Gender, Confidence and the Workplace

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ABSTRACT

Dr. Geraldine Perriam from the University of Glasgow in conjunction with the non-profit organization, My Confidence Matters, conducted a study on confidence levels of women in the workforce. A finding of this study indicated that over 73% of women surveyed felt they lacked confidence on a regular basis. (Perriam, 2018)

Using questions on the same spectrum as this survey, researchers wanted to survey a multinational population of both dominant genders to see if the differences were significant.

Author Keywords

Confidence; gender; workplace; workplace dynamics; management; leadership

INTRODUCTION

As stated in the introduction to *The Status of Women,* "Women's status in the United States consistently lags behind men's." This is seen in a disparity of earnings, trickling down to increased poverty rates and adverse health conditions. Additionally, women and female people of color continue to be underrepresented in political offices across the country at every level. (Childers, 2018)

Upon reviewing the literature concerning women in the workplace, investigators came across the Perriam study from the University of Glasgow that analyzed confidence levels of women in the workplace and they wanted to conduct a very similar study to both working men and women to see how significantly they differed. Investigators propose investigating these two hypotheses:

H_0:	There is no significant difference of confidence levels between genders.
H_A:	There is a significant difference of confidence levels between genders.

STUDY DESIGN

In this experiment, our population of interest is all adults above 18 years of age. The sample is adults who have had experience with a full-time job, in any job field.

This is an observational study, with no random assignment, where respondents were asked to answer a few questions regarding gender, age, race, confidence in work space and how they think they could improve their skills that would help them be more confident. The sample observations in this experiment are independent since it is a simple random sample and consists of fewer than 10% of the population. The parameters of this study would be mean and standard deviation of confidence scores across genders in the population. The statistic test used will be Z scores.

From the survey, the independent variables are '*Age* ', '*Gender*', '*Race*' and '*Ethnicity'* and the dependent variables are all other remaining variables such as '*In the Past Year, How Frequently Would You Say You Lacked Confidence At Work?' etc.*

VARIABLES SCALE OF MEASUREMENT

As part of the survey, investigators have eight questions for the participants to answer and questions range from demographics, as is the case for Questions 1-4 and questions 5-8 were from the Perriam study (Perriam, 2018). The variables and their corresponding scale of measurement are as described below:

Note: No questions on this survey were mandatory. All respondents were able to skip any question(s) they liked.

1. Age, Ordinal, Continuous. 18-24, 25-30, 31-35, 36-40, 41-45, 46-50, and 51 and above.
2. Gender, Nominal. Female, Male, Non-binary/ third gender, Prefer not to say, Prefer to self-describe
3. Race, Nominal, American Indian/Alaskan Native, Asian, African American, Native Hawaiian/Pacific Islander, White, Multiracial
4. Ethnicity, Nominal, Are you of Hispanic or Latino origin? Yes or no
5. In the past year, how frequently would you say you lacked confidence at work? Ordinal, Never, Rarely, Once or twice a month, At least once a week, Every day

6. In the past 30 days, which of the following challenges stopped you from making the impact you wanted at work? Ordinal, Appearing confident but not feeling confident, Forgetting what you were going to say or waffling, Managing a negative mindset eg why should someone listen to me? Knowing how best to structure a speech or presentation.
7. What typically makes you nervous at work? Nominal, Requesting a pay rise, Standing in front of an audience, Networking, Intimidated by boss or colleagues, Competing with colleagues, Chairing a meeting
8. If you wanted help with building up your confidence at work, what services would you find useful? Nominal, Bitesize online courses, Being part of a community, One-day bootcamp, One or two day workshop, One-to-one coaching, Other.

DATA COLLECTION

As of the time of this writing, our research group has 466 survey respondents. A demographic breakdown is as follows:

Age: This variable was skewed slightly to the right but is also the one whose data closest resembles a normal distribution. 28.3% (n=132) of respondents were in the middle-age group, between 35-44 years old. (0 respondents skipped this question), 127 respondents were from the 25-34 age bracket and 94 were from 45-54 age bracket.

Race: The largest racial groups represented were from white and Asian people, making up 85% (n=394) and 8.6% (n=40) of the respondents, respectively. (1 respondent skipped this question) . The dominant age bracket (35-44 years old) had 130 female responses out of which 73% were white and 4.6% were of Asian and African American origins respectively with 17 male responses which had 76.4% white respondents and 15.3 % responses from people of Asian and African American origins respectively.

Ethnicity: 96% (n=442) of respondents were not Hispanic. (5 respondents skipped this question) .

