	-0.071 (0.095)	0.073 (0.087)	-0.173 (0.106)
Placebo	0.008 (0.086)	-0.180 (0.127)	0.020 (0.093)	-0.186 (0.125)
P-value: Statues=Placebo	0.78	0.38	0.56	0.92
Controls	YES	YES	YES	YES
Observations	1019	1019	879	879

Notes: This table reports estimates of the effect of treatment on the mean score of students' language exams including English and Hindi, and social science exam score. Panel A reports the effect one month after the intervention, while panel B reports the effect six months after the intervention. The dependent variable is exam score in Columns 1 and 3, while the dependent variable is a dummy for whether a student passed the exam in columns 2 and 4. All outcomes are standardised. Controls include gender, age, class, device used to watch the videos, and the time used to complete the endline survey. Heteroskedasticity robust standard errors are reported below point estimates. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***.

sd after one and six months. Although the effect after six months is weakly significant, the effect after a month is significant at 5%.

These results are very important in so far, that they serve as an important starting point to explain the implication of being predominantly surrounded by male role models. Girls, at such a young age, and despite being exposed to a female role model that was depicted as an ambassador of courage and fighting stereotypes, did not do better off. Instead, on an average they had negative, albeit insignificant HTEs in Mathematics and Computer.

While we do not find any effects on motivation, upon performing a heterogeneity analysis we find evidence on the significance of hope. Appendix Table 3 shows that immediately after the treatment we do not have any treatment effect on individual hope, happiness or aspiration. Nonetheless, it is not surprising that these do not change immediately after a “6-minute” intervention video¹².

We find that hope at baseline is a significant predictor of future heterogeneities in treatment effects. Above median hope students had a higher effect on passing a math and computer exam for either of the treatment or placebo groups. In Appendix Table 5, students in the placebo group that were more hopeful at baseline had a significant improvement in their passing rates after a month (0.02 sd). In the treatment group these effects are weakly significant after a month and strongly significant after six months (0.02 sd and 0.03 sd). Hence, hopefulness at baseline is associated with extent of academic improvements in the future. Since both the treatment and placebo groups offer a role-modelling treatment we find these HTEs on both groups. Therefore, motivation and the role of inspiration as a mechanism can not be ruled out.

We find a particularly strong effect on the performance of treatment group students in

¹²The closest findings are in Bhan (2020), where an immediate effect is detected from a half-hour video on protagonists within the same age bracket.

Table 5: Heterogeneity in Treatment Effect by Gender

	Memory Test	Math/Computer Passing	
	Immediate	One-Month	Six-Months
	(1)	(2)	(3)
(A) Statues	0.216** (0.085)	0.317** (0.146)	0.245* (0.147)
(B) Statues * Female	-0.234* (0.124)	-0.211 (0.260)	-0.013 (0.199)
(C) Placebo	0.144 (0.088)	0.236 (0.157)	0.107 (0.200)
(D) Placebo * Female	-0.220* (0.131)	-0.532 (0.347)	0.019 (0.261)
Female	0.112 (0.090)	0.015 (0.225)	0.027 (0.197)
Controls	YES	YES	YES
Observations	981	1026	1001
Overall Treatment Effect			
Female in Statues (A) + (B)	-0.018 (0.085)	0.106 (0.201)	0.232 (0.158)
Female in Placebo (C) + (D)	-0.076 (0.100)	-0.296 (0.309)	0.127 (0.189)

Notes: This table reports estimates of the effect of treatment on students' memory test scores and math/computer passing by student gender. All outcomes are standardised. Controls include age, class, device used to watch the videos, and the time used to complete the endline survey. The bottom panel shows the overall treatment effect for each sub-group. Heteroskedasticity robust standard errors are reported below point estimates. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

STEM subjects¹³, mostly driven by boys¹⁴. Put together, we argue that not only do these statues have an effect on academic performance via role modelling but they also explain the prevalent gender disparities. Exposure to those inspirational tools is positive but not solely. Extending on the concept of relatability within the literature on role-models, we propose that familiarity to role models may not bear inspirational fruits unless individuals are susceptible to them. Moreover, from a general policy standpoint, since girls relate better to female role models, a dearth of those in the form of statues, can inadvertently and inevitably become a source for disparity in the form of inspiration (hope or aspirations) that fuels effort and performance.

Our understanding of the results predicts that girls may experience some tension and anxiety with regards to their role in academics when growing up with surrounded by male role models only. Regular acquaintance with mostly male statues may not stimulate as much motivation (if at all any) vis-a-vis boys. In that situation, these statues may be subtly conveying inspiration that are only interpreted by boys who can relate to them. In many ways, these statues can signal to girls that conformity in the society may even mean not behaving like the other boys or sharing the same aspirations (Davies, 2008). This would require further research by manipulating the treatment across gender and assessing the differences between exposure to same-sex and mixed-sex statues.

