Testing Gender Bias in Chinese Culture

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ABSTRACT
Research on teacher's gender bias toward students is an important part of the process. This study aims to test whether teachers contain gender bias based on their sex. Furthermore, this study will test the influence of gender bias from teachers on students' academic behavior to find whether gender bias is reflecting negative influence in education system. From the results, we're going to be able to identify the underlying sexism in the education system and be able to target it.

Keywords: gender bias, education system, implicit test

1. INTRODUCTION

In the process of human social development, people have focus on bias for centuries long. It seems that even though people have progressed a lot, humans still have to examine for themselves the question of how to treat other groups. Till now, empirical studies have found widely shared cultural beliefs that men are more socially valued and more competent than women in a number of activities [1].

Now, Gender stereotypes are widely held beliefs about the characteristics and behavior of women and men. This happens all the time in the education system. For example, In Ontario, Education Minister Janet Ecker said that the results of the standardized grade 3 and grade 6 testing in math and reading showed, "...persistent and glaring discrepancies in achievements and attitudes between boys and girls." [2]. In British Columbia, standardized testing indicates that girls outperform boys at all levels of reading and writing and in Alberta testing shows that girls, "...significantly outperform boys on reading and writing tests, while almost matching them in math and science."[2]

However, there is few researches about gender bias in China in modern time, so researches on this field are required for dealing with gender bias in Chinese education system.

2. LITERATURE REVIEW

Gender bias, as the hot topic in society, has always stood in the lime light in the public mind. To be detailed, gender stereotypes is one of the examples of gender bias, which are the fixed ideas about men's and women's traits and capabilities and how people should behave, based on their gender, that's what we study in this research. Just like a kind of group bias, people always more or less encounter gender bias. For example, some parents prefer that their daughters should do nursing work seems to be more suitable for women, because they think woman cannot do other kinds of work like police officer or scientific projects [3]. In book "Still Failing at Fairness", researchers David S, Myra S, and Karen Z describe several years of observations in public and private school classrooms across the country. They found that starting in elementary school, teachers had less contact with female students and asked them fewer questions, while providing more feedback to male students [4].

In education area, differences in degrees, resource allocation, faculty allocation, teaching attitude between male students and female students are all seems to be the symbols of gender bias. In the chart below, the difference number of users of online education platform between male and female can reflect about gender discrimination:
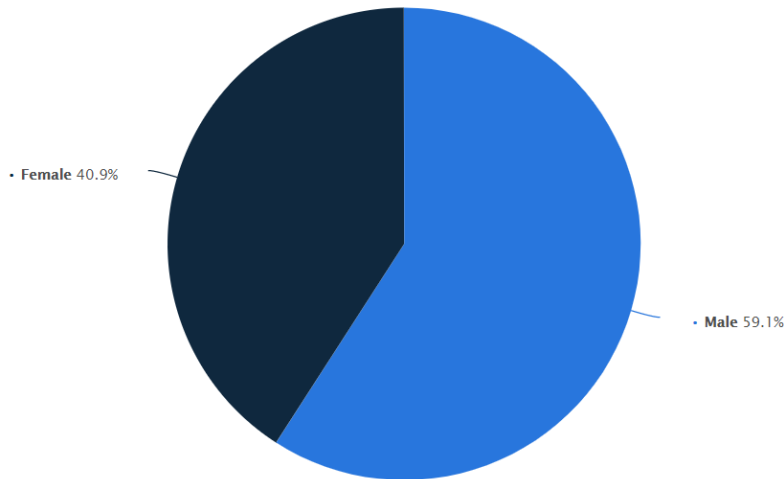
Figure 1: user distribution of online education platform Tencent Classroom in China in 2020 by gender. Published by C. Textor, Mar 24, 2021
(https://www.statista.com/statistics/1223740/china-online-education-platform-tencent-classroom-user-distribution-by-gender/#statisticContainer)

