Perception of Gender in Startups

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Abstract

I look at the perception of founders of startups. I study the effect of age, education, gender, and background. I find important differences between gender and background of the founders as well as the time taken to respond for some cases in case of female and male respondents. Perception differences across gender(negative), age(positive), region(positive), and startup experience(postiive) are analysed based on the traits of the founders. This has implication for investors, employees and customers. We make policy recommendations with regard to sensitization and encouraging gender diversity.

1 Introduction

1.1 What we do

Startups are not the same as traditional businesses. They differ in method, founder demographics, scale-up and most importantly the use of technology. Recent success stories have lent social acceptance to 'startup culture'. Repeated appeals by the Hon'ble Prime Minister have ensured a paradigm shift in how startups are perceived. [1]. We look at how the gender and background of founders impacts the perceived probability of success of a startup. We use different cases to look at the difference between male and female founders, at varying education levels (12th, IIT-IIM) and background (Successful startup, Failed Startup) and age (20,30,40 years).

1.2 What we find

We find no statistically significant difference between the success probability for males and females across education levels. In fact success is more likely for female cofounders. The mean value of success for a startup founded by school

[1] More about Startup India Programme

educated females at 0.64 is lower than that of IIT-IIM educated females at 0.72. This is at a p-value of 0.07 making it statistically significant.

1.3 Some thoughts

We are trying to see why women based startups are so few. [2]. This could be due to lack of capital, lack of mentorship or lack of business acumen. Through this study we wish to identify the bias towards or against women-led startups by studying perception of such startups by general population.

1.4 See if this is usable

Vision 2025 for Startup India includes not only 50000 startups, but also a higher representation of women. At present less than 15% of all startups are women founded[3] , and less than half the recognised startups (20k) have at least one woman director[4] . We recently completed an RFP for on-boarding partners in each zone in the country (there are five zones) for training women entrepreneurs. We also want to ensure that at least half of our beneficiaries are women led startups. This calls for a major capacity building exercise and in order to understand various areas of intervention, we would like to conduct online surveys with people regarding their perception of women led startups vis a vis others.

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Perception plays a very important role in the startup journey. If people, in general, fe
Through these surveys we would want to gauge perception of women led startups under diff
```

1.5 Why it is important

Startups are not the same as traditional businesses. Perception is important. Customers, investors, employees.

2 Literature

2.1 Importance of perception

Perception of a business is important. Suppliers rely on this. Bankers rely on this. Hunch based. Angel Investors rely on them. Good employees rely on this.

[2] CURRENT DATA: Where all, how many, sectors etc.
[3] NEED SOURCE
[4] NEED SOURCE

2.2 Perception of Founders

Perception of them is the perception of business.

2.3 Perception in case of startups

In case there is some literature available for this.

3 Method

We use a (What is that thing, it is not difference in difference. It is to see the difference in how people react to one group versus another). Each set of participants is given only one case. Each case involves basic details about the startup. These details are consistent across all groups. Each group is given details about the founders. This varies across groups. Each group is given only one set of details about the founders. Based on the data, they are asked to demarcate the probability of success, probability of failure and probability of abandonment of the startup. Each of these is taken in discrete probabilities from 0 to 100 in intervals of 10.

```
\subsection{Variables}
```

We modify the following details about the founders * Education * Low Education * Technical Education * Management Education

- Government Connect * Family in government service * Ex-government service
- Age
  - Young
  - Mid-age
  - Old
- Region * Metro city * Tier II City
- Startup Experience
  - Founder
  - Successful startup
  - Failed startup

```
*    Employee
    *    Successful startup
    *    Failed startup
```

```
    For each variable we see whether there is a difference in how male and female co-founde


\subsubsection{Education}
        Education should mitigate the differences of gender, at least in terms of ability. I


\subsubsection{Age}
        While experience is considered as a major requirement in terms of employment, it may

        We expect young startups to be perceived negatively. At 22,23, it is unlikely that t


\subsection{Region}
        Bengaluru, Karnataka was house to over 45\% of the startup deals in the country in 2
        Being from a city that saw the maximum percentage of deals for startups, it is possi



\subsection{Government Connect}
        Is it just because one understands how the government works, and where to look for f