¹³A decomposition of these findings for different subjects are presented in Appendix Table 2. In addition of Mathematics and Computer, we also find a weakly significant 0.15 sd effect on English scores for both the treatment and placebo groups. There is no effect on the scores in Hindi although the treatment and placebo videos were delivered in Hindi.

¹⁴A further decomposition of the HTE based on the subjects is presented in Appendix Table 4. As expected, for mathematics and computer the effect is run solely by boys in the treatment group. Heterogeneity based on gender in English scores follows suit. Both the treatment and placebo groups record a higher improvement in the scores of boys. There is no effect on the scores in Hindi.

5.3 Robustness checks

A one-off treatment at an individual level preempts clustering by design. We still estimate equation 1 without and with controls (X_{it}). Apart from controlling baseline characteristics in all the estimates of treatment effects, we perform two robustness checks.

Firstly, we check if the attrition rate is associated with the outcome variables across the treatment groups. In Appendix Table 6B we find an absence of a significant relationship for the two groups. This ensures that the treatment did not relate or affect the rate at which students participated in the endline. Secondly, there is wide variation in the time used to complete the endline survey among participants. To take account of potential compliance issue, we have controlled for the time used to complete the endline survey in the main analysis. As a further robustness check, we examine whether the main results are sensitive to the exclusions of a small number of outliers regarding survey duration. Appendix Table 7 suggests that the magnitude and significance of the estimates is nearly identical through the varying specifications.

6 Discussion

6.1 Short run and long run effects

Statues could function as the repository of memory. They can be instruments that commemorate role models and their inspiring stories, and then motivate students to emulate good deeds. Contrastingly, they may also become a token of gender bias. In the absence of any experimental literature on the relationship between statues and people's aspirations and behaviour, we find encouraging results to motivate further research. Our results are not only of significance for broadening our understanding of statues (and historical monuments) and their role in society but also enhancing the literature on role models.

A memory stimulus and increase in career aspirations that are pro-socially driven for

public service suggest the presence of vicarious effects. These rely on two pillars. First, we invoke familiarity by presenting carefully tailored stories that these role models lived (our narratives). Then, by developing an appeal and susceptibility (only for the treatment group) towards these easily accessible statues in the near future using associative memory (Kahneman, 2011).

The effects after 1-month include an improvement in academic performance (scores and number of students passing the exam) on Mathematics and Computer, and Social Sciences. Improvements in Mathematics and Computer are significant for the treatment group and markedly different from the placebo group. The effects after 6-months mimic these to some extent for the passing rate in Math and Computer. These results are strong, significant and special due to the fact that the treatment was merely a 6-minute video giving a virtual tour.

Whilst selecting role-models for our intervention, one of the primary requirements that limited us in our choice was the presence of a grand statue in urban areas of the city. Surprisingly, we could only find one female statue. We find that statues nonchalantly inject a gender gap in academic performance of our sample. There could be multiple explanations for this finding such as lack of female role models. For instance, much in lines with the literature, females correspond to female role models (Meier et al., 2020; Stout et al., 2011; Lockwood, 2006). A dearth of female role models in our intervention may become a source for disparity in the form of inspiration that fuels effort and performance.

6.2 Potential mechanisms

Aesthetic experiences affect psyche and mood¹⁵, and promote health and well-being by eliciting positive emotional outputs (Mastandrea et al., 2019). Statues are one such subtle aesthetic experience that if conditioned strategically can influence individual motivation

¹⁵For instance, it is a conventional practice in students in India to pray or bow their heads to seek blessings of idols and statues of gods before important events like examinations, sports tournaments or job interviews.

and performance. We employ the concept of role-modelling as the best fit to explore such an influence.

We find that our intervention had an effect on student effort and academic performance. While the intervention tool in itself is a role-modelling video, we scrutinize the constituting pieces of the intervention to explain the mechanisms clearly. In that attempt we unearth two key components that are fundamental for relatability to different role models. As part of the experimental design we manipulate this facet.

Any role-modeling intervention depends if the sample/viewer's can (i) relate to the protagonists and (ii) the level of their goals and the one's attained by the protagonists. Furthermore, yet another and perhaps equally important factor could be the entertainment quotient if the means of delivery is through multimedia. This may include the script, quality of production, among many other things. We delve deeper into the first constituent of relatability or relevance of the role-model. We suggest that it relies on two key constituents, namely familiarity and susceptibility.

