

# Inequality in the Classroom: The Impact of High School Teachers' Gender Bias on Students' Academic Performance

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## ABSTRACT

Educational equality is seen as an important force in achieving social equality, but what are the implications if education itself is not equal? The experimental study was designed to reveal the effect of teacher gender bias on student academic achievement by analyzing teacher-student interactions in the classroom with 20 teachers and 400 high school students selected from two different districts in Shanghai, China, and divided into 20 groups. This will help to understand that educational inequalities do not only stem from differences in family background, but also exist in the teaching and learning process.

**Keywords:** teacher gender bias; high school students; academic performance; experimental study

## 1. INTRODUCTION

Social equality is a fervent human pursuit, yet inequality is ubiquitous. In many countries, education is seen as an important force for social equality, as it is in China. As a result, education laws as well as classroom norms require that teachers should treat every student equally. From China's Teacher Law to the U.S. No Child Left Behind Act, all require that all students be treated equally. But education is not a clean slate. Racial discrimination and class inequality sting, and people often criticize them at the level of social systems. In contrast, gender inequality in education has long been considered a problem of the family. The gender inequality in education that existed in rural China in the past was seen as a product of parents' preference for sons over daughters.[1][2]

In schools, teachers may also favor some students more than others, although the latter may also perform well. For many years, teachers have been criticized for favoritism, and children who do well academically have been labeled as "teachers' good boys. It is not unreasonable that students who perform well meet the professional goals of teachers and therefore receive more attention from them. But are teachers' preferences based only on students' acquired factors? In other words, is it possible that teachers' bias against students stems from the latter's ascribed factors, such as gender? If so, does gender bias have an academic impact on students? Studying the impact of teachers' gender bias on students' academic performance was the subject of this experimental design.

Teacher expectations may influence student

performance in school. Rosenthal and Jacobson validated this finding in *Pygmalion in the Classroom: Teacher Expectation and Pupils' Intellectual Development*. [3]They outlined this as a mechanism called self-fulfilling of interpersonal prophecies) The gender of the student is one of the many factors that may influence teacher academic expectations[4]. Boys are more likely to perform well in the classroom if teachers perceive them to be superior to girls and vice versa. However, teachers do not want to be labeled as gender biases. In the few relevant studies in China, it has been found that sexism in the teaching field is observable in all aspects of the teaching process, including the choice of teaching methods and the way teachers and students interact and evaluate students. [5][6]Teachers' gender bias shows disciplinary characteristics, with different tendencies in the case of mathematics and English teaching. [7][8]Not only that, school space becomes a site of constructing gender differences, where male teachers and male students use masculine rules and resources to control females and thus gain more educational resources and educational opportunities.[9]Teacher support was superior for boys than girls in positively predicting students' initial levels of flexibility.[10]However, recent studies have also validated the bona fide sexism toward females proposed by Glick and Fiske in China[11], finding that parents and teachers have higher expectations for girls.[12][13]

By analyzing relevant studies in China, there are few empirical studies here. The current studies have only described or verified the existence of gender bias in a general way. This is far from sufficient. Deeper differences among teachers and between schools need to be revealed in order to act more accurately. Therefore,

gender bias and its impact on the educational experiences of adolescents in urban and rural schools in China is a key part of the focus of this study.

## 2. METHODS

### 2.1 Research questions

Adolescence is often compared to the rebellious period in China. Students at this stage struggle to escape the influence of adults (parents and teachers) and become more concerned with peer relationships. [14] Chinese law defines 18 as the age of adulthood, and the six years between the age of 12 and adulthood coincidentally correspond in the school system to middle school and high school. After selection in the middle school examination, senior high school students reach a certain high level of academic achievement and ability. They appear more mature and mentally stable compared to the fragile and fallible nature of the middle school. So, have they been influenced by their teachers to change? There are very few studies and experiments on gender bias in education for high school students in China. Many of the studies are from ten years ago or even earlier, and the situation should be completely different now, ten years later, so there is a great need for research. High school students spend more than ten hours a day at school with their peers and teachers, and it is of interest whether the gender bias of teachers affects their academic performance during their last years before adulthood. Therefore, the first question of this experimental study is whether teachers' gender bias affects high school students? This study was expected to not only focus on gender bias in adolescent education, but also to add to the body of research in this area.

Gender bias has always existed in society before and now in China. In particular, the unequal social status of men and women has been a hot topic. In the old days, women were not qualified to go to school in rural areas and could only depend on marriage and having a son to improve their social status. Due to the development of urbanization, the economic and cultural gap between urban and rural areas has gradually narrowed. But the extent to which the gap has narrowed in terms of social thought is harder to measure. So, go ahead and examine whether gender attitudes in urban and rural schools today are also converging with the process of urban-rural integration?