\subsection{Startup Experience}

    Startups are different from traditional businesses. Most of the times they have to chart
```

4 Data Summary

We use anonymously filled surveys from over 1000 participants. The break up of these participants is given in Table **??**.

4.1 Data Summary

We look at the summary of responses for each case. We have three metrics that we measure across all cases. Our metrics are Probability of Success, Probability of Funding and Probability of Abandonment.

4.2 Probability of Success

We first look at the summary of responses when we change education of the founders. We see these effects for male as well as female founders.

Table 1: This tables shows the summary of responses in the case where the startup founders were females and studied from IIT and IIM.

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Age	51	31.118	7.210	19	25	36.5	49
Success	51	0.716	0.195	0.300	0.600	0.850	1.000
Funding	50	0.640	0.209	0.000	0.500	0.800	1.000
Abandon	51	0.341	0.279	0.000	0.100	0.500	1.000

Table 2: This tables shows the summary of responses in the case where the startup founders were male and studied from IIT and IIM.

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Age	50	32.180	9.249	18	25.2	37	59
Success	50	0.652	0.257	0.000	0.500	0.875	1.000
Funding	50	0.608	0.228	0.000	0.500	0.800	1.000
Abandon	50	0.358	0.289	0.000	0.100	0.575	1.000

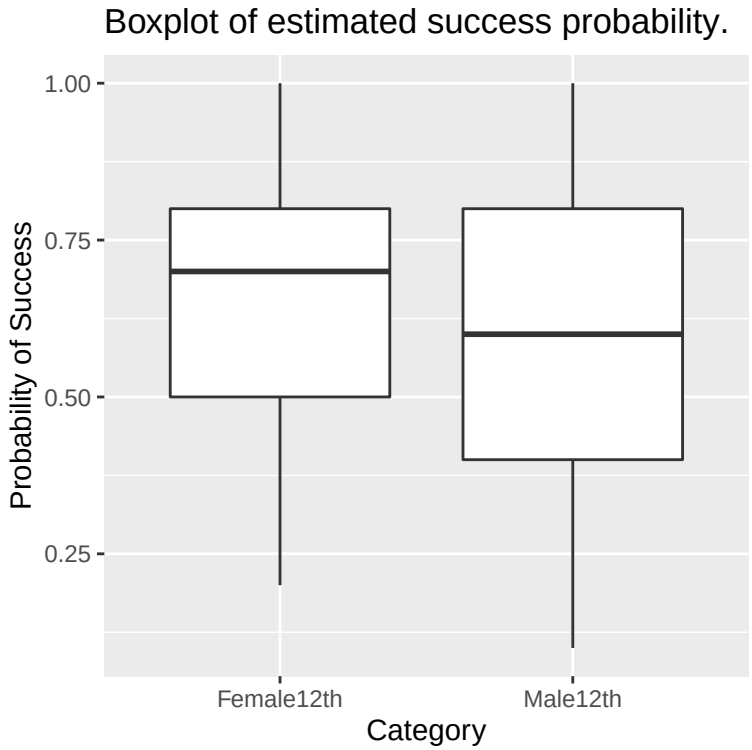
Table 3: This tables shows the summary of responses in the case where the startup founders were males who had only completed school.

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Age	51	30.980	9.153	19	23.5	35.5	51
Success	51	0.612	0.256	0.100	0.400	0.800	1.000
Funding	48	0.608	0.222	0.100	0.500	0.700	1.000
Abandon	50	0.416	0.279	0.000	0.200	0.500	1.000