"Gender Bias in Education is an insidious problem that causes very few people to stand up and take notice. Over the years, the uneven distribution of teacher time, energy, attention, and talent with boys getting the lion's share, takes its tolls on girls. The gender bias in education reaches beyond socialization patterns: bias is embedded in textbooks, lessons, language, and teacher interactions with students. This type of gender bias is a part of the hidden curriculum of lessons taught implicitly to students through the everyday functioning of their classroom" [6]. For teachers, treating every student fairly is attributed to the professional ethics of the teacher. However, it is fact that not all teachers treat their students equally, reflecting in many aspects, such as selecting classes or arranging seats. Many researchers have studied the gender bias in education and the factors to measure gender bias [7]. At the same time, teachers are an important starting point for promoting gender equality in schools, as their gender stereotypes and educational practices have been found to have a significant impact on gender differences among students. Elementary school teachers believe that girls with average grades are less talented than boys with equal grades. In addition, teachers were found to attribute more unexpected failures in girls to poor ability rather than lack of effort than unexpected failures in boys. In terms of classroom interactions, boys were found to receive more praise and critical feedback from teachers and spend more time talking in class than girls. Therefore, it is not surprising that gender stereotypes of teachers are associated with students' academic self-concept [8].

These studies show that students will behave better or worse under gender bias. However, in China, there few researches based on gender bias of adolescents. Most of those researchers believe that gender bias in family has play a influential role in students' academic performance;

in fact, students will spend more time studying in school, as a result of which it makes teachers' bias against students having a strong impact on students' academic performance.

In this situation, figuring out the potential impact from gender bias in education and the difference on gender bias between urban and rural areas seem to the important research goal for us, since this goal can help us to understand the gender bias in educational area and seek for corresponding solutions.

3. HYPOTHESES

Due to the shortage of educational resources, one of the hypotheses is that in rural areas, teachers will show stronger gender bias towards students in total [7]. For the hypothesis for urban area, teachers will show less gender bias against students compared with teachers in rural area. For both urban and rural area, the greater gender bias showed by teachers, the worse students will behave academically.

In other aspects, both teachers and students' gender will influence gender bias. Male teachers are more likely to favor students of the same sex than students of the opposite sex; for students, male students are more likely to favor teachers of the same sex than teachers of the opposite sex, and vice versa.

4. METHODS

4.1 Teachers and students

This test mainly tests students' testing scores to show teacher's gender bias effect and how it affects students' performance in Shanghai schools. The higher students'

test scores, the less teachers' gender bias and negative influences on them.

Firstly, this test requires to find the right number of urban and suburban schools—four hundred freshman students in senior high schools in each urban and rural areas (eight hundred students in total); it also needs twenty teachers equally divided between men and women from each rural and urban areas (forty teachers in total). For now, there are 20 teachers teaching 400 freshman students in both urban and rural schools.

All the teachers are new in their seniority in this test, because compared with other teachers, teachers with rich teaching experience may make students' academic performance better, so there will be errors in student achievement caused by different teachers' teaching ability and experience; by setting up new teachers, this error may be reduced.

At the same time, all student required for this test are freshman students. For one thing, students in their third year of high school are about to take part in China's national college entrance exam, so they will not participate effectively in this test while they are preparing for bigger exams. Also, for students in grade two, after a semester of study, they are already familiar with the teacher's teaching methods and build relationships with teachers which means they will not feel any pressure if those teachers show any gender bias to them, making unobvious effect on their academic performances *(Saizi Hu, 2010; Xiaoxia Li, 2016; Tingjun Yong, 2017)*. However, for freshmen of high school, the learning content, learning environment and teaching teachers provided by us are all unfamiliar to them, so they will be very sensitive to the new environment. When teachers show their potential gender bias, students will directly feel, and this gender bias will affect them effectively and directly.

4.2 Teaching groups and content

There will be 20 teachers, 10 male teachers and 10 female teachers will be equally assigned to teach a total of 400 students in each urban and rural schools.

The teaching content for students to learn is an introductory concept to psychology. If choosing to let students learn high school knowledge normally, the factor that students have already preview what they are going to learn before school starts cannot be eliminated, leading to errors on measuring their learning outcomes. Also, for the study of science, different students have different understanding ability and operational level. Therefore, choosing psychology, which is a liberal arts subject, can better eliminate the differences caused by different students' learning level.