Familiarity suggests acquiring or possessing knowledge about the role model. The amount of knowledge may vary depending upon priors and information exposure. This helps individuals assimilate information about themselves and identify the overlapping characteristics with that of the role model. Higher the overlap the more they can relate with the role model. The higher the familiarity, the more characteristics can they explore to examine this overlap (as an automatic process). Familiarity therefore, offers a wider array of aspects of personality traits and life experiences to match between the role models and the subject based on their spectrum of such traits, worldviews and experiences.

Susceptibility, captures a likelihood of being influenced in light of new information or experiences. Within the framework of relatability, the more susceptible an individual is, the more likely s/he is to try and identify the above-mentioned overlaps. Higher susceptibility then corresponds to an increased chance of willingly identified overlaps resulting in higher levels of perceived relevance of the role model (as a deliberative process). Together,

familiarity and susceptibility determine the level at which any subject relates (voluntarily and involuntarily, knowingly and unknowingly, consciously and unconsciously to a role model. This results from the two systems that are automatic and deliberative at work (Kahneman, 2011).

While familiarity offers to determine how relatable a role model will be by expanding the spectrum of traits and experiences, susceptibility warrants the will to identify overlaps out of this set of traits, vignettes and life-experiences. In close conformity, these two are the building blocks of any role-modelling effect along with the goals set and attained by these role models. Duflo (2012) and La Ferrara (2019) argue that exposure to lofty goals may paint a far-fetched and unreal picture to the subjects. In the worst case, they can result in disappointment and frustration with the current circumstances, due to aspiration failure if the aspirations window -between what seems attainable to the subjects and what is attained by the role model- is stretched too much (Ray, 2006).

In this RCT, using statues we maneuver subtle manipulations in these fine-grain constituents within relatability. In the treatment group, we show a virtual tour of four statues to which, the students in the entire sample, already possess some amounts of familiarity. This is because they have learnt about them in the curriculum and to an extent in local folklore and kids' stories. In the placebo group, we replace the statues with images of the same role models. Having attended the virtual tour, students in the treated group are more familiar with the statues and in turn the role models that they embody. Likewise, with the same manipulation, we heighten the susceptibility of the treatment group students to these statues for future. This feature is missing in the placebo or control groups. Lastly, using a meticulously scripted narrative that is played in the background of both the groups' video, we balance the goals-attained by these role models. Placebo and treatment groups hear the same narrative. Role models in both groups are shown to attain the same goals like completing high school to later receive a doctorate; or practicing at night to better aim; among others. By the virtue of this design, students in the treatment group end

up being more familiar and susceptible to the statues and the role models they represent. We argue that this translates into the treatment effects that we discussed in section 5.

We suggest relatability to be our main channel. Although we do not have direct measure of this aspect, we argue that by the virtue of our intervention design and its timing, it is the more plausible channel among other possible ones. Immediately after the intervention, heightened relatability (stemming from higher familiarity and susceptibility) results in improved performance in the treated cohort of students. Two caveats complement this discussion profoundly.

First, up until January, 2022 primary school students in Jaipur had online classes. This ensured limited mobility and contact with the statues. However, this changed when schools were re-opened in February. With the easing of lockdown restrictions students regained complete access to the statues (that only the treatment group students had visited virtually) among every other place of visit. A month before the examinations, only the treated students were more familiar and susceptible to these statues. We justify our results on the premise that the intervention had strong effects immediately after the intervention that lasted after 6 months due to increased familiarity and susceptibility. For any other channel, we would have detected effects on the placebo group too.

Second, 75% of the statues in our treatment were male. It has been established in the literature that female correspond only to female role models, unlike men who respond to role models regardless of their sex. Since, girls relate more to female role models and given the principle drivers of our results reside on the extent of relatability, some HTE should be expected. If it is through increased familiarity and susceptibility that these statues impact the outcomes, they should impact girls less than boys, as the former can relate to them less than the latter. This is what we find. Boys improve in their academic performance significantly more than girls even after six months. However, we practice caution in this inference. As discussed, we cannot rule out the possibility of other factors driving there heterogeneous effects, such as the nature of role models, including but not limiting to their

political predilections or religious connotations, and differences in information processing and brain activation due to the voice over of the narrative. Therefore, we expect increased relatability to be one of the main channels.

Many role-modelling interventions fall short of having a desired effect. Evidence and explanation for this is mixed. Appreciation for context, culture and knowledge of the two fundamentals of relatability and goal-setting have enabled researchers and policy makers to better equip themselves. Complemented with experimental evidence we further this understanding. Surely, more research in this direction will be largely beneficial as one of the key advantage of such interventions is their cost-effectiveness. To highlight this, to produce the intervention we spent a little over 800 GBP.

7 Conclusion

Statues are one of the strongest and loudest expressions of a society/nation's power and pride. These can be in the form of exceptional talents, adventurers, reformers, explorers among many others. Paradoxically, they can also be an immediate source of their vulnerability and incongruity. A peripheral view of the costs and benefits associated with erection of a statue is usually limited to the costs of material and maintenance, and the employment or revenue from tourism they may generate.