In figure **??** We look at how people perceive the probability of success for a startup founded by males versus that founded by females, when they have only completed schooling. While the mean value of success for a startup founded by school educated females at 0.64 is higher than that of males at the same educated level at 0.61 , the difference is not statistically significant at a p-value of 0.5.

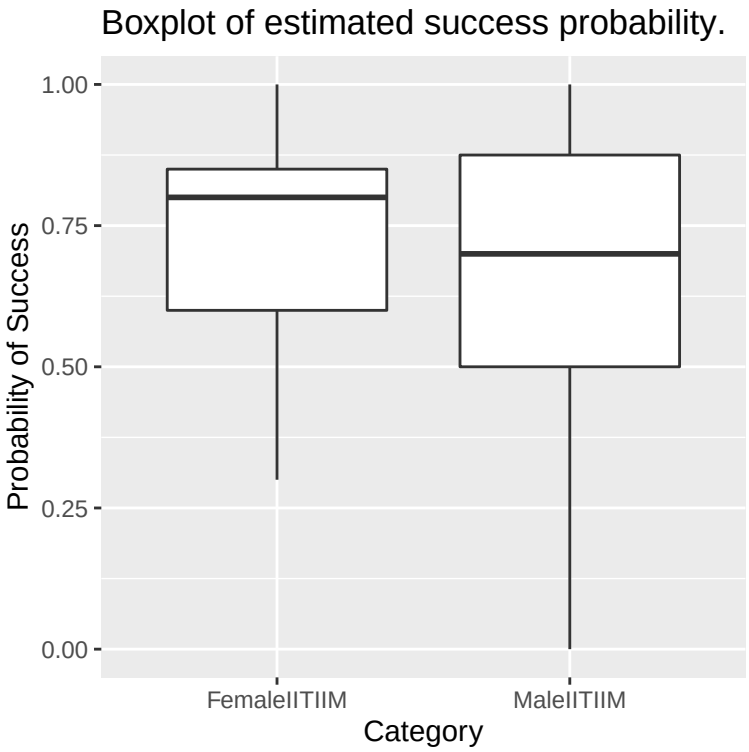
Table 4: This tables shows the summary of responses in the case where the startup founders were females who had only completed school.

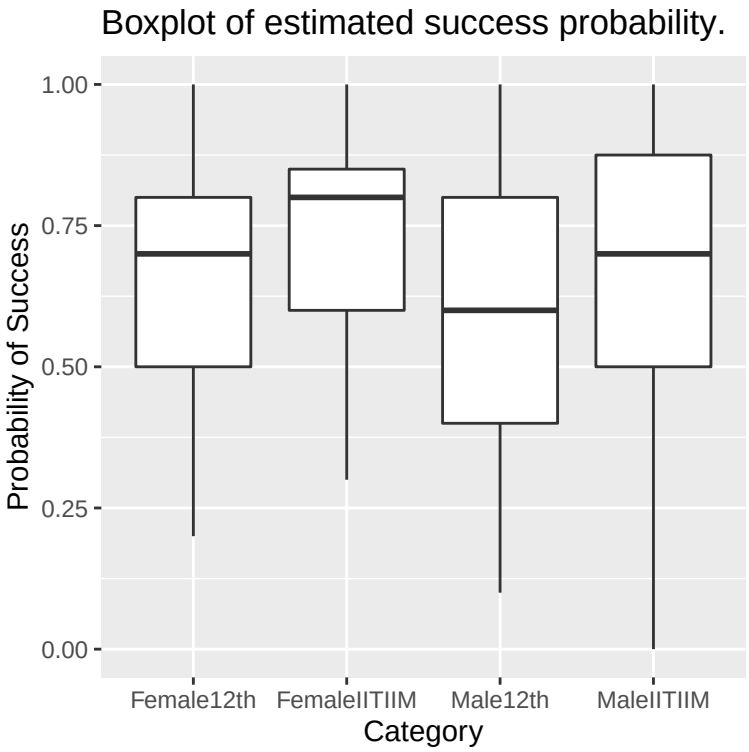
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Age	51	30.510	7.908	20	24	36	55
Success	51	0.643	0.210	0.200	0.500	0.800	1.000
Funding	51	0.620	0.232	0.200	0.450	0.800	1.000
Abandon	51	0.412	0.288	0.000	0.200	0.550	1.000



In figure **??** We look at how people perceive the probability of success for a startup founded by males versus that founded by females, when they have studied at premier institutes at undergrad as well as post graduate level. While the mean value of success for a startup founded by IIT-IIM educated females at 0.72 is higher than that of males at the same educated level at 0.65, the difference is not statistically significant at a p-value of 0.16.

It is worth noting that in both cases, the mean value of probability of success is surprisingly higher for female led statups in both cases.


Boxplot of estimated success probability.
Probability of Success
1.00
0.75
0.50
0.25
0.00
FemaleIITIIM
MaleIITIIM
Category



The mean value of success for a startup founded by school educated females at 0.64 is lower than that of IIT-IIM educated females at 0.72. This is at a p-value of 0.07 making it statistically significant. The mean value of success for a startup founded by school educated males at 0.64 is lower than that of IIT-IIM educated females at 0.65. This is at a p-value of 0.43 making it statistically insignificant.

