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Do Gender Influence Salary Raise?

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Do Gender influence the Number of Publications and Salaries of Faculties?

In modern day society, gender inequality is an important subject matter to recognize and address. The discrimination based on gender is present in almost every aspect of society. One specific example is the differences in salaries of faculty members in the University system. According to a publication by the *American Sociological Association*, "the larger the college or university, the greater the difference between average male and female wages" (Pamela S. Tolbert, 1986). This indicates that there are persisting prejudice of salaries by gender. From this, we can expect the number of years working, separated by the factor of gender should produce a significant difference in the raise of salary.

Another important factor influencing salary and promotion decisions is the number of publications (David A. Katz, 1973). If this is the case, gender bias can further place females in an unfair position. According to a research in the *American Sociological Review*, there is a devaluation of work that is performed primarily by women (Marcia L. Bellas, 1994), making it a difficult workplace for females. Although more females are starting to work at Universities over the past 40 years, the number of years they have worked will not yet be enough to amount to male's (Marcia L. Bellas, 1994). A hypothesis derived from such background indicates that number of publications are also strongly influenced by gender.

Method

Participants

A random sample of 100 faculty members, 55 males and 45 females from different departments and universities within California are included in this study. There are 4 variables used, of which two are continuous variables; The faculty member's annual salary from 2014 and

2015 and the number of years the faculty member has been a faculty member. The third variable is a categorical variable with 0 indicating males and 1 indicating females. The fourth variable is the faculty member's average number of publications per year.

The mean salary in 2014 is $100,502.30 (SD=15,454.16) and in 2015 is $101098.60 (SD=15,450.02). The range of the salary for 2014 is from $60,336 to $133,884 and for 2015 is $60,860 to $134,528. The mean salary for both male and female during 2014 is $100,500. The mean salary for female and male during 2015 is $101,100. The second variable, years on the job, has an average of 13.11 years and a range from 1 year to a maximum of 23 years. The average number of publications by males are 2.4 and 2.8 for females.

Procedure

One hundred faculty members from universities within California were selected randomly to participate in this study. The faculties were randomly selected, therefore, are from varying departments and universities. Data were collected from different members of faculties through the years of 2014 to 2015. Faculties were asked to participate through online surveys that consisted of 20 questions including the amount of salary during the year 2014 and 2015.

Data Analysis

In order to compare the two means of the various variables, a dependent and an independent t-tests were used. For the differences in salaries by the number of years working as a faculty member, a dependent two sample t-test was used to compare the means of salaries by years of work. A dependent sample t-test was used because the salary in 2014 is dependent of salary in 2015. An independent two sample t-test was used to compare the means of number of publications by gender. Independent t-test was used in this case since the number of publications and gender are independent of each other, in another words, they do not rely on each other.

Results

The result of the dependent sample t-test testing the differences in 2014 salary and 2015 salary is with test-statistic of ($t(99) = 123.73$, $p < 0.05$, $SE = 4.819622$). The interpretation of p-value $p < 2.2e\text{-}16$ indicates that if we consider the dependence between salary vs. salary_2 conditioned by the years on job to be non-existent, the chance of observing our data or more extreme is close to 0%. Since p-value < 0.05, we reject the null hypothesis and conclude that the differences in salary from 2014 to 2015 is dependent on years on the job.

An independent sample t-test is conducted to test the hypothesis for number of publications vs. gender. The test statistic is such that ($t(98) = 1.7953$, $p > 0.05$, $SE_{X-Y} = 0.222804$). The interpretation of the p-value = 0.07568 is that if the null hypothesis is true, we will observe our data or more extreme with the probability of 7.568%. Since p-value > 0.05, we fail to reject the null. This indicates that the mean difference of publications by gender is not significant, therefore the number of publications are independent of gender difference.

The sample size for male faculty members are 55 while there are 45 female faculties with (mean=2.6, $SE_{pooled}=0.1121524$). From this, we can also conclude that the number of publications does not differ by gender since the standard deviation for male given number of publication is 1.05 and for female is 1.18.

Discussion

The purpose of examining this data set was to analyze if the gender difference caused significant differences in salary. The hypothesized statement was that the years on the job causes the salary to rise faster, and that gender predicts the number of publications. The results of the

independent t-test and dependent t-test was such that the years on the job does cause the salary to rise faster but there were no gender differences in the amount earned. Also the results indicated that gender do not predict the number of publications.

The results were interesting since it showed us that gender differences do not effect the overall amount of salary change. The indifference in the number of publication might also infer that both gender has equal opportunity to conduct a research and successfully publishing it. When the mean salaries were compared between genders, the results were such that there was no significant difference between genders. Results from this analysis might imply that gender bias throughout Universities' workforce has diminished over the years.

Nonetheless, we cannot conclude with absolute certainty that gender equality has been achieved with such limited information. More data from schools from different areas of U.S. and of different factors should be collected to evaluate the different factors that might influence the change in salary for university faculties.

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