Gender: 77.4% (n=359) of respondents were female and 20.0% (n=93) were male. Researchers will run samples on both of these groups for our project's main analyses. Additionally, 2.1% of respondents identified as non-binary or third gender. (2 respondents skipped this question)

POSSIBLE BIASES

Researchers received an overwhelming amount of data from white females in their mid-thirties and early-forties. Approximately 20% of our data came from all of these demographics combined. There are clear biases on gender, race and ethnicity as described in the "data collection" portion. Because of this, the researchers may not be able to do a more in-depth intersectional analysis of the data to see how gender *and* race impact confidence levels but T-Tests can be conducted given the smaller sample sizes. ("What is intersectionality, and what does it have to do with me?," 2017)

In hindsight, the researchers asked questions with the assumption that respondents would definitely have confidence issues or struggle with confidence at work. The questions didn't take the idea into account that people may not have any confidence issues at work or at all. The goal is to determine if there is an association between gender and confidence levels at the workplace.

DESCRIPTIVE STATISTICS OF THE VARIABLE RELATED TO CONFIDENCE LEVELS

The variables of interest for the purpose of the study are "What is your gender" and "*In the past year, how frequently would you say you lacked confidence at work?*" The latter is originally nominal but is converted to a numeric scale of 1 to 5 for the analysis. The distribution of the responses based on gender of the participants can be seen in the below graphs:

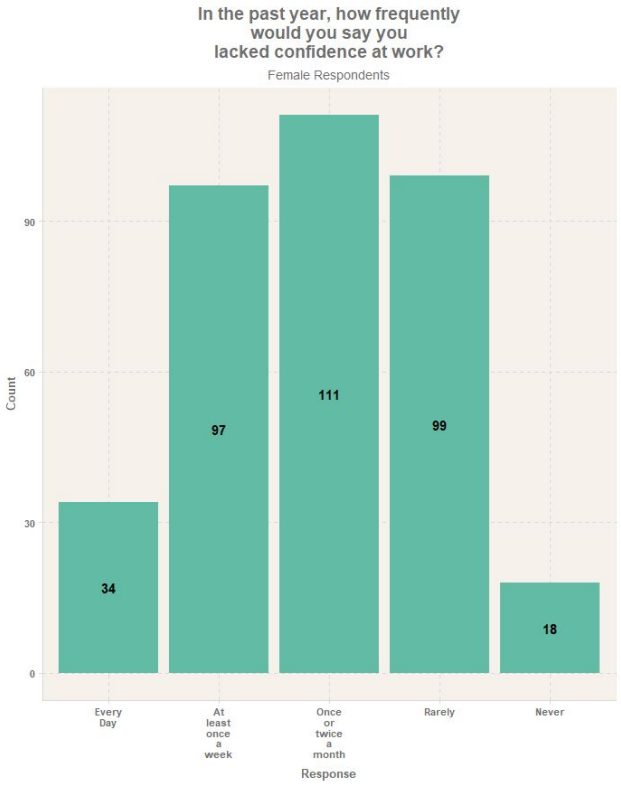

Figure 1: The above graph shows the distribution of responses for the females in the dataset.

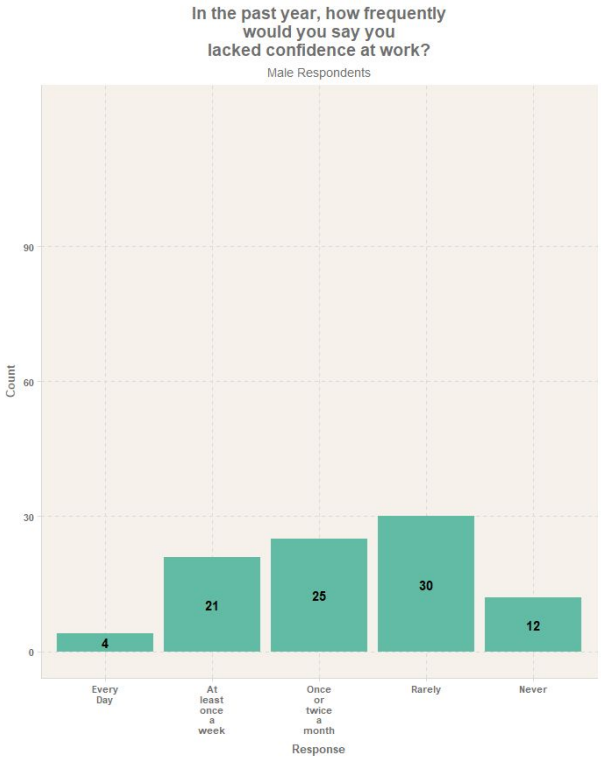

Figure 2: The above graph shows the distribution of responses for the males in the dataset.

