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**Gender Separation in Higher Education;  
Evidence from a Natural Experiment in Iran**

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**Overview**

The long-lasting debates over single-sex education among researchers and scholars have produced inconsistent results, mainly due to methodological issues and selection biases. In addition, there is a dearth of research on the effect of gender separation policy in the context of higher education, as well as in the context of muslim-majority countries. In this paper, using a natural experiment approach, I investigate the effect of gender separation policy in higher education on educational outcomes of students in Iran.

In 2011, the University of Allameh, one of the largest public universities in humanities and social sciences in Tehran, started to separate the classrooms for male and female students, without a pre-announcement to the public. Exploiting such a natural experiment setting, I try to uncover the underlying reason for the ostensibly improving educational outcomes of the students in 2011 cohort, compared to those of 2010 cohort, who studied in coeducational environment.

The findings reveal that separating males and females classrooms, significantly increases educational outcomes of female students by 0.20 standard deviation, while it has no significant effect on males' outcomes. However, future studies are needed to evaluate the impact of the policy on other important outcomes such as the average age of marriage, rate of divorce, time to find a job, wage, and life satisfaction among the students who studied in separated environments.

## **Introduction**

The merits of single-sex education have been fiercely debated by scholars, policymakers, and authorities in education. For a number of decades, the focus of many theoretical and empirical studies has been on the effectivity of gender separation policy in educational contexts (eg. Riordan, 1994; Campbell & Evans, 1997; Hoffman et al. 2008). Whether single-sex education is beneficial to females, males, or a subset of either groups (eg. minorities or certain racial groups), whether it positively or negatively affects each of the specific short-term and long-term outcomes of students, were the most popular questions in the field.

Regarding the effect of gender separation policy on educational outcomes, clear divides have emerged between supporters and critics of the policy; Proponents of single-sex education believe that separating boys and girls increases their academic performances because of the supposedly substantial biological differences between the two sexes (Pahlke et. al., 2014). Additional rationales for the positive impact include notions such as sexism and stereotype threat, particularly against females, and sexual attraction among male and female students as a distraction in coeducational environments (Pahlke et. al., 2014; ). In contrast, opponents argue that learning-related differences among males and females are small and negligible, or even nonexistent (Eliot, 2009; Hyde, 2005). Moreover, they believe that mixed settings reinforce gender-stereotypes, while single-sex environment offers more freedom in exploring interests and abilities, particularly for female students (Billiger, 2009). Opponents also emphasize the opportunities to learn cooperation and tolerance among genders in coeducation (Jackson and Smith, 2000).

Numerous studies on the effect of the policy produced inconsistent results, mainly due to methodological issues and selection biases. The ultimate measures are mostly vulnerable to the criticism that they simply reflect the pre-existing differences between the students who attend each of the educational settings. Some studies used random assignment or controlled for observable factors to rule out alternative explanations for the observed impact. However, there is a dearth of such controlled studies in higher educational contexts (Pahlke et. al., 2014). Furthermore, although single-sex education is more prevalent in Muslim-majority countries, studies investigating the effect of the policy in such contexts are rare. Due to the vast differences in cultural norms and values, results from the evaluation of the policy in western countries are hardly generalizable to Muslim-majority countries. The current research uncovers the causal impact of gender separation policy on educational outcomes of Iranian university students, using a natural experiment approach.

## **Problem Setting**

Shortly after the 1979 Revolution in Iran, the Supreme Council for Cultural Revolution regulated that universities with enough facilities and resources required to offer separated classes by gender. The ratification had not been enacted in universities until 2011; Following a recent resurgence of the debate over single-sex education in Iran, a few public universities initiated to implement gender separation policy at

classroom level. Authorities claim that in single-sex environment, educational outcomes for female students improved as they have more opportunities to express themselves and cooperate in same-sex study groups in the absence of male students. Others are at odds with these views as the positive impact of the policy on educational outcomes has not yet been proved by research. Opponents also weaken the argument for separation by pointing to potentially less-developed social skills of separated students who also studied in single-sex environment in all school years beforehand and had no experience to communicate with the opposite sex in school. They believe that the policy could lead to adverse socio-economic outcomes of the less-socially -developed and -linked graduates of separated universities.

### Methodological Approach

In 2011, one of the most important public universities in Tehran, the largest in Humanities and Foreign Languages -The University of Allameh Tabatabaei- implemented the policy of gender separation at classroom level, *unexpectedly and without a pre-announcement to the public*.<sup>1</sup> The abrupt enforcement of the policy ensured that the students admitted at the University in 2011, did not know that they would attend the lectures and classrooms in the first year of their graduate studies merely with those of their own sex.<sup>2</sup> Exploiting such a natural experiment setting, I try to uncover the effect of gender separation policy at classroom level in universities on students' educational outcomes.

Combining two datasets taken from the University of Allameh, and Sanjesh Organization which holds the National Examination for University Entrance each year, I analyzed the information about 2673 individuals, the two cohorts admitted at the University of Allameh Tabatabaei in 2011 (1238 treated), and the year before, 2010 (1435 control) In order to establish the comparability of the cohorts, I controlled for the potential pre-differences between the cohorts (gender, age, district, field of study, high school GPA, and Konkur test score, and rank) and an institutional characteristics (student-to-professor ratio, male-to-female ratio).

### Findings

A comparison of the means for the first-year GPA of female students nurtures the argument for the supporters of gender separation policy; the mean for first-year GPA of female students significantly increased by 0.26 standard deviation.

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<sup>1</sup> - In order to pursue higher education at a university in Iran, male and female students graduated from high schools have to participate in a National Exam for University Entrance (Konkur), held by the Ministry of Science, Technology, and Research each year. Based on their performance in Konkur, students are then assigned by the Ministry to one of the specific universities in their submitted lists of selected major-university.

<sup>2</sup> - In the subsequent years of study at the University of Allameh, both cohorts participated in single-sex classrooms. Thus, I examine the policy effect only on the first-year outcomes of students.

When controls for students' socio-economic background and high-school GPA are added to the model, the policy does not seem to change males' outcomes, while the effect for females slightly increases (0.28 standard deviation). Controlling for Konkur test score as an incoming ability measure instead of the high-school GPA increases the effect of the policy to nearly 0.35 standard deviation. Given that the distribution of students' abilities in the two years is the same, I also controlled for students' ranks in Konkur to account for possible differences in the level of difficulty of Konkur Examination. In this case, the policy turned out to positively affect the outcomes of female students by 0.2 standard deviation, while the impact on males' GPAs was insignificant. Finally, a more comprehensive model, which accounts for all individual characteristics and educational competencies of the students, and institutional traits such as student-to-professor ratio, reveals that separating males and females classrooms, significantly increases educational outcomes of female students by 0.20 standard deviation, while it has no significant effect on males' outcomes. Ironically, coming from a more religious family seems not to affect the impact of the policy on educational outcomes.

### **Policy Implications**

Although in this paper, the policy of gender separation at universities turned out to positively affect educational outcomes of female students, the causal impact of the policy is still controversial, and the question whether the government should widen the scope of the policy in terms of the number of public single-sex universities or mixed universities with separated classrooms, is still open. Future studies are needed to evaluate the impact of the policy on other important outcomes such as the average age of marriage, rate of divorce, time to find a job, wage, and life satisfaction among the students who studied in separated environments.

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