A deeper view may also involve their existence benefit for the local community via pride and utility gains (in the form of their aesthetics translating into general well-being). Their option value involves the gains to those who do not directly consume their benefits but may wish to preserve these to reap potential future benefits (Benhamou, 2020). The opportunity cost of having something less aesthetically appealing to replace them can also be taken into consideration. Nevertheless, beyond these, we introduce two distinct constituents to this cost-benefit equation for policy makers.

First, an inspirational role-modelling effect contributes to early child development and

improved human capital accumulation. Such motivational effects can be manifold and we barely scratch the surface by limiting our attention to a sample of primary school children. It would be useful to assess similar effects across other dimensions and in different settings.

Secondly, we show that neutral and well-intentioned installations of statues could bear origins to gender disparities. We employ these predominantly male statues to identify systematic differences in the academic performance of boys and girls at an early age. These could accumulate over the years, complemented adversely by stereotypes about their future performance, career choice and labour market outcomes.

Statues are important commemorative tools that bear aesthetic beauty, historical information and implications on socioeconomic development of the society. They should be harnessed carefully to overcome stereotypes, disparities and foster harmony and development. Statues can inspire and if installed and maintained sensitively, bridge gaps within our society. Our study opens avenues for future research and broadens our understanding of historic monuments and role models.

References

- Ahmed, H., Mahmud, M., Said, F., and Tirmazee, Z. S. (2022). Encouraging female graduates to enter the labor force: Evidence from a role model intervention in pakistan.
- Beaman, L., Chattopadhyay, R., Duflo, E., Pande, R., and Topalova, P. (2009). Powerful women: does exposure reduce bias? *The Quarterly journal of economics*, 124(4):1497–1540.
- Beaman, L., Duflo, E., Pande, R., and Topalova, P. (2012). Female leadership raises aspirations and educational attainment for girls: A policy experiment in india. *science*, 335(6068):582–586.
- Bell, S. (2008). Introduction: Role models in the roman world. *Memoirs of the American Academy in Rome. Supplementary Volumes*, 7:1–39.
- Bénabou, R. and Tirole, J. (2003). Intrinsic and extrinsic motivation. *The review of economic studies*, 70(3):489–520.
- Benhamou, F. (2020). Heritage. In *Handbook of Cultural Economics, Third Edition*. Edward Elgar Publishing.
- Bernard, T., Dercon, S., Orkin, K., Taffesse, A., et al. (2014). *The future in mind: Aspirations and forward-looking behaviour in rural Ethiopia*. Centre for Economic Policy Research London.
- Bhan, P. C. (2020). Do role models increase student hope and effort? evidence from india.
- Bjorvatn, K., Cappelen, A. W., Sekei, L. H., Sørensen, E. Ø., and Tungodden, B. (2020). Teaching through television: Experimental evidence on entrepreneurship education in tanzania. *Management Science*, 66(6):2308–2325.
- Blackman, A. M. (1923). The sun-cult in ancient egypt. *Nature*, 111(2789):499–502.

- Bower, G. H. (1970). Analysis of a mnemonic device: Modern psychology uncovers the powerful components of an ancient system for improving memory. *American Scientist*, 58(5):496–510.
- Brocas, I. and Carrillo, J. D. (2020). Introduction to special issue “understanding cognition and decision making by children.” studying decision-making in children: Challenges and opportunities. *Journal of Economic Behavior & Organization*, 179:777–783.
- Campbell, P. (2017). Statues: an editorial response. *Nature*, 549(7672):334–334.
- Cecchi, F., Garcia, A., Lensink, R., and Wydick, B. (2021). Aspirational hope, dairy farming practices, and milk production: Evidence from a randomized controlled trial in bolivia.
- Chong, A. and Ferrara, E. L. (2009). Television and divorce: Evidence from brazilian novelas. *Journal of the European Economic Association*, 7(2-3):458–468.
- Chung, K.-S. (2000). Role models and arguments for affirmative action. *American Economic Review*, 90(3):640–648.
- Cohen, W. (1989). Symbols of power: statues in nineteenth-century provincial france. *Comparative Studies in Society and History*, 31(3):491–513.
- Compte, O. and Postlewaite, A. (2004). Confidence-enhanced performance. *American Economic Review*, 94(5):1536–1557.
- Dalton, P. S., Ghosal, S., and Mani, A. (2016). Poverty and aspirations failure. *The Economic Journal*, 126(590):165–188.
- Dalton, P. S., Rüschenpöhler, J., Uras, B., and Zia, B. (2021). Curating local knowledge: Experimental evidence from small retailers in indonesia. *Journal of the European Economic Association*, 19(5):2622–2657.
- Davies, G. (2008). Portrait statues as models for gender roles in roman society. *Memoirs of the American Academy in Rome. Supplementary Volumes*, 7:207–220.

