

# AN ECONOMETRIC INVESTIGATION OF ATTITUDES TOWARD SEXISM

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*Addressing direct and indirect forms of discrimination towards women in the workplace and beyond continues to represent a struggle for policy makers. In this econometric investigation, Gillian O'Connell examines the determinants of a belief that sexism is indeed a persistent problem. She finds that gender and education have a statistically significant effect on attitudes as well as personal experience of discrimination at work and political affiliation. Exploring a wealth of future research possibilities in this area, this paper adds to the discourse on the factors underlying attitudes towards sexism and policies surrounding it*

## Introduction

The past century has seen huge political and social changes in the position of women in society. To illustrate the magnitude of these changes consider the United States, which will be the focus of this paper. In 1912 women in the US could not vote or own property and they worked, with very few exceptions, in the home. Clearly huge improvements have been made since then, with many of the institutional barriers having been removed.

However despite the magnitude of these changes the progress that has been made, sexism is a continuing feature in modern society. A 2009 report by the International Trade Union Conference found that the average global gender pay gap is 17% with a range of 3% to 51% (ITUC, 2009). In many parts of the world institutional barriers to female empowerment remain in place, while in more western countries, which have by and large made huge progress, more subtle forms of discrimination persist.

These inequalities must continue to be addressed at all levels of society and for this to take place there must be acknowledgement that gender inequality is a continuing problem; people need to think that there is a problem if they are to take action against it. In light of this need for awareness, understanding the beliefs people hold and why they hold them is important. Shedding light on which characteristics of an individual might determine these beliefs is crucial as it is by understanding this that one can seek to change people's attitudes and promote further equality in society.

People's responses to sexism will be determined by their attitudes towards it, and these depend on whether or not it is perceived as an issue in society. This paper will seek to identify some of the determinants of whether or not people believe that women

experience discrimination in the United States today. This question is an important one because understanding who holds certain beliefs, and what causes them to do so, will facilitate the design of more effective interventions targeting behaviour change.

## Literature Review

To investigate the determinants of people's beliefs and attitudes about sexism, we need to understand how attitudes are formed. According to findings from social psychology people construct their attitudes based on three sources of information; cognitive, affective and behavioural. Cognitive information is what we know about the attitude object, affective information is how we feel about it and behavioural information is knowledge about our own and other people's interactions (both past and future) with the attitude object. The weights given to these sources of information vary depending on the individual, their experiences and the attitude object in question, however each source of information plays a role in any given attitude (Smith and Mackie, 2007).

Research about sexism has largely focused on the determinants of sexist behaviour, rather than an awareness of sexism as a problem. However attitudes and behaviour are closely linked as, wherever possible, people seek to act in a way that is consistent with their attitudes, as incongruence between attitudes and behaviour produces a state of uncomfortable mental tension (Gawronski, 2012). Given that this required congruence is bi-directional<sup>1</sup> we can look at literature on the determinants of sexist behaviour and assume that they will also have an effect on people's attitudes.

One factor, which is frequently found to have an effect on sexist attitudes and behaviour is education. A study by Glick and colleagues (2002) found that level of education is negatively correlated with people's willingness to endorse both hostile and benevolent sexist beliefs, explicitly demonstrating that education has an effect on how people respond to sexism.

In general, literature on sexism takes the view that it is socially constructed and focuses on broader social patterns and how these might affect people, rather than more micro-level individual experiences or characteristics. The validity of this approach is not in question but if we are to affect change in individuals' attitudes – which have already been shaped by social forces - it is also important to consider individual determinants, which this paper will seek to do.

