



DETERMINATION OF GENDER PREJUDICES OF TEACHERS: THE PANEL DATA ANALYSIS

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What is gender prejudice?

A prejudice is an opinion - usually an unfavourable one - that was formed before having any evidence and that is not based on reason or experience.

Prejudices are often rooted in the idea that certain types of people are worth less or are less capable than others.

What is gender prejudice?

Stereotypes and prejudices are harmful, because they ignore the fact that each person has his own abilities, strengths, weaknesses, desires, thoughts and feelings.

Our sex and gender are a part of who we are, but these characteristics do not define us.

Even if the stereotype is correct in a particular situation, someone suppresses or acts in a discriminatory way, does not encourage this person to succeed.

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What is gender prejudice?

In the educational sphere, all kinds of prejudices are especially harmful, since they form in some students a misconception about themselves as "The Ugly Duckling" and do not allow them to develop into a full-fledged personality, and eventually become a good teacher, a successful person.

And as for other students, their prejudices are fixed, and then replicated to their students.



The objectives of research

The necessity to identify the prejudices of teachers determines the main objectives of our study



Panel Data Analysis

Panel data analysis is a statistical method, widely used in social science, and econometrics to analyze two dimensional (typically cross sectional and longitudinal) panel data. The data are usually collected over time and over the same individuals and then a regression is run over these two dimensions.

But dimension can not be only time, but conditions of survey, separated individuals, etc.

In our case it were teachers and gender of students.

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Panel Data Analysis

A common panel data regression model looks like

$$y_{it} = a + bx_{it} + e_{it}$$

where

y is the dependent variable,

x is the independent variable,

a and ***b*** are coefficients,

i and ***t*** are indices for dimensions.



What does panel data look like?

- Each of N individual's data is measured on T occasions
- Individuals (first dimension) may be people, firms, countries etc.
- Some variables change for the second dimension $t = 1, \dots, T$
- Some variables may be fixed for different value of t (*usually t is a time period*), such as gender, the geographic location of a firm or a person's ethnic group
- When there are no missing data, so that there are NT observations, then we have a balanced panel (less than NT is called an unbalanced panel)
- Typically N is large relative to T , but not always



Table of panel data

i	Y	t=1	t=2	t=3	t=4	x1	x2
1	73,33	0	1	0	0	54	80
2	80,67	1	0	0	0	64,475	83
3	60,89	1	0	0	0	70,725	60
...
1	89,11	0	0	0	1	70,575	95
2	76,00	0	0	1	0	64,475	98
3	60,33	0	0	1	0	70,725	60



Problems

In our case, there were several problems:

1. What data should be used as dependent and independent variables?
2. If i is a number of a separate individual, what data should be used as t ? In our case it were teachers and gender of students?
3. It turned out that it is not so easy to collect data for panel analysis: it was necessary to find cases when different teachers taught the same discipline to the same students. Usually a group of students is led by one teacher.

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Table of panel data

i		Y	t=1	t=2	t=3	t=4	x1	x2
№	Names	Average (Y)	teacher1 (boys) P1	teacher1 (girls) P2	teacher2 (boys) H1	teacher2 (girls) H2	Entrance exams	Calculus
1	Student_1	73,33	0	1	0	0	54	80
2	Student_2	80,67	1	0	0	0	64,475	83
3	Student_3	60,89	1	0	0	0	70,725	60
...
23	Student_2	76,00	0	0	1	0	64,475	98
24	Student_3	60,33	0	0	1	0	70,725	60
25	Student_4	89,11	0	0	0	1	70,575	95



Results for Group1

<i>Regression statistics</i>	
Multiple R	0,998
R-square	0,996
Normalized R-square	0,968
Standard error	4,710
Observations	42,000

– the constructed model explains 99.6% of the dispersion

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sign. F</i>
Regression	6,000	220768,990	36794,832	1658,434	0,000
residue	36,000	798,714	22,186		
Total	42,000	221567,704			

– significant model

	<i>Coefficients</i>	<i>Standard error</i>	<i>t-statistics</i>	<i>P-Value</i>
Y	0,000	#Н/Д	#Н/Д	#Н/Д
P1	14,784	4,842	3,053	0,004
P2	14,658	4,989	2,938	0,006
H1	13,465	4,897	2,749	0,009
H2	18,817	4,780	3,937	0,000
Entrans exams	0,319	0,078	4,114	0,000
Calculus	0,487	0,065	7,522	0,000

Results for Group1

$$y=14,784 \cdot p_1+14,658 \cdot p_2+13,465 \cdot h_1+18,817 \cdot h_2+0,319 \cdot Exams+0,487 \cdot Calc$$

	Boys	Girls	p-value of t-criterion
Average score for the year	67,75	73,58	0,048
Learning progress (P.)	70,83	79,9	0,042
Learning progress (H.)	72,67	73,6	0,45



Results for Group2

Regression statistics		ANOVA					
Multiple R	0,997						
R-square	0,995		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sign. F</i>
Normalized R-square	0,972	Regression	6,00	280304,45	46717,41	1470,62	0,000
Standard error	5,636	Residue	45,0	1429,523	31,767		
Observations	51,00	Total	51,0	281733,97			

	Boys	Girls
Learning progress (B.)	67,17	76,82
Learning progress (Г.)	64,67	74,76

$$y = 0,62calc + 26,33e_2 + 26,35g_2$$

	<i>Coefficients</i>	<i>Standard error</i>	<i>t-statistics</i>	<i>P-Value</i>
Y-intersection	0,000	#Н/Д	#Н/Д	#Н/Д
Exams	0,171	0,098	1,748	0,087
Calculus	0,492	0,103	4,784	0,000
B1	-0,253	2,828	-0,089	0,929
B2	25,700	7,538	3,409	0,001
G1	-3,214	3,807	-0,844	0,403
G2	25,972	7,483	3,471	0,001

Results for Group3

	<i>Coefficients</i>	<i>Standard error</i>	<i>t-statistics</i>	<i>P-Value</i>
Y-intersection	0,000	#Н/Д	#Н/Д	#Н/Д
X1	3,302	2,255	1,464	0,150
X2	16,309	5,884	2,772	0,008
F1	-4,011	2,894	-1,386	0,173
F2	16,180	5,895	2,744	0,009
Algebra	0,755	0,090	8,377	0,000
Exams	0,050	0,078	0,636	0,528

$$y = 19,15 \cdot x_2 + 17,74 \cdot f_2 + 0,72 \cdot algebra + 0,06 \cdot exams$$

Is this difference significant?



Results for Group4

	<i>Coefficients</i>	<i>Standard error</i>	<i>t-statistics</i>	<i>P-value</i>
Y-intersection	0	#Н/Д	#Н/Д	#Н/Д
K1	31,189	5,075816	6,144671	8,14E-07
K2	35,469	5,249885	6,756261	1,46E-07
P1	22,152	6,575315	3,368981	0,002032
P2	22,632	6,892862	3,283443	0,002545
Calculus	0,603	0,076814	7,861677	7,13E-09

Is this difference significant?

Conclusions

Stereotypes do not just describe what people are; they also determine what they should be or what role they should have based on characteristics such as sex, gender, marital status, etc. Prejudices, like stereotypes, cause people to make value judgments and to assume that people can or can not do because of who they are. All this leads to discrimination and limits equality of opportunity.

As a result of our study, we found that comparing the assessing the educational achievements of boys and girls by different teachers, we can identify the presence of their gender prejudices

This results turned out to be interesting, but due to a small sample, it is too early to say that the proposed toolkit is suitable for solving such problems. So, further study is required