- Duflo, E. (2012). Hope as capability. *Duflo, E.(2012) Tanner Lectures on Human Values and the Design of the Fight Against Poverty*, pages 28–52.
- Gould, K. E. (2017). Statues: for those deserving respect. *Nature*, 549(7671):160–160.
- Kahneman, D. (2011). *Thinking, fast and slow*. Macmillan.
- Kearney, M. S. and Levine, P. B. (2015). Media influences on social outcomes: The impact of mtv’s 16 and pregnant on teen childbearing. *American Economic Review*, 105(12):3597–3632.
- Kelly, L. (2015). *Knowledge and power in prehistoric societies: Orality, memory, and the transmission of culture*. Cambridge University Press.
- Kipchumba, E. K., Porter, C., Serra, D., Sulaiman, M., et al. (2021). Influencing youths’ aspirations and gender attitudes through role models: Evidence from somali schools. Technical report.
- La Ferrara, E. (2019). Presidential address: Aspirations, social norms, and development. *Journal of the European Economic Association*, 17(6):1687–1722.
- La Ferrara, E., Chong, A., and Duryea, S. (2012). Soap operas and fertility: Evidence from brazil. *American Economic Journal: Applied Economics*, 4(4):1–31.
- Lafortune, J., Riutort, J., and Tessada, J. (2018). Role models or individual consulting: The impact of personalizing micro-entrepreneurship training. *American Economic Journal: Applied Economics*, 10(4):222–45.
- Lockwood, P. (2006). “someone like me can be successful”: Do college students need same-gender role models? *Psychology of women quarterly*, 30(1):36–46.
- Lockwood, P. and Kunda, Z. (1997). Superstars and me: Predicting the impact of role models on the self. *Journal of personality and social psychology*, 73(1):91.

- Manuel, C. (2000). Mnemonic performances. *The Lancet*, 356(9241):1611.
- Marschall, S. (2017). Targeting statues: monument “vandalism” as an expression of sociopolitical protest in south africa. *African Studies Review*, 60(3):203–219.
- Mastandrea, S., Fagioli, S., and Biasi, V. (2019). Art and psychological well-being: Linking the brain to the aesthetic emotion. *Frontiers in Psychology*, 10:739.
- McKelway, M. (2019). Experimental evidence on the effects of women’s employment. Technical report, Working Paper.
- Meier, K., Niessen-Ruenzi, A., and Ruenzi, S. (2020). The impact of role models on women’s self-selection in competitive environments. *Available at SSRN 3087862*.
- Porter, C. and Serra, D. (2020). Gender differences in the choice of major: The importance of female role models. *American Economic Journal: Applied Economics*, 12(3):226–54.
- Ray, D. (2006). Aspirations, poverty, and economic change. *Understanding poverty*, 1:409–421.
- Riley, E. (2022). Role models in movies: the impact of queen of katwe on students’ educational attainment. *The Review of Economics and Statistics*, pages 1–48.
- Snyder, C. R. (2002). Hope theory: Rainbows in the mind. *Psychological inquiry*, 13(4):249–275.
- Soni, A. and Kumari, S. (2017). The role of parental math anxiety and math attitude in their children’s math achievement. *International Journal of Science and Mathematics Education*, 15(2):331–347.
- Stout, J. G., Dasgupta, N., Hunsinger, M., and McManus, M. A. (2011). Steming the tide: using ingroup experts to inoculate women’s self-concept in science, technology, engineering, and mathematics (stem). *Journal of personality and social psychology*, 100(2):255.

World Economic Forum (2020). Global gender gap report 2020.

WorldBank (2014). *World development report 2015: Mind, society, and behavior*. The World Bank.

Zizzo, D. J. (2010). Experimenter demand effects in economic experiments. *Experimental Economics*, 13(1):75–98.