## Model

In order to determine what might cause an individual to believe that sexism is a continuing problem in society the following model is specified:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \beta_7 X_{7i} + \beta_8 X_{8i}$$

Where the variables are as follows:

$Y_i = SOC\_EQUAL$  - a binary dummy variable which take on a value of 0 if the individual responds that men and women are treated equally to the question "*Do you think society generally treats men and women equally, or does it favour women over men, or men over women?*". It take on a value of 1 if the respondent says men are favoured over women and a value of 0 if the respondent says men and women are treated equally

$X_1 = AGE$  - a continuous variable measuring the age in years

$X_2 = SEX$  - a binary dummy variable which takes on a value of 0 if the individual is male and 1 if they are female

$X_3 = EDU$  - a binary dummy variable which takes on a value of 0 if the highest level of education achieved by the individual is a High School Diploma or less. It takes a value of 1 where they have pursued tertiary education

$X_4 = DISC\_WORK$  - a binary dummy variable which takes on a value of 1 if the individual indicated that they have been discriminated against in the workplace on the basis of their gender. It takes a value of zero if this was not the case

$X_5 = DIFF\_OCC$  - a binary dummy variable which takes on a value of 0 if the individual believed that pay discrepancies between men and women were the result of men and women having different occupations and a value of 1 if they responded that this is not the case

$X_6 = DIFF\_HOURS$  - a binary dummy variable which takes on a value of 0 if the individual believed that pay discrepancies between men and women were because men and women work different hours, and 1 if they responded that this is not the case

$X_7 = DEMO$  is a dummy variable which takes on a value of 1 if the individual identified themselves as a democrat and 0 otherwise

$X_8 = REPUB^2$  - a dummy variable which takes on a value of 1 if the individual identified themselves as a republican and 0 otherwise

## Empirical Approach

The key thing to note about this model is that the dependent variable is binary and this places limitations on how the model can be estimated. We are interested in the  $P(y=1 | x)$ , or the probability that an individual believes that sexism is an issue in society, given the explanatory variables. One possible estimation technique would be the Linear Probability Model (LPM), which uses OLS estimation procedures to estimate the model where the dependent variable is the response probability and is linear in the parameters  $\beta_j$ . However, the use of LPM in estimation raises a number of issues, the most serious of which being that, where our dependent variable is a probability we require that  $0 \leq \hat{Y}_i \leq 1$ , but under the LPM there is no reason for this to be the case.

This model will therefore be estimated using a probit regression, which takes the form

$$P(Y=1 | X)=\phi(Z), \text{ where } Z=\sum_{k=0}^j X_{ij} \beta_j$$

and  $\phi$  is the cumulative distribution function (CDF) for the normal distribution. Imposing the CDF on the model ensures that all values of the dependent variable will fall within the desired range (Wooldridge, 2014).

### Data and Expectations

Data for this study was taken from a survey on Gender, Higher Education and Work carried out by the Pew Research Centre (2014). The survey was carried out by telephone interviews (both landline and mobile) in October 2013. The sample is made up of 2,002 people, aged over 18 and resident in the United States.

The dependent variable was taken from a survey question “Do you think society generally treats men and women equally, or does it favour women over men, or men over women?” to which there were four possible responses; men and women equally (=1), women over men (=2), men over women (=3) and don’t know/refused (=9). The research question for this paper is concerned with attitudes people hold regarding inequality involving discrimination against women. It intends to determine the factors underlying the belief that sexism is indeed a problem. Respondents who indicated that they believe women are favoured over men are an interesting group that merit discussion, but are beyond the scope of this paper, which seeks to identify characteristics of individuals who believe that discrimination against women is a problem. The independent variables discussed here might also play a significant role in determining why people believe women are favoured over men, but other factors would need to be considered.

Therefore, in order to obtain a binary dependent variable, respondents who indicated that they did not know (and therefore held no belief) and those who believed that men are unfairly treated were dropped from the dataset. Table 1 gives the frequencies of each of the four possible responses, with the dropped respondents (2 and 9) making up a small but not inconsequential percentage of the data.