### 2.2 Participants

The experiment was conducted in one general high school in Shanghai and one in a suburban area of China. Shanghai is a cosmopolitan city with a reputation not only for its economic and social development but also for its basic education, which has been ranked first in the world in the PISA test in 2009 in three areas of education:

mathematics, science, and literacy. However, internal differences still exist, as evidenced by the exchange system of master teachers in Shanghai's primary and secondary schools. While Shanghai does not have the same urban-rural differences as other Chinese provinces, the differences in educational resources and quality between the up-and-coming suburban areas and the established urban centers are well known. Thus, the selection of sample schools from different regions can still reveal urban-rural differences to some extent. Participants in this experiment included 10 teachers and 200 high school students from each of the two high schools. Half of the teachers and half of the students from each school were required to be male or female.

The Code of Ethics for Elementary and Secondary School Teachers (revised in 2008) requires teachers to "treat students equally and fairly," which means without prejudice or discrimination. However, gender bias exists in the classroom. [15][16] Unfortunately, Chinese scholars' research on gender equality is more based on the "should" perspective, while few empirical studies have focused on gender bias and its effects in the classroom. There are many complaints from students or their parents about teacher bias. [17][18] And teachers' eccentricity is reflected in many ways, such as the influence of gender bias in choosing class leaders and subject representatives, and even in ranking positions. Many teachers believe that boys are suitable as natural science class representatives because they are good at this kind of subjects and that girls should sit in the front half of the classroom. [19] To some people, these things are "don't care", but if they affect students' academic performance, it is a social problem that needs attention, which is Micromotivation contributes to macro behavior.

The selection of senior students for this study was based on this consideration. In China, ninth graders are selected to enter their first year of high school through a unified entrance examination in their city or province. The exam is administered by the city or province. Each high school is divided into different levels, and students are admitted in order of their scores. Shanghai's general high schools are divided into five admission batches, with significant differences in admissions scores between batches of schools. However, each school admitted students within a certain score range. This was very useful for this experiment to control for student learning ability variables. From the teachers' side, the senior students were freshmen in the school, they did not have much contact with the teachers at the beginning of their enrollment, and the unfamiliarity between teachers and students helped to avoid the teachers' established impressions of the students and influencing the experimental results.

### 2.3 Design

One high school in each district of Shanghai was

selected as a sample school for this study, and the differences between urban and suburban areas help to compare, to some extent, the gender bias of teachers in different areas and schools. In this study, two schools in Shanghai will be randomly selected with 200 students each, half of whom will be male and half of whom will be female. Since these students had relatively concentrated entrance scores, their intelligence levels were roughly in the same range.

The imbalance between male and female teachers in primary and secondary schools has received much attention in recent years.[20][21] According to the Ministry of Education 2020 education statistics, the proportion of female teachers in elementary schools reached 71.17%, 58.81% in middle schools, and more than half in high schools reached 55.64%.[22]The high school schools were chosen for the sample, again taking into account the gender structure of the teachers, after all, this is where the ratio of males to females is closest to 50/50. 20 teachers were distributed in each 10 in each school, and they were also 50/50 male and female. To control for the effect of the experiment on teachers' teaching experience, teachers aged 30-45 were selected for this study. Because teachers in this age group had some professional experience, they were mostly skilled and mature teachers with relatively stable educational philosophies and teaching styles. They represent the backbone of the school, and their bias or lack thereof will have a more significant impact on the learning and development of the corresponding student population. In China, including Shanghai, there is an emphasis on the role of the "baton" of the college entrance exam. In Shanghai, there are nine Advanced Placement courses, so based on the study design one teacher will be selected from each course and one teacher will be selected for the IT course, for a total of 10 teachers. In addition to this, the structural characteristics of the teachers in the two schools were taken into account to ensure that both male and female teachers were selected for each course after the merger of the two schools. In other words, if a male physics teacher is selected in school A, then a female physics teacher has to be selected in school B. Of course, there are times when a female teacher needs to be identified first for a particular course, especially for natural science classes.