During class, all content will be taught in 25 minutes, and teachers must ask 5 different students questions based on their teaching content. At the same time, the whole teaching process of the teacher will be recorded (students and teachers will sign a consent agreement about recording their classes).

4.3 Selection of test taker

4.3.1 Test taker from student

Although teacher's behavior plays significant role on student's academic performance, factors triggered by students' own grade are still having their own influences on students' academic performance. Students in three different grades (grade 10, grade 11, and grade 12) are considered as the test taker.

Firstly, it is not proper to make grade 12 students as the test takers. For one thing, grade 12 students are required to take *Nationwide Unified Examination for Admissions to General Universities and Colleges*; high competition pressure from peers and time taken by exams make them not able to participate in this test. On the other side, these students have already study with their teachers for 3 years (with no change of personnel on teacher), and this long-time companionship is enough for students to build positive relationship and patience with teachers. This test is created to test the influence of teachers' gender bias towards students; however, this relationship and patience will remit impact from gender bias from teacher since students in grade 12 have no longer cared about that and put all their time on studying for exams. Meanwhile, grade 11 students' situation can also apply to this reason.

In another aspect, students in grade 10 is the ideal test taker in this case. As new students in high school environment, difficult course learning, new requirement to expand social circle, and learning convergence between junior high and senior high make these new senior high students sensitive with factors that affect their academic performance, especially factors from teachers; thus, the gender bias caused by teachers towards students are easily to be perceived by grade 10 students.

4.3.2 Test taker from teachers

Despite those factors from students, teacher is the main reason which cause gender bias in class; in this case, proper teacher selection for this test is important. The ideal teacher choice for this test is a beginning teacher who just begin one's job in a new school. This option offers two benefits.

Beginning teachers are lack of teaching experience, so they have not yet mastered the correct way of teaching; thus, instead of eliminating the manifested gender bias with high standard and sophisticated teaching methods like elder teachers, those new beginning teachers are highly likely to express their potential gender bias to their

students, which caused by the tension as a new teacher teaching in class.

Besides, beginning teachers are strangers for test takers in students; therefore, there is no established teacher-student relationship between them. Because of that, teachers are likely to show their gender bias, and students are more likely to perceive gender bias from teachers.

4.4 After course

After all the lessons have been taught, students are required to finish a final exam about their learning content, containing multiple choice and free responses. Students' test scores will be used in t-test and correlation test subsequently.

Then, 10 students from urban area and 10 students from rural area are asked to watch the class records and grade the sexism displayed by the teacher.

4.5 Implicit Association Test

To further develop this test, teacher will be asked to finish gender bias implicit test; then the results from implicit test will be compared with the measurement of gender bias those teachers really show in class, eliminating the deliberate cover-up of their gender bias.

Stereotype Implicit Association Test (IAT) often reflects the strength which one person hold his or her stereotypes [9]. Empirical study has already shown that the IAT has successfully been used to measure implicit gender bias in career and educational roles [10]. We mainly focus on gender stereotypes which reflecting teacher's implicit gender bias for this study. During the Implicit Association Test, teachers are required to complete one implicit test on their gender preference on website *(https://implicit.harvard.edu/implicit/takeatest.html)* [11].

5. CALCULATION

In this study we will use t-test to measure teachers' gender bias towards students.

The t-test can measure the disparity of two groups of data accurately and therefore indicate the occurrence of bias and differentiation [10]. 800 students' scores will be counted as one factor and 20 students' scores on grading the sexism displayed by the teacher will be counted as another factor. Formula is shown below:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\left[s^2 \left(\frac{1}{n_1} + \frac{1}{n_2}\right)\right]}} [12]$$

In this formula, t is the t-value which we finally require, x1 and x2 are the means of the two groups—800 students' scores and the other 20 students scores, s2 is the pooled standard error of the two groups, and n1 and n2 are the number of observations in each of the groups.