This means the value of education is higher for females as compared to that in the case of males. Educated females are perceived to be more likely to find success in their startup whereas the same effect is not found for males.

%%%%%%%%%%%%%%%%%%%%Funded%%%%%%%%%%%%

4.3 Probability of Getting Funded

In figure **??** We look at how people perceive the probability of success for a startup founded by males versus that founded by females, when they have only completed schooling. While the mean value of success for a startup founded by school educated females at 0.62 is higher than that of males at the same educated level at 0.61, the difference is not statistically significant at a p-value of 0.81.

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## Warning: Removed 3 rows containing non-finite values (stat_boxplot).
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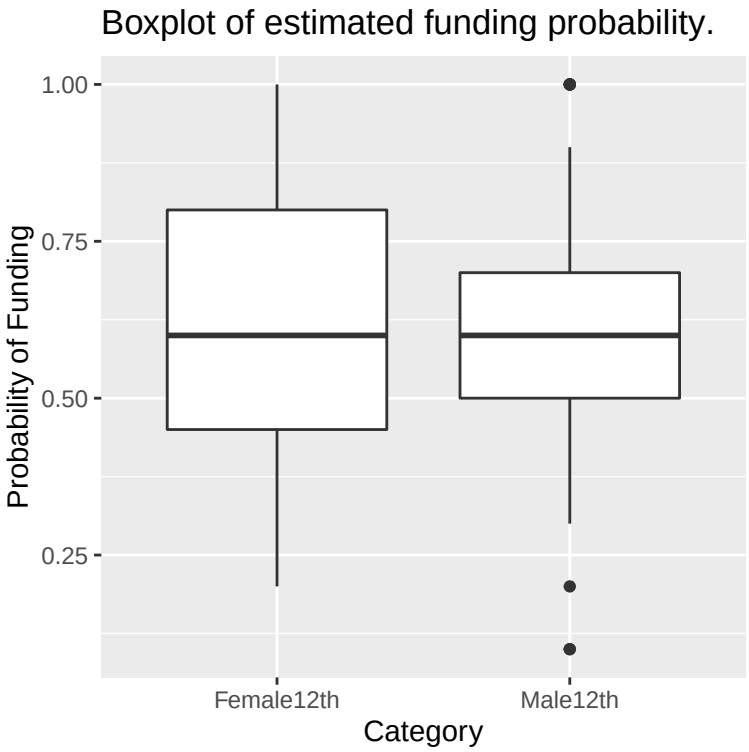

In figure **??** We look at how people perceive the probability of funding for a startup founded by males versus that founded by females, when they have studied at premier institutes at undergrad as well as post graduate level. While the mean value of funding for a startup founded by IIT-IIM educated females at 0.64 is higher than that of males at the same educated level at 0.61, the difference is not statistically significant at a p-value of 0.47.

It is surprising to see that the probability of funding is higher for female founded startups irrespective of level of education of the founders.

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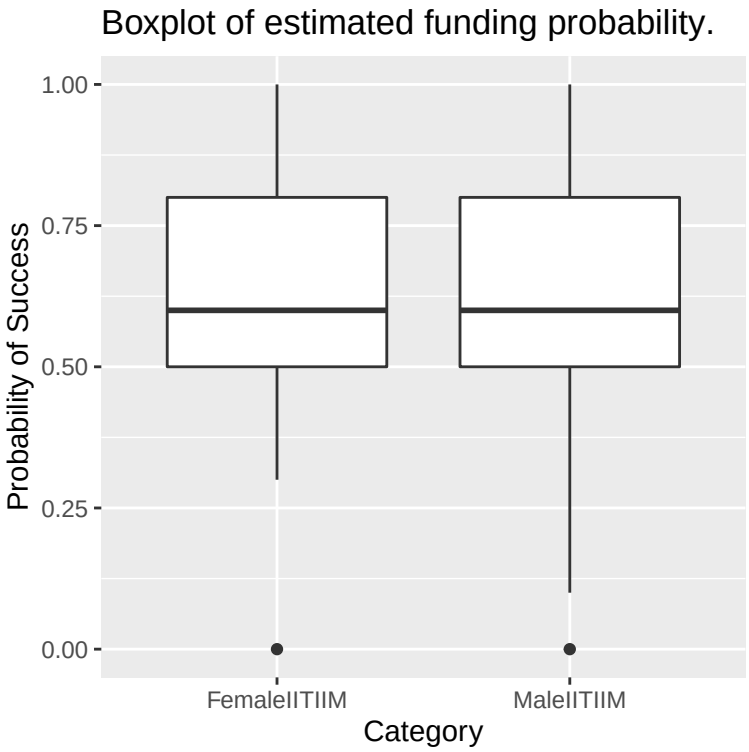