8 Appendix

8.1 Tables and Figures

Figure A1: Timeline

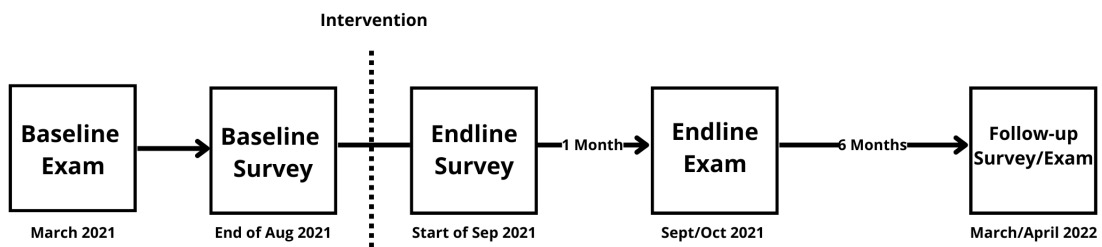
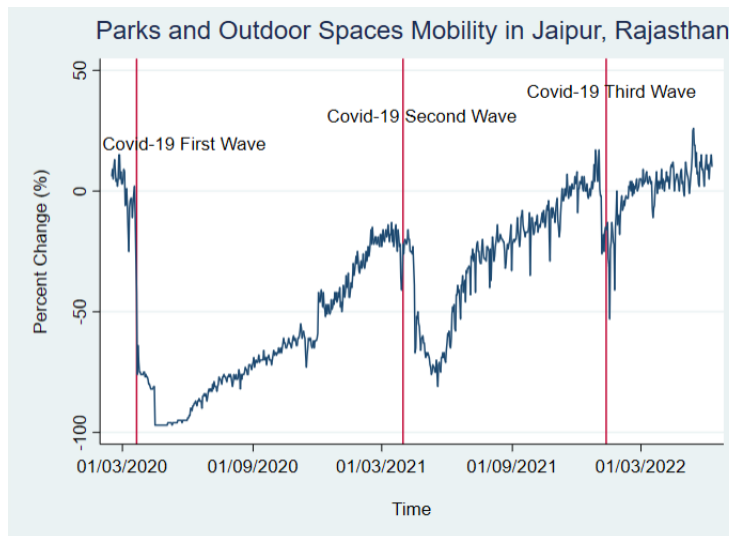


Figure A2: Mobility graph



Appendix Table 1: Summary Statistics

	Label	Observations	Mean	SD	Min	Max
Female	0 - male, 1 - female	1,571	0.42	0.49	0	1
Age	# years	1,571	9.46	0.79	5	12
Class 4	0 - class 5, 1 - class 4	1,571	0.51	0.50	0	1
Duration	# hours	1,570	1.25	7.24	0.07	169.86
Device (Computer)	0 - others, 1 - computer	1,570	0.23	0.42	0	1
Memory Score	0 - 10	1,461	5.13	3.29	0	10
Public Career Aspiration	0 - other, 1 - public career	1,177	0.75	0.44	0	1
Hope	0 - 36	1,554	24.90	5.50	6	36
Aspiration	0 - 24	1,538	21.24	3.75	3	24
Math Score	school exam	1,571	0.84	0.15	0	1
Computer Score	school exam	1,159	0.85	0.16	0	1
English Score	school exam	1,570	0.82	0.16	0	1
Hindi Score	school exam	1,571	0.86	0.14	0	1
Social Science Score	school exam	1,332	0.84	0.17	0	1

Notes: This table displays observations, means, standard deviations as well as the minimum and maximum values for variables of interest.

Appendix Table 2: Estimates of the Effect of Statues by Subject (One/Six-Month)

	Math	Computer	English	Hindi
	(1)	(2)	(3)	(4)
Panel A: One Month				
Statues	0.180*	0.223**	0.149*	0.069
	(0.092)	(0.097)	(0.080)	(0.087)
Placebo	0.083	0.116	0.154*	0.069
	(0.103)	(0.107)	(0.085)	(0.093)
P-value: Statues=Placebo	0.30	0.27	0.94	0.99
Controls	YES	YES	YES	YES
Observations	1053	796	1051	1053
Panel B: Six Month				
Statues	-0.012	0.045	0.079	-0.007
	(0.088)	(0.093)	(0.073)	(0.084)
Placebo	0.031	-0.026	0.040	-0.003
	(0.095)	(0.099)	(0.081)	(0.093)
P-value: Statues=Placebo	0.64	0.45	0.63	0.96
Controls	YES	YES	YES	YES
Observations	1020	771	1019	1021

Notes: This table reports estimates of the effect of treatment on exam score by subject. Panel A reports the effect one month after the intervention, while panel B reports the effect six months after the intervention. All outcomes are standardised. Controls include gender, age, class, device used to watch the videos, and the time used to complete the endline survey. Heteroskedasticity robust standard errors are reported below point estimates. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***.

