Title: Extension to "How Unequal Wages, Unfair Procedures and Discrimination Affect Labor Supply: Experimental Evidence"

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Abstract

We present here an extension of our experiment (entitled "*How Unequal Wages, Unfair Procedures and Discrimination Affect Labor Supply: Experimental Evidence*" in the AEA RCT Registry (ID: AEARCTR-0002655)). Our research is extended on two fronts: (1) negative gender discrimination without chances involved, and (2) positive gender discrimination of women without chances involved. We investigate the causal effect of wage inequality due to gender discrimination on labor supply decisions of workers. We conduct an experiment on an online platform, where workers individually engage in the same task and are individually paid a piece-rate wage. Workers receive information about their own wage and the wage of another worker as well as on the procedure leading to these wages. A worker's labor supply decision only affects himself or herself. Providing less labor reduces the worker's earnings but leaves unaffected the other workers' earnings.

Design Summary

In the online experiment, participants will work individually on a repetitive task under different payment schemes. Each participant will decide on how much he or she works during at most 70 minutes. The task is to copy given lines consisting of random letters and numbers by typing them on their computer. Each participant individually receives a piece-rate wage per line correctly entered. A participant knows that the lines entered do not affect other participants' earnings and are of no further use to the researchers.

Before starting to work, participants receive information about their own piece-rate wage, the piece-rate wage of another worker, and the procedure leading to these piece-rate wages. Participants only go through one payment scheme. In this extension, we always implement unequal wages, and the payment schemes constitute our treatments. The treatments are:

(1) Unequal wages (U): one worker receives a high wage and the other receives a low wage and gender of the other worker is not revealed,
(2) Unequal wages with implicit discrimination (UID): one worker receives a high (low) wage and the other, whose gender is revealed (and is of the opposite gender), receives a low (high) wage,
(3) Unequal wages with explicit discrimination (UED): one worker receives a high (low) wage and the other receives a low (high) wage, explicitly based on gender.

We measure participants' labor supply by the number of lines that they enter. We then compare their labor supply at a given piece-rate wage across payment schemes. These treatments allow us to investigate the effect of gender discrimination in terms of wages instead of gender discrimination in the chances leading to wages, which we studied in our initial experiment. Moreover, they allow us to consider a more subtle form of discrimination in addition to overt discrimination. We target 1590 participants online (530 in each treatment). Each treatment aims to contain 50% men and 50% women.

Hypotheses

Based on literature showing that discrimination is associated with serious negative consequences on well-being as well as on the results of our initial experiment, we posit that workers dislike unequal wages generated by gender discrimination compared to unequal wages generated by an unknown process. That is, we assume that the presence of gender discrimination reduces the marginal utility from work. The UID payment scheme generates some uncertainty over whether we implement gender discrimination, which we hypothesize will create less disutility than knowing for certain that there is gender discrimination. In contrast, UED makes it clear that there is gender discrimination. We therefore predict that UID produces a greater labor supply than UED. This generates Hypothesis 1a, which concerns low-wage workers at the aggregate level.

Hypothesis 1a (Low-wage workers): Among low-wage workers, labor supply ranks across payment schemes as follows: U > UID > UED.

For a low-wage worker *i*, we have

$$L_i(w_L, w_H, \text{U}) \;>\; L_i(w_L, w_H, \text{UID}) \;>\; L_i(w_L, w_H, \text{UED}),$$

where $L_i(w, w', T)$ denotes the labor supply of worker *i* if the wage of *i* is w, the wage of the other worker with whom worker *i* is paired is w' and the treatment is T.

While results of our initial experiment support the existence of a specific effect of discrimination at the aggregate level, once we account for gender, the effect of negative discrimination on low-wage workers' labor supply is driven only by women (it is insignificant for men). A possible reason for this is that, since in society discrimination is generally experienced by women rather than men, women could be more sensitive to it and men's reaction to women being favored over them might be milder because discrimination favoring women might be seen as compensating women for current labor market inequality. We provide Hypotheses 1b and 1c that specify that the effect is present for women, but not for men.

Hypothesis 1b (Low-wage female workers): Among low-wage female workers, labor supply ranks across payment schemes as follows: U > UID > UED.

For a low-wage female worker *f*, we have

$$L_f(w_L, w_H, \text{U}) \;>\; L_f(w_L, w_H, \text{UID}) \;>\; L_f(w_L, w_H, \text{UED}).$$

Hypothesis 1c (Low-wage male workers): Among low-wage male workers, labor supply ranks across payment schemes as follows: U > UID > UED.

For a low-wage male worker *m*, we have

$$L_m(w_L, w_H, \text{U}) \;=\; L_m(w_L, w_H, \text{UID}) \;=\; L_m(w_L, w_H, \text{UED}).$$

Furthermore, Hypothesis 1d states that unequal wages based on negative gender discrimination exert a stronger negative effect on women than on men, compared to unequal wages based on an unknown source. It is again based on our initial experiment's findings. Note that this hypothesis does not necessarily require 1b and 1c to hold in order to be correct.