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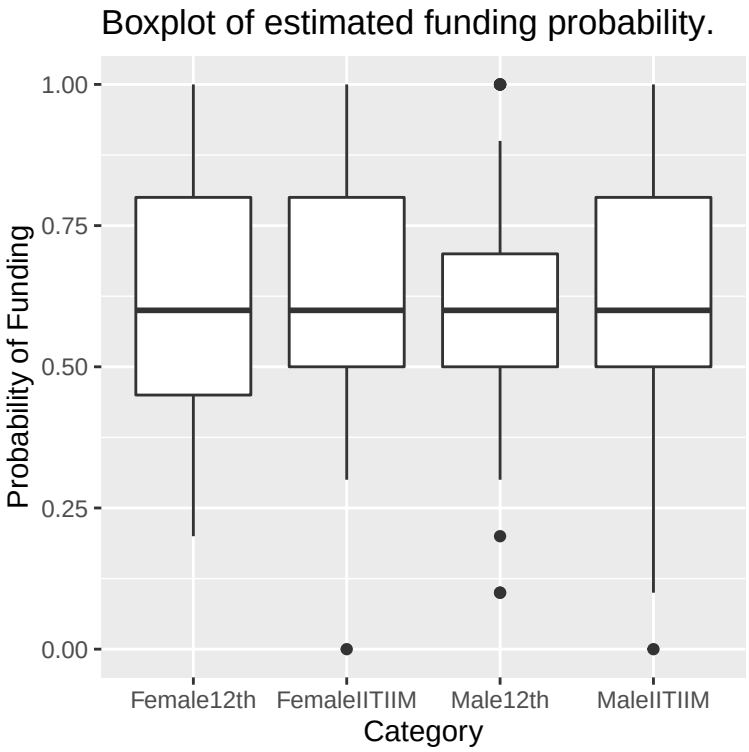

The mean value of success for a startup founded by school educated females at 0.62 is marginally lower than that of IIT-IIM educated females at 0.64. This is at a p-value of 0.64 making it statistically insignificant.

The mean probability of funding for a startup founded by school educated males at 0.61 is the same as that of IIT-IIM educated females at 0.61. This is at a p-value of 0.99 making it statistically insignificant(and also irrelevant).

Education seems to have no role in the perceived probability of funding of a startup. This is contrary to conventional wisdom that says people from premier institutes get disproportionately high funding.

%%%%%%%%%%%%%%%%%%%%%%Abandon%%%%%%%%%%%%%

4.4 Probability of Abandoning Project

One of the common aspects of social bias against females is that they would start a family and abandon their project/job/startup. This is true for traditional businesses and is cited as one of the reasons for unequal representation of women in the workplace.

In figure **??** We look at how people perceive the probability that the founders will

abandon a startup founded by males versus that founded by females, when they have only completed schooling. While the mean probability that the founders will abandon a startup for school educated females at 0.41 is higher than that of males at the same educated level at 0.42, the difference is not statistically significant at a p-value of 0.94.

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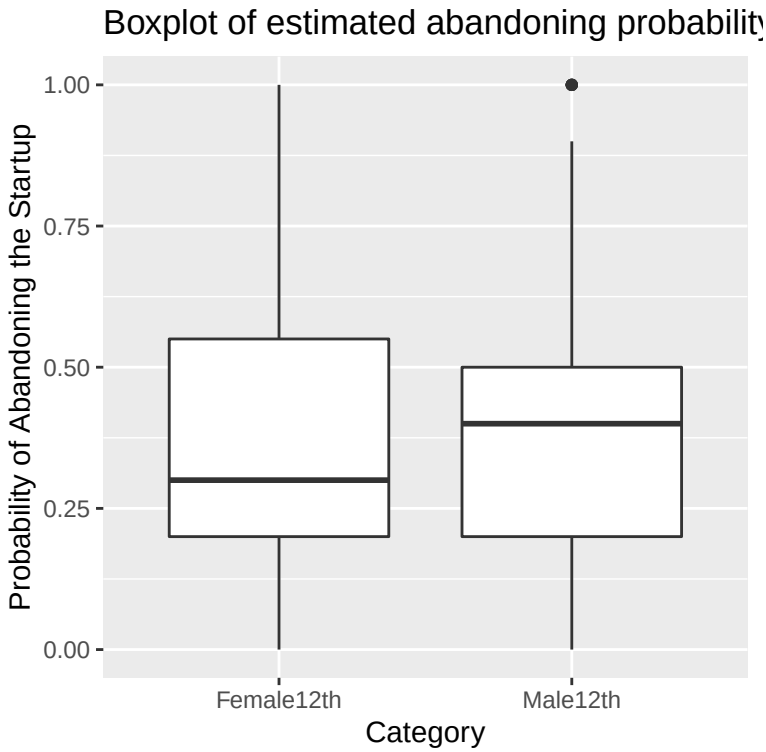
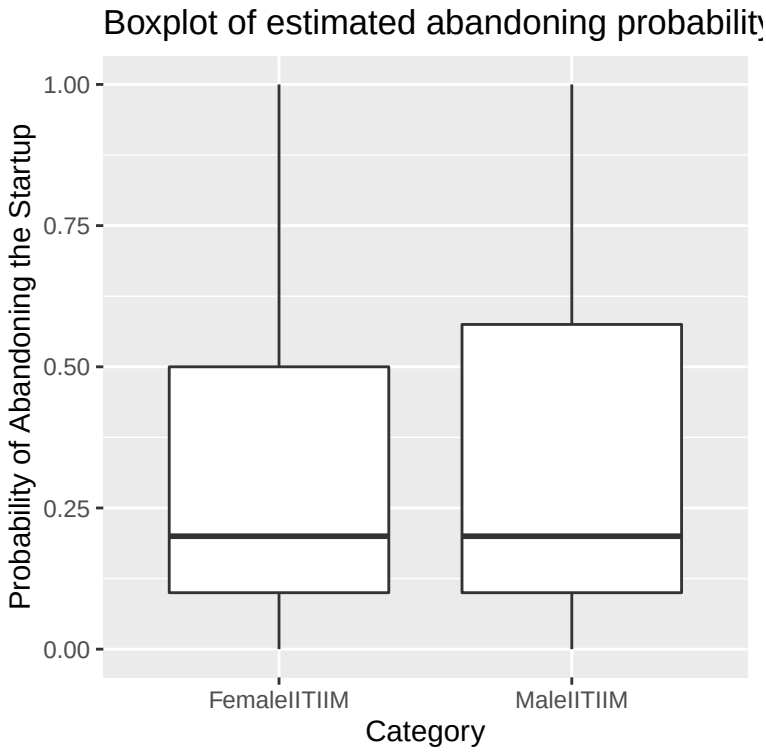