In addition to this, the correlation test is used to determine the relationship existence between students' scores and teacher's gender bias toward students. Formula is shown below:

$$r = \frac{\sum(x - m_x)(y - m_y)}{\sqrt{\sum(x - m_x)^2 \sum(y - m_y)^2}} [13]$$

In this formula, r is the final correlation coefficient; x is students' scores, and y is teacher's gender bias; m_x and m_y are the means of x and y variables. The correlation coefficient ranges from -1 to 1; -1 indicates a strong negative correlation: this means that every time x increases, y decreases (left panel figure); 0 means that there is no association between the two variables (x and y) (middle panel figure); 1 indicates a strong positive correlation: this means that y increases with x (right panel figure) [11].

6. CONCLUSION

All results are based on final measurement from t-test and correlation test, basing on the hypotheses in urban area and rural area.

For rural area, the rural students average scores are recorded and the bias between genders are determined through the t-test. The two genders' score are recorded and a greater disparity between the scores is expected, fitting the rural area hypotheses.

For urban area, the urban students average scores are recorded and the bias between genders are determined through the t-test. The two genders' score are recorded and a smaller disparity between the scores is expected.

The correlation tests are used to determine whether the relationship between teachers and the score and times of interaction exists. If the relationship exists t-test is implemented to determine the significance. The data which male teacher ask male students and females is compared and female teacher ask male and female is compared.

Rural and urban students' data is combined and the t-test is used to figure out the significance. The score of female students and the male students are compared.

REFERENCES

[1] Wagner, D. G., & Berger, J. (1997). Gender and interpersonal task behaviors: Status expectation accounts. Sociological perspectives, 40(1), 1-32.

[2] O'Neill, T. (2000) Boys' problems don't matter. Report/ Newsmagazine (National Edition), 27 (15), 54-56.

[3] Heilman, M. E., Simon, M. C., & Repper, D. P. (1987). Intentionally favored, unintentionally harmed? The impact of gender-based preferential selection on self-perceptions and self-evaluations. Journal of Applied Psychology, 72, 62–68.

[4] Sadker, D., & Zittleman, K. R. (2009). Still Failing at Fairness: How Gender Bias Cheats Girls and Boys in School and What We Can Do About It (3/29/09 ed.). Scribner.

[5] Statista. (2021, March 24). Online education platform Tencent Classroom user distribution China 2020, by gender. https://www.statista.com/statistics/1223740/china-online-education-platform-tencent-classroom-user-distribution-by-gender/

[6] Raina, S. (2021). GENDER BIAS IN EDUCATION. INTERNATIONAL JOURNAL OF RESEARCH PEDAGOGY AND TECHNOLOGY IN EDUCATION AND MOVEMENT SCIENCES, 1(02). Retrieved from https://ijems.net/index.php/ijem/article/view/10

[7] Subrahmanian, R. (2005, July 1). Gender equality in education: Definitions and measurements. ScienceDirect. https://www.sciencedirect.com/science/article/abs/pii/S0738059305000349

[8] Gunderson, E. A., Ramirez, G., Levine, S. C., and Beilock, S. L. (2012). The role of parents and teachers in the development of gender-related math attitudes. Sex Roles 66, 153–166. doi: 10.1007/s11199-011-9996-2

[9] Nosek, B. A.; Banaji, M. R.; Greenwald, A. G. (2002). "Harvesting implicit group attitudes and beliefs from a demonstration website". Group Dynamics. 6 (1): 101–115. doi:10.1037/1089-2699.6.1.101

[10] Smyth FL, Nosek BA. On the gender‐science stereotypes held by scientists: explicit accord with gender‐ratios, implicit accord with scientific identity. Front Psychol. 2015;6:415.

[11] Take a Test. (2011). Project Implicit. https://implicit.harvard.edu/implicit/takeatest.html. Copy right 2011

[12] Bevans, R. (2020, December 14). An introduction to t-tests. Scribbr. https://www.scribbr.com/statistics/t-test/

[13] Correlation Test Between Two Variables in R - Easy Guides - Wiki - STHDA. (2020). Statistical Tools for High-Throughput Data Analysis. http://www.sthda.com/english/wiki/correlation-test-between-two-variables-in-r