<i>*Do you think society generally?*</i>	<i>Frequency</i>	<i>Percent</i>	<i>Cumulative</i>
1	780	38.96	38.96
2	174	8.69	47.65
3	924	46.15	93.81
9	124	6.19	100
<i>Total</i>	<i>2,002</i>	<i>100.00</i>	

Table 1

Most of the survey questions took a similar form to the dependent variable question, with participants asked to respond either “yes” or “no” or presented with a

limited choice and asked to respond “1 if ...,” “2 if...,” etc. Thus, the explanatory variables estimated in the model are dummy variables. These explanatory variables examine whether education, political ideology, experience of workplace discrimination and the rationalisation of examples of inequality as benign contribute to the probability that an individual believes sexism to be an issue in modern American society and are summarized in Table 2.

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Min</i>	<i>Max</i>
<i>AGE</i>	1,704	44.14319	19.47314	18	99
<i>SEX</i>	1,704	.4876761	.4999948	0	1
<i>EDUCATION</i>	1,704	.6971831	.4596116	0	1
<i>DISC_WORK</i>	1,674	.1356033	.3424692	0	1
<i>DISC_OCCUPATION</i>	1,704	.2975352	.4573081	0	1
<i>DIFF_HOURS</i>	1,704	.4906103	.5000586	0	1
<i>DEMOCRAT</i>	1,704	.3080986	.4618431	0	1
<i>REPUBLICAN</i>	17,04	.2470657	.4314319	0	1

Table 2

*AGE* is not expected to have a statistically significant effect and is included as a control variable in order to reduce omitted variable bias.

*SEX* is expected to have a positive effect, as it seems reasonable to expect that the probability that a woman, who experiences sexism, will believe it to be present will be higher than the probability of man doing the same.

*EDUCATION* is expected to have a positive effect as pursuing post-high-school education might lead to a greater awareness of current events, and perhaps lead an individual to take a more critical view of society, thereby increasing the probability that they will believe sexism to be present.

*DISC\_WORK* is expected to have a positive effect on  $Y_i$ . Of the respondents who reported that they had been discriminated against based on their gender, 69% were women and we, therefore, expect that experiencing discrimination in the workplace increases the probability of  $Y_i$  being equal to 1.

*DIFF\_OCCUPATION* and *DIFF\_HOURS* are both expected to have positive effects on  $P(Y = 1)$ . Where these dummy variables are equal to zero, people are attributing inequality in the form of pay differences to choices that women make. This is consistent with the idea of rationalising evidence which contradicts beliefs to achieve cognitive consistency. When people do not think that these differences are voluntary, they may be more likely to believe sexism is a problem in society.

The variable for *DEMOCRAT* and *REPUBLICAN* measures the effect of these ideologies, relative to someone who identifies as an Independent. Given that the Democrat party is generally associated with socially liberal positions and the Republican party with more traditional and conservative values, we expect to see a positive effect on  $P(Y_i = 1)$  for

DEMOCRAT and a negative effect for REPUBLICAN.

### Empirical Results

The results of the probit estimation, which is carried out using STATA, are presented in Table 3. The command probit gives the probit coefficient estimates and standard errors, which can be used to cWomment on the direction and significance of the relationship between  $X_j$  and the dependent variable. From Table 3, we can see that the effects of AGE, DIFF\_HOURS and REPUB on SOC\_EQUAL are not statistically significant.

As was expected SEX, EDU, DISC\_WORK and DEMOCRAT each have a positive effect on P(Y=1) and each of these effects are significant at the 1% level. DIFF\_OCCU also has a positive effect, with a 10% significance level. We can therefore say that being female, having post-school education, experiencing discrimination at work and not attributing pay differences to different occupations all increase the probability that an individual believes that sexism is present in society.