Next, students and teachers will be grouped. 200 students will be divided into small groups of 10 boys and 10 girls, with 20 groups of 20 students each. Twenty teachers will teach each of these groups. The teaching content was a historical story about psychology. The Chinese teacher certification exams and entry exams include knowledge of educational psychology, and the teacher training program offers a special class on educational psychology; therefore, all high school teachers know a little bit about psychology. However, they do not know much about the history of psychology's development. Therefore, they were chosen to control for

the effect of differences in teachers' teaching levels on the experimental data. To ensure that students have no prior exposure to the subject matter, a psychology-related test and a simple questionnaire will be used to exclude some of the "knowledgeable" students until the sample size is reached.

Each teacher will spend 25 minutes teaching the students the assigned content. The lessons will be videotaped in their entirety. History stories are likely to be of interest to students from a variety of backgrounds, avoiding the difficulty of the subject matter and the lack of appeal to students due to the difficulty of the subject matter.

The experiment required each teacher to initiate interaction with students during the class. Interactions included asking questions, walking up to students, gesturing to students to speak, listening to students, making eye contact with students, encouraging or criticizing students, and so on. This is an important action to determine if a teacher is gender-biased. To minimize the impact of student seating on teacher-student interactions, the experimental seating will be purposely designed to have four columns of five students each and to ensure that each student is of different gender in front and behind. For example, the first row of the first column will be female, the second row of the first column will be male, the third row of the first column will be female, and the first row of the second column will be male and the first row of the second column will be female.

Three days after the class, 400 students will take a brief quiz on the content of the class. The questions on the quiz will be drawn entirely from the content of that class. The questions will be in the form of a structured questionnaire that will test the students' memory. Since this study expects to reveal whether the teachers' gender influences their gender bias, teachers will be tested for gender implicit stereotypes after the trial. [23]Finally, data will be cross-tabulated and analyzed with gender bias based on student achievement and the number of teacher interactions in the classroom. The data comes from the analysis and statistics of the video by members of the research team.

Of course, before the experiment begins, all participating teachers and students will be informed that the purpose of this experiment is to study whether high school students adapt well to college psychology-related courses, which can help reduce the experiment being influenced. However, at the complete end of the experiment, all subjects will also know the true research purpose and use of this experiment.

### **3. HYPOTHESIS**

This study explores gender bias and its effects in two dimensions: individual and organizational. The individual dimension takes into account teachers and

students, and the organizational dimension refers to urban-rural differences in schools. There is a long history of gender bias in traditional rural culture, where people are more patriarchal. [24] Even though schools are seen as sacred places where new cultures are spread and where new ideas emerge from time to time, does this bias ironically affect the extended family-like schools as well? If the study variables take into account urban-rural differences in schooling conditions, and rural schools are not as well educated as urban schools, does this mean that rural teachers are also more conservative in their gender perceptions? After all, cities are seen as more open and inclusive places, and they are more attractive to highly qualified people. [25] Therefore, it is first assumed that gender bias is more prevalent in rural schools than in urban areas.

On an individual level, the impact of teachers' own gender on their gender perceptions was first considered. Although gender equality is written into the constitution and has become a basic state policy in China, a patriarchal society is often used as the conclusion or underlying context for many debates about gender. (1) If education is an important way to change people's mindset, do male teachers, who are well educated and have a "vested interest" in a patriarchal society, change their gender perspective? Therefore, it is quite possible to go on the assumption that male teachers are more gender biased than female teachers. All improvements in schools should be aimed at ENHANCING student achievement. [26] This study was not designed to describe the presence or absence of gender bias, but expected to reveal the impact of gender bias on student achievement. Therefore, the third hypothesis is that female students are more susceptible to the effects of teacher gender bias. If the above hypotheses are tested, the findings of the current study will be the conclusions and extended findings related to this. For example, after clustering, gender bias among natural science and humanities and social science teachers might be discussed.

#### **4. ANALYSIS AND DISCOVERY**

In addition to basic data on experimental participants, data on teacher-student interactions and student test scores need to be obtained from the experiment.

Testing the first hypothesis requires assessing gender stereotypes and the number of teacher-student interactions for teachers in each of the two schools. Next, the degree of teacher gender bias is calculated separately for the two schools. That is, this study also needs to discuss and consider some of the following issues: 1. Regarding teacher gender stereotypes, is there an urban-rural difference? This requires measuring the gender stereotypes of male and female teachers in the two schools separately and comparing them. 2. Regarding teacher-student interactions, are there gender differences between male and female teachers within the same

school? That is, do male teachers in the same school favor male or female teachers? What about female teachers? 3. Regarding the inter-school comparison of the effects of gender bias on teacher-student interaction, the differences in the effects of gender bias were compared separately for teachers of the same gender in both schools. Through these analyses and discussions, if the hypotheses are tested, the conclusion will be presented that gender bias is more severe among high school teachers in the suburbs of Shanghai than in the urban areas. This is reflected in the fact that during the experiment, teachers were more willing to give opportunities for interaction to rural boys than to girls. This is reflected in the data that teachers initiate more interactions with boys than with girls. Therefore, the T-Test for boys will form a strong correlation with rural areas. If the hypothesis is not tested, it suggests that there is no urban-rural difference in gender bias.