Appendix Table 3: Estimates of the Effect of Statues (Short Term)

	Hope	Aspiration	Happy	Life Satisfaction
	(1)	(2)	(3)	(4)
Statues	0.099 (0.064)	-0.082 (0.081)	-0.031 (0.075)	-0.100 (0.075)
Placebo	0.057 (0.062)	0.057 (0.074)	-0.020 (0.065)	-0.095 (0.072)
P-value: Statues=Placebo	0.47	0.05	0.87	0.94
Controls	YES	YES	YES	YES
Observations	1048	1041	1039	1036

Notes: This table reports estimates of the effect of treatment on students' psychological outcomes immediately after the intervention. All outcomes are standardised. Controls include gender, age, class, device used to watch the videos, and the time used to complete the endline survey. Heteroskedasticity robust standard errors are reported below point estimates. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Appendix Table 4: Gender Heterogeneity in Treatment Effect on Exam Score by Subject

	One-Month			
	Math	Computer	English	Hindi
	(1)	(2)	(3)	(4)
(A) Statues	0.306*** (0.118)	0.330** (0.135)	0.177* (0.106)	0.138 (0.118)
(B) Statues * Female	-0.301 (0.184)	-0.165 (0.191)	-0.065 (0.159)	-0.165 (0.171)
(C) Placebo	0.033 (0.134)	0.217 (0.139)	0.194* (0.109)	0.045 (0.119)
(D) Placebo * Female	0.118 (0.207)	-0.143 (0.221)	-0.094 (0.170)	0.055 (0.184)
Female	0.006 (0.143)	0.132 (0.148)	0.108 (0.126)	0.133 (0.134)
Controls	YES	YES	YES	YES
Observations	1053	873	1051	1053
Overall Treatment Effect				
Female in Statues (A) + (B)	0.005 (0.143)	0.164 (0.139)	0.112 (0.121)	-0.027 (0.126)
Female in Placebo (C) + (D)	0.151 (0.160)	0.074 (0.173)	0.100 (0.132)	0.101 (0.143)

Notes: This table reports estimates of the effect of treatment on students' exam scores by gender one month after the intervention. All outcomes are standardised. Controls include age, class, device used to watch the videos, and the time used to complete the endline survey. The bottom panel shows the overall treatment effect for each sub-group. Heteroskedasticity robust standard errors are reported below point estimates. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Appendix Table 5: Heterogeneity in Treatment Effect on Math/Computer by Baseline Hope

	One Month		Six Month	
	Score	Pass	Score	Pass
	(1)	(2)	(3)	(4)
(A) Statues	0.022 (0.015)	0.002 (0.010)	-0.005 (0.016)	0.001 (0.002)
(B) Statues * Above Hope	0.009 (0.020)	0.020 (0.016)	0.027 (0.021)	0.024** (0.011)
(C) Placebo	-0.005 (0.018)	-0.034* (0.019)	-0.002 (0.017)	-0.011 (0.009)
(D) Placebo * Above Hope	0.034 (0.023)	0.057** (0.023)	0.023 (0.022)	0.030* (0.016)
Above Hope	0.002 (0.015)	-0.018 (0.014)	-0.016 (0.015)	-0.023** (0.011)
Controls	YES	YES	YES	YES
Observations	1026	1026	1001	1001
Overall Treatment Effect				
Above Hope in Statues (A) + (B)	0.031** (0.013)	0.023* (0.012)	0.022 (0.014)	0.025** (0.012)
Above Hope in Placebo (C) + (D)	0.029** (0.014)	0.023* (0.012)	0.021 (0.014)	0.019 (0.014)

Notes: This table reports estimates of the effect of treatment on students' math and computer performance by baseline hope. Above hope is a dummy variable for if the student's hope score is above the median score. All outcomes are standardised. Controls include gender, age, class, device used to watch the videos, and the time used to complete the endline survey. The bottom panel shows the overall treatment effect for each sub-group. Heteroskedasticity robust standard errors are reported below point estimates. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Appendix Table 6A: Attrition Table

	(1)	(2)	(3)	
	Statues Group	Images Group	Control Group	
	Obs	Mean	Obs	<i>p</i> -value
Baseline	538	513	520	
Attrition Rate	0.27	0.26	0.28	0.70

Notes: This table examines the attrition rate by groups. Column 4 shows an F-test of equality of the means across the three groups for attrition.

Appendix Table 6B: Attrition Regression

	(1)
	Attrition
Statues	-0.013 (0.028)
Placebo	-0.023 (0.028)
Observations	1,571

Notes: Linear regression of treatment indicators on a variable equal to one if the student was not surveyed at endline. Robust standard errors in parentheses.