Investigators found the descriptive statistics of the variable "*In the past year, how frequently would you say you lacked confidence at work?*" after converting it into a numeric scale of 1 to 5 by using the summary() command in RStudio. Subsets were made by gender. Summary statistics are below:

Sample	Mean	Median	SD	1st Quart.	3rd Quart.
Full Survey	3.026	3	1.07	2	4
Male Subset	2.728	3	1.09	2	4
Female Subset	3.084	3	1.06	2	4

Figure 3: Descriptive statistics of the variable "*In the past year, how frequently would you say you lacked confidence at work?*"

THE TWO-SAMPLE T-TEST

The statistic test run was a two-sample t-test as the data satisfied the following conditions:

1. Independence within groups and between groups.

2. No extreme skew in either group.

Investigators compared and contrasted or questions and how they might be interpreted by various users taking the survey. For example, the most common response to the question, "*In the past 30 days, which of the following challenges stopped you from making the impact you wanted at work?*" was "*Forgetting what you were saying or waffling*", as selected by 159 females, 5 Non-Binary people and 31 males and the second highest response was "*Appearing Confident but not feeling confident*" selected by 130 Females, 27 males and 5 Non Binary people. Another important question asked was, "W*hat typically makes you nervous at work?"*. The various options provided had included '*asking for a pay-rise.*' As indicated in a study conducted by an editorial in the United Kingdom, more than a third (35 percent) of respondents of their survey said they lack the confidence to ask for a pay rise, and a quarter (25 percent) fear asking their line manager for time off and this is because of low confidence in their skill sets.[8] In the survey question, 160 females (80% respondents) 35 males (17.5% respondents) selected that option, which was a contributing factor in this study's hypothesis creation and analysis.

Investigators wanted to find if a correlation exists between confidence levels and gender, the explanatory variable is "What is your gender?" and the response variable is "*In the past year, how frequently would you say you lacked confidence at work?*". We chose this response variable after much deliberation.

In order to run the two-sample t-test with the two sample groups, i.e., Males and Females, two subsets from the dataset for Males and Females. were created. Since 93 males and 359 females in the survey dataset, random sampling was conducted from the subset of females to get three random samples of 93 females each. Researchers performed the 2-sample t-test with the males' sample and each of the three females' samples with 93 observations each. Therefore, the total number of t-tests is three.

The results of the 2-sample t-tests for the three groups of samples can be summarized in the following table:

Group Number	T Value	DF	P Value
1	2.062	182.67	0.020
2	2.435	182.07	0.008
3	3.065	182.45	0.001

Figure 4: The above figure summarizes the results of the 2-sample t-tests among the three groups of male and female samples

INTERPRETING THE TWO-SAMPLE T-TEST

From the table in Figure 1, we can observe that the p-value is less than the significance level of 0.05 in all three tests. As a result, we reject the null hypothesis. We can conclude that there is a difference in the confidence levels of males and females and males have higher confidence levels than females. Hence, the myth is confirmed.

EFFECT SIZE AND POWER

The effect size can be calculated by using the formula: Cohen's d:

$$\text{Cohen's D} = \frac{X_{men} - X_{women}}{\sqrt{\frac{SD_1^2 + SD_2^2}{2}}} = \frac{2.728 - 3.084}{\sqrt{\frac{1.09^2 + 1.06^2}{2}}} = 0.34$$

The result was 0.34 which is a small effect size.

Power can be calculated using the pwr.norm.test() command in RStudio and we get the following values for different values of the effect size :

For d = 0.2, power = 0.488
For d = 0.4, power = 0.972
For d = 0.8, power = 1

WEAKNESSES IN THE ANALYSIS

Observational research involves the direct observation of individuals in their natural setting. As such, who does or does not receive an intervention is determined by individual preferences, practice patterns, or policy decisions[7]. Therefore, it cannot be established that a causal relationship exists between gender and confidence levels. The final analysis may have been affected by a small sample size as compared to the population. Response biases between ethnicity and genders, which are some of the confounding variables.

There is a possibility of a convenience bias as the researchers reached out to participants accessible on social media. The sample, therefore, is not representative of the population. Also, the female respondents in the survey far outnumbered the male respondents which called for the need to create random samples of the female subset. Additionally, investigators could not perform any analysis related to confidence levels with the participants who identified as the third/non-binary gender or preferred not to reveal their gender due to very limited amount of data available. (10 and 2 respectively out of a total of 466 responses).

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