In figure **??** We look at how people perceive the probability that the founders will abandon their startup for males versus females, when they have studied at premier institutes at undergrad as well as post graduate level. While the mean probability of abandoning a startup founded by IIT-IIM educated females at 0.34 is higher than that of males at the same educated level at 0.36, the difference is not statistically significant at a p-value of 0.77.

It is surprising to note that the probability that the startup will be abandoned is lower for female led startups in both cases as compared to male founded startups.

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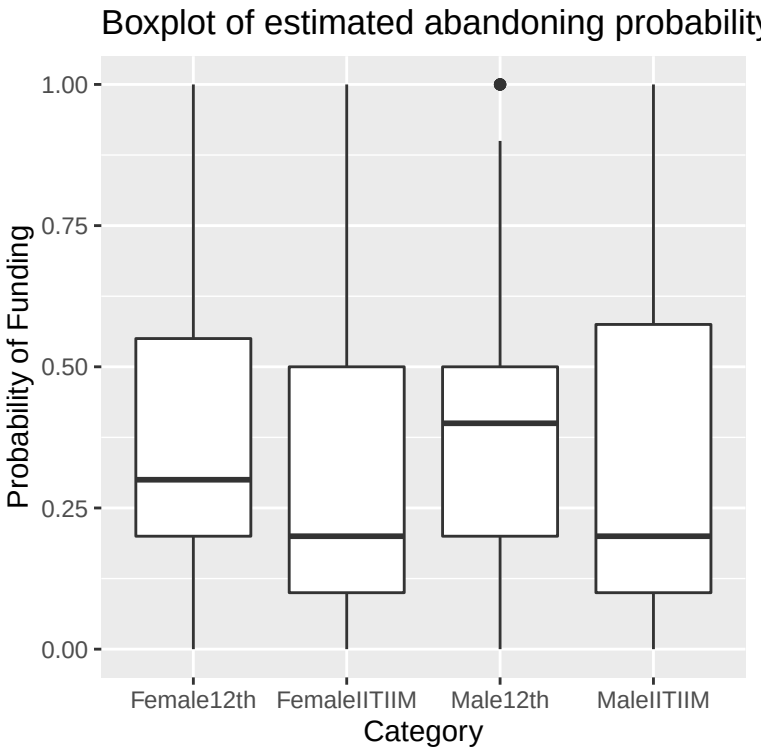

The mean probability that a startup founded byschool educated females will be abandoned at 0.41 is higher than that of IIT-IIM educated females at 0.34. This is at a p-value of 0.21 making it statistically insignificant.

The mean probability that a startup founded byschool educated males will be abandoned at 0.42 is the slightly higher than that of IIT-IIM educated males at 0.36. This is at a p-value of 0.31 making it statistically insignificant.

5 Later

5.1 Comparison between Success, Abandon, Funding

We run multiple t-test between all combinations for the probability of success, probability of abandonment and probability of funding. We note down the p-value for each t-test. This gives us the number of differences that are statistically significant.

Table 5: Table showing total number of significant pvalues for each Case and Metric

	Variable	Number of Significant pvalues
1	Name	0
2	MaleIITIIM	1
3	FemaleIITIIM	10
4	FemaleYoung	2
5	Female12th	1
6	Male12th	4
7	FemaleOld	2
8	FemaleMidAge	4
9	MaleYoung	7
10	FemaleFailedFounder	6
11	MaleOld	0
12	MaleMidAge	2
13	MaleFailedFounder	1
14	SuccessfulFounder	1
15	FailedFounder	5
16	SuccessfulEmployee	5

6 Time Taken