Appendix Table 7: Sensitivity Test for Excluding Outliers of Survey Duration (One/Six-Month)

	Math/Computer Exam Passing		
	Duration < 1.5 Hours	Duration < 2 Hours	Duration < 4 Hours
	(1)	(2)	(3)
Panel A: One Month			
Statuses	0.266** (0.120)	0.249** (0.119)	0.233** (0.118)
Placebo	0.031 (0.166)	0.030 (0.165)	0.013 (0.163)
P-value: Statuses=Placebo	0.08	0.09	0.09
Controls	YES	YES	YES
Observations	1,011	1,022	1,026
Panel B: Six Month			
Statuses	0.270** (0.130)	0.262** (0.127)	0.249** (0.120)
Placebo	0.133 (0.160)	0.133 (0.159)	0.120 (0.152)
P-value: Statuses=Placebo	0.11	0.12	0.12
Controls	YES	YES	YES
Observations	986	997	1,001

Notes: This table reports estimates of the effect of treatment on exam passing by the time used to complete the endline survey. All outcomes are standardised. Controls include gender, age, class, device used to watch the videos, and the time used to complete the endline survey. Heteroskedasticity robust standard errors are reported below point estimates. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

8.2 Intervention script

M.K. Gandhi

Mahatma Gandhi is known as the father of our nation. He led India to freedom against the British. His legacy, however, has a humble beginning.

One night, he was boarding a train in South Africa. He had a ticket for a first class compartment. When he went to his seat, he was told that the compartment was for whites only. He was thrown out.

He spent the whole night in the cold, thinking about how much discrimination he would face in the future. He thought: he can either accept reality - as it is - give up his career, and go back. Or he can stay, and fight for his rights and those of his people!

He spent 21 years in South Africa fighting against discrimination, and then went back to free India from the British. He led the Satyagraha Movement. In spite of all the challenges that came his way, his faith was unfettered. As he persevered, people joined him in his quest.

He had to face many problems along the way. He spent over two thousand days in jail, and suffered from several health problems during his journey.

The dream of India's freedom was the only thing in his mind. It was because of this determination and will power that we are living a free and happy life in our Independent India!

"The future depends on what you do today."

Arjuna

Arjuna - the son of Kunti and Pandu - was one of the most important characters of the Mahabharata. From a very young age, his passion and commitment to learning was clear.

Never missing an opportunity to learn, one evening, while eating in the dark, he realised that his hands reached his mouth effortlessly. He figured, if practice could help him eat in the dark, it could also help him aim in the dark. He started practicing archery immediately, and perfected his aim.

Later one day, Guru Dronacharya - the teacher of the Pandavas - asked them to aim and shoot at the eye of a wooden fish that he had tied to a tree. They had to shoot by looking at its reflection in the lake below. He then asked each student what they saw. Their answers ranged from the tree, water, leaves, to the sky. But Arjuna said: "The eye."

Arjuna could disregard everything else, and focus his mind and attention only on his target. Naturally, the shot was executed successfully.

Through focus and dedication, Arjuna emerged as one of the strongest and most skilled characters in the Mahabharata.

"When you want to achieve something, you must focus on it. Close out all other distractions, and concentrate only on your target." -Guru Dronacharya

Indira Gandhi

Indira Gandhi, the Iron Lady of India, was the first, and to this day, the only female Prime Minister of India. She brought prosperity to the general public and strength to the nation.

Her father, Dr. Jawaharlal Nehru, was often away, and her mother, frequently sick. She spent a lonely childhood. But her father used to write her letters full of wisdom and inspiration. In one letter he wrote-

"For the desire to hide anything means that you are afraid, and fear is a bad thing and unworthy of you. Be brave, and all the rest follows. We work in the sun and in the light."

These letters had a significant impact on her personality, bold and courageous.

Growing up, she didn't let gender stereotypes stop her. She grew up climbing trees, flying kites, and playing marbles with her cousins, most of whom were male.

Indira Gandhi stunned the whole world with her fearlessness, confidence, and strength by breaking the glass ceiling!

"Let's not forget, in India the symbol of strength is a woman. The Goddess Shakti."

Bhim Rao Ambedkar

Dr. Bhimrao Ramji Ambedkar, was one of the most learned Indian politicians of his time. He yearned to learn, but surprisingly he wanted to stop studying at the age of 10. Nevertheless, as we all know, the story turned out differently.

He was born in a backward caste and faced discrimination. Even in school, he was humiliated, and treated as an 'untouchable' because of his caste. He was not even allowed to touch the tap for drinking water. When he was really thirsty, the peon would pour water into his upturned mouth, taking care not to touch his body. When the peon was unavailable, he had to stay thirsty all day long.

Once, he thought of running away from school, and taking a job in a factory in Bombay, but decided against it. Trying to run away was useless. He decided to face his problems. He studied hard to gain knowledge and respect. This self-motivation proved to be a life-changing event not only for himself, but also for the nation.

After he graduated from Bombay University, He received a scholarship to go to Columbia University and The London School of Economics. When he came back, he took it upon himself to end discrimination in India. He became an economist and a social reformer, who inspired the Dalit Buddhist movement. Later, he was appointed by the Assembly to write Independent India's first Constitution.

"They tried to bury me. They did not know that I was a seed."