Variables	SOC_EQUAL
AGE	0.000764 (0.000658)
SEX	0.119*** (0.0252)
EDUCATION	0.133*** (0.0273)
DISC_WORK	0.121*** (0.0362)
DIFF_OCCUPATION	0.0503* (0.0287)
DIFF_HOURS	0.00921 (0.0263)
DEMOCRAT	0.220*** (0.0276)
REPUBLICAN	-0.0159 (0.0313)
OBSERVATIONS	1674

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 3.

We can see from the likelihood ratio chi square statistic and its associated p-value, which are presented in Table 4, that the model is significant at the 1% level, meaning that it is explaining some of the variation in the response probability. The pseudo R<sup>2</sup> is 0.0681, meaning the model explains 6.81% of this variation. While this is low, given that this

model dealt only with workplace discrimination and excluded violence, harassment and other forms of sexism which may be encountered, this relatively low pseudo  $R^2$  is not surprising, especially considering that much of what determines attitudes and beliefs is largely unobservable (e.g. cultural learning and affective responses).

Number of Observations	1,674
LR Chi-Squared (8)	157.15
Prob > Chi-Squared	0.00
Pseudo $R^2$	0.0681

Table 4

In order to comment on the magnitude of the effects the STATA command `dprobit` must be used. Using `dprobit` gives the maximum likelihood estimates of the marginal probability effects of the explanatory variables, in other words it gives the effect of each  $X_j$  on the probability that an individual believes sexism is present in society. Using `dprobit` instead of `probit` doesn't have an effect on standard errors or significance levels; these are as they were in Table 3. The marginal probability effects of the explanatory variables are presented in Table 5. Because the explanatory variables are dummy variables, the marginal probability effects are interpreted as the effect of  $X_i=1$  on  $P(Y=1)$ , all else being equal.

Variables	<i>SOC_EQUAL</i>
<i>AGE</i>	0.000764 (0.000658)
<i>SEX</i>	0.119*** (0.0252)
<i>EDUCATION</i>	0.133*** (0.0273)
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Standard errors in parentheses  
 \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 5.

## Possible Extensions

The data used in this paper is drawn from an American sample and therefore this discussion and the findings of the model can only be applied to western society. This is because the factors that determine the attitudes people hold and the ways in which these attitudes are expressed are, to a huge extent, culturally determined, and therefore seeking to extend the above beyond Western culture would be inaccurate and misleading. Caution should also be employed when considering these findings as they relate to non-US Western countries as there will exist cultural differences, however given the America's cultural hegemony it should be possible to apply these findings, as long as it is done so in a manner mindful of possible differences. Given this, the first area suggested for future research would be to examine whether the determinants of beliefs about gender (in) equality might be different in non-western cultures, an area of particular importance given the more entrenched and institutional forms of discrimination women in many of these cultures face.

Secondly, in order to work with a binary dependant variable respondents who indicated that society favours women over men were dropped from the data to facilitate the desired analysis for this paper. A full understanding of attitudes towards gender in society must also consider this alternative perspective and so future research should seek to identify those who believe this to be the case, and why they do so.

The model here found that tertiary education had a significant, positive effect on the dependent variable. However the quantifying of education here was imprecise as the dummy variable  $X_3 = 1$  included everything from third level certificates to PhDs. In order to better understand the effect that education has on this belief, it might be worthwhile to look at whether the type of education pursued has an effect or whether it might be attributable to the duration of education.

Finally, a significant positive effect was found for *DISC\_WORK*, suggesting that people who experience gender based discrimination in their workplace are more likely to think it is a problem in society. It would be interesting to examine whether discrimination must be personally experienced to have an effect, or whether seeing instances of it would have the same effect and an investigation into this possibility would potentially yield valuable insights for attitude change.



## References

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## Notes

1 - Just as people need to behave in manner consistent with their attitudes they also need to hold attitudes which are consistent with how they behave.

2 - In the survey people were asked to classify themselves as Republicans, Democrats or Independents. Independents are used as the baseline category they are taken to be the most central, and so it allows us to more clearly analyse the effects of more polarised beliefs, be they left or right wing.