```
## # A tibble: 2 x 2
##   Gender timediff
##   <chr>  <drtn>
## 1 Female 79.85570 secs
## 2 Male   54.79843 secs
```

```
## `summarise()` has grouped output by 'Gender'. You can override using the `.groups` argume
```

Similarly, we look at the time it took people to tackle various cases. There is extant research to show that when people are not familiar with words or concepts they take more time to process it. We look at the difference between the time taken by each group to answer their case. Since the cases are randomly distributed and there is no incentive for anyone to do it faster or slower, the responses are independent. We look at the t-tests between the timings and summarise the same in a table. We further reduce the same to see the differences between genders for the same group. For example do women take more time to fill out the survey concerning a highly educated female, as compared to men? We summarise the total number of significant differences in the time taken in the following table.

```
\section{Limitations}
    We do not analyse the results based on the background of the respondents. We take only c
```

Table 6: This table shows the pvalue of the t-test between the time taken to fill the survey case by males and females.

	Case	p value of t test
1	MaleIITIIM	0.0294582453721369
2	FemaleIITIIM	0.343917462931821
3	FemaleYoung	0.408732009702788
4	Female12th	0.302587372186994
5	Male12th	0.387664999219639
6	FemaleOld	0.186405692459717
7	FemaleMidAge	0.71844507770071
8	MaleYoung	0.15047012478631
9	FemaleFailedFounder	0.0153527172228556
10	MaleOld	0.826970453715579
11	MaleMidAge	0.138545652500287
12	MaleFailedFounder	0.76852904289724
13	SuccessfulFounder	0.833332754768954
14	FailedFounder	0.258000570935006
15	SuccessfulEmployee	0.188998642044013
16	GovtFather	0.554794454887403

We do not look at Foreign education.
We do not specify the role in government service. It is possible that a bureaucrat is re