The gender bias was more severe for male teachers than for female teachers, implying that male teachers in the experiment were more willing to interact with more boys or girls than to balance the number of interactions between boys and girls, whether they were from urban schools or rural areas. This would be reflected in more unbalanced data on the number of interactions for male teachers, with significantly more interactions with students of one gender than the other.

This last hypothesis is reflected in the fact that girls' performance is more likely to be affected by teacher gender bias, regardless of whether they are in rural or urban schools. [27] For example, female students who are high achievers, because of the very strong gender bias of the instructor, do not receive as much attention from the instructor as male students, i.e., they interact with the instructor less than male students. Therefore, in this section, we will track the usual performance of both boys and girls and compare it with the performance of this experimental test to find the changes in girls' performance compared to the usual.

This part is the focus part of the study because the experiment is not just to list the data, but to discover what is behind the data. Therefore, the results of this experiment will be linked to the existing literature to further discuss changing trends in gender bias in the classroom.

#### **5. CONCLUSION**

##### ***5.1 Limitation of study***

Although this study hopes to control for those factors that influence the results, there are some possible risks. First, the content may be beneficial to some students and difficult to arouse the interest of other students. Obviously, those students who are interested are more likely to interact with the teacher, and once the teacher

feels this motivation, the teacher-student interaction may be fixed. After all, teachers are required to interact with students, and when a student takes the initiative, the teacher goes along with it. Also, differences in students' learning styles may influence the teacher's response,[28]some students are significantly more engaged in the classroom. The teacher-student interaction at this point may not stem from teacher gender bias, but rather from the influence of the classroom context.

Second, the diversity of students' family backgrounds may also have an impact on students. How well students adapt and adjust to the teacher's gender bias depends in large part on their own psychological tolerance and in larger part on the economic and social status of their families. Children from families with high economic and social status are less likely to be influenced by these negative biases, thus, attenuating the effects of teacher gender bias.

Third, teachers are likely to deliberately maintain gender equality, for example, by their perceived experimental purpose. Then they may choose to interact with 3 boys and 3 girls in order to maintain gender equality, which will greatly affect the results of the experiment and the accuracy of the data.

### **5.2 Possible future directions**

Therefore, possible future directions of research can be developed based on this deficiency. For example, how do the social background and economic status of the family influence the behavior of students affected by gender bias? Do teachers intentionally maintain gender equality in the educational process, and why and what are the consequences of this intentional maintenance? And how long do these behaviors that can maintain gender equality persist? What factors will be changed and affected? And will teachers' gender be more likely to influence their gender bias? How should gender bias be changed in urban and rural areas? Of course, it would be very interesting to study these research directions, and if future research is needed to select one of them for in-depth study.

### **5.3 Summary**

The conditions for achieving equality in education depend on macro policies. In recent years, China has made good achievements from promoting the balanced development of compulsory education to the balanced development of quality. However, the macrosystem design has focused more on strengthening school construction, improving school conditions, and making school affordable for all school-age children. While these are all so-called equal opportunities, equality in the education process relies on the teachers in the classroom. Their every move directly affects students' performance in school. Empirical research has not paid much attention

to the micro classroom. Therefore, studying teachers' gender bias and its effects is of great interest in China.

This experimental study can provide pragmatic advice to the Chinese basic education system to confront and address the issue of gender bias among teachers, thus promoting more equal education. Machismo is not uncommon in Chinese family life. This can be seen in the "Anti-domestic Violence Law of the People's Republic of China" and "LAW OF THE PEOPLE'S REPUBLIC OF CHINA ON THE PROTECTION OF RIGHTS AND INTERESTS OF WOMEN" shows that women are still at a disadvantage. Likewise, teachers in the classroom do not have equal expectations of students, and girls are more likely to be influenced.[29]Indeed, influenced by factors such as teaching experience, gender, and subject matter, teachers have some degree of gender awareness and respond differently to male and female students [30]

Therefore, gender awareness must be incorporated into the teacher training curriculum, [31]to improve teachers' gender awareness overall, abate the adverse effects of their gender perceptions on the equity of the educational process, and better promote social equality and gender equity.

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