Hypothesis 1d (Negative discrimination of men and women): In UID and UED joined together, discrimination against women decreases low-wage female workers' labor supply more than discrimination against men decreases the labor supply of low-wage male workers, compared to unequal wages based on an unspecified source in U.

For a low-wage female worker *f* and a low-wage male worker *m*, we have

$$L_f(w_L, w_H, \text{U}) \; - \; L_f(w_L, w_H, \text{UID or UED}) \; > \; L_m(w_L, w_H, \text{U}) \; - \; L_m(w_L, w_H, \text{UID or UED}).$$

Results of our initial experiment suggest that there might be an exception to dislike for gender discrimination when it comes to women's preferences for positive discrimination of women. In fact, positive discrimination of women might increase their labor supply, possibly because it corrects the existing disadvantage against them in labor markets. In light of this, we predict that, unlike other types of gender discrimination, positive discrimination of women will increase women's labor supply. In contrast, consistent with a dislike for gender discrimination, we predict that men will decrease their labor supply if they are positively discriminated at the expense of women.[1] These predictions translate into Hypotheses 2a and 2b.

Hypothesis 2a (Male high-wage workers): Among male high-wage workers, labor supply ranks across payment schemes as follows: U > UID > UED.

For a high-wage male worker *m*, we have

$$L_m(w_H, w_L, \text{U}) \; > \; L_m(w_H, w_L, \text{UID}) \; > \; L_m(w_H, w_L, \text{UED}).$$

Hypothesis 2b (Female high-wage workers): Among female high-wage workers, labor supply ranks across payment schemes as follows: U < UID < UED.

For a high-wage female worker *f*, we have

$$L_f(w_H, w_L, \text{U}) \; < \; L_f(w_H, w_L, \text{UID}) \; < \; L_f(w_H, w_L, \text{UED}).$$

Our final hypothesis, Hypothesis 2c, states that women increase their labor supply more than men when positively discriminated because of their gender. Note that 2a and 2b do not necessarily need to be correct for this hypothesis to be confirmed.

Hypothesis 2c (Positive discrimination of men and women): In UID and UED joined together, discrimination in favor of women increases low-wage female workers' labor supply more than discrimination in favor of men increases labor supply of low-wage male workers, compared to unequal wages based on an unspecified source in U.

For a high-wage female worker *f* and a high-wage male worker *m*, we have

$$L_f(w_H, w_L, \text{UID or UED}) \; - \; L_f(w_H, w_L, \text{U}) \; > \; L_m(w_H, w_L, \text{UID or UED}) \; - \; L_m(w_H, w_L, \text{U}).$$

[1] Results of our initial experiment show a qualitative (but statistically insignificant) decrease in labor supply for positively discriminated men.

Exploratory Section: We analyze the relationships between answers to post-experiment questions and labor supply. Notably, we analyze the correlation between (1) belief that gender discrimination was used and labor supply inside treatments, (2) previous experience of being discriminated because of one's gender and labor supply reaction to gender discrimination, (3) attitude toward gender discrimination and labor supply reaction to gender discrimination.

Analysis Plan

Hypothesis 1a: We use an OLS or Tobit regression (depending on censoring). We will first jointly test the equality of labor supply in the three payment schemes involving low-wage workers. Then, we will test individually the three pairwise equalities of the conditions correcting for multiple comparisons. We also will perform robustness checks with a similar non-parametric analysis: we first jointly test the equality of labor supply in all conditions using a Kruskal-Wallis test, and we test pairwise equality of the conditions using Dunn's test correcting for multiple comparisons.

Hypothesis 1b: Same approach as for hypothesis 1, for female low-wage workers.

Hypothesis 1c: Same approach as for hypothesis 1, for male low-wage workers.

Hypothesis 1d: We use an OLS or Tobit regression (depending on censoring) with low-wage workers, and test the equality of the equation against our hypothesized inequality.

Hypothesis 2a: Same approach as for hypothesis 1, for male high-wage workers.

Hypothesis 2b: Same approach as for hypothesis 1, for female high-wage workers.

Hypothesis 2c: We use an OLS or Tobit regression (depending on censoring) with high-wage workers, and test the equality of the equation against our hypothesized inequality.

Note: we employ one-sided tests (whenever possible) for our directed hypotheses.

Exploratory Section: To analyze correlations between answers to post-experiment questions and labor supply in a treatment, we employ the Pearson correlation and the non-parametric Spearman correlation. To analyze the relationships between these answers and the labor supply reaction to discrimination compared to other treatments, we use an OLS or Tobit regression (depending on censoring).