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Choice, Discrimination, and the Motherhood Penalty

Tamar Kricheli-Katz

Recent studies have documented substantial penalties associated with motherhood and suggest that discrimination plays an important role in producing them. In this article, I argue that the degree to which motherhood is conceptualized as a choice affects the penalties associated with making this choice. Two methods are employed to evaluate this argument. The first method is an analysis of state differences in the wage penalties for motherhood, in which hierarchical linear modeling is used with data from the 1988–2004 Current Population Survey. The second method is a hiring experiment in a highly controlled setting. The wage analysis shows that, net of the usual individual and state-level factors that affect wages, mothers are penalized more in states where motherhood is perceived to be a woman's choice. The hiring experiment distinguishes between productivity-based and discrimination-based explanations for the penalty and provides strong evidence for a causal relationship between perceptions of choice and discrimination against mothers.

Mothers are disadvantaged in the labor force. In the U.S., they face a wage penalty of approximately five percent per child (Anderson et al. 2003; Budig and England 2001; Waldfogel 1997a, 1997b) and discrimination in hiring and promotion (Correll et al. 2007). Several studies have shown that cultural expectations of the "good mother" are antithetical to expectations of the "ideal worker" (Blair-Loy 2003; Correll, Benard, and Paik 2007; Hays 1996; Ridgeway and Correll 2004). Good mothers are expected to be devoted primarily to their dependent children. Ideal workers, however, are expected to be available and committed primarily to their work and are therefore assumed to have no care responsibilities (Acker 1990). This contradiction causes mothers to be evaluated as less productive and less competent workers (Correll, Benard, and Paik 2007; Ridgeway and Correll 2004; Williams 2000) and, therefore, to be discriminated against in the allocation of jobs, wages and promotions

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(Correll, Benard, and Paik 2007). But is discrimination against mothers greater when motherhood is perceived as a "choice'?

Americans value choice (Iyengar and Lepper 1999; Markus and Schwartz 2010; Ryan and Deci 2000). Research has shown that autonomy, agency and the freedom of choice enhance Americans' intrinsic motivation and mental health, generate greater persistence, increase performance, and lead to higher satisfaction (Langer and Rodin 1976; Patall et al. 2008; Ryan and Deci 2000; Schulz 1976). These positive outcomes are the result of sociohistorical processes in which notions of choice, individualism and control have been reinforced by social and political institutions, social interactions, and the media (Markus and Kitayama 2003).

However, beliefs about control, choice and autonomy can sometimes generate negative societal consequences. In a recent group of studies, Savani et al. (2011) show that the mere activation of the concept of choice leads Americans to perceive disadvantaged individuals as responsible for their own condition, regardless of the social circumstances. In the study, research participants who were exposed to the idea of choice tended to blame victims more often and to feel less empathy toward them. Activating the concept of choice also decreased support for policies that benefit others or society at the cost of individual freedom.

Studies have shown that in the context of less individualistic cultures, agency, independence and control have a lesser effect on the perception and behavior of individuals (Markus et al. 2006; Savani et al. 2008). For example, in the same group of studies, Savani, Stephens, and Markus found that the activation of the concept of choice did not decrease Indians' empathy for disadvantaged people (i.e., empathy for a poor child in an impoverished region of the world). This finding suggests that in some less individualistic cultures, choice is less often associated with responsibility and that the consequences of activating the concept of choice are culturally specific.

In this article, I study the potentially negative consequences of beliefs about choice and control in the context of labor force discrimination against mothers. I test whether the degree to which motherhood is conceptualized as a woman's choice affects the penalties associated with becoming a mother. I propose that when a situation is perceived as controllable, the moral judgment associated with that perception leads to discrimination. Thus, mothers who are perceived as having more control over their status as mothers are penalized more than mothers who are perceived as having less control. Two methods are employed to evaluate this argument. The first method is an analysis of state differences in the wage penalties for motherhood, in which hierarchical linear modeling is used with data from the 1988–2004 Current Population Survey. The second is

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a hiring experiment in a highly controlled laboratory setting. The wage analysis is designed to test whether mothers experience greater penalties in states where motherhood is perceived to be a woman's choice. The experiment is designed to distinguish between productivity-based and discrimination-based explanations for these penalties and determine the causality between the perception of choice and discrimination. The two studies are designed to supplement each other and to provide evidence for the theoretical framework. Although a comparison between the choice-based culture of the U.S. and other, less individualistic cultures would be of great value, it is beyond the scope of this article.

Motherhood as a "Status of Choice"

Over the last several decades, significant demographic shifts have affected the institution of motherhood. Among American women aged 40 to 44, the level of childlessness increased from 10% in 1980 to 20% in 1998. Over the same period of time, the birth rate declined, motherhood became less associated with marriage, and childbearing was delayed. The pursuit of career aspirations and educational goals by women is one reason for this delay in childbearing (Dye 2008). These demographic changes suggest that motherhood is increasingly perceived as a "status of choice." In other words, in the past, most women eventually became mothers; today, because more women do not become mothers, motherhood is increasingly viewed as a choice that women have the freedom to make.

These changes to the perception of motherhood may affect the ways in which mothers are viewed as well as whether discrimination against mothers is perceived to be justified. That is, the more motherhood is viewed as a choice that women have, the more employers may assign responsibility to women who choose to become mothers. Under these conditions, labor force discrimination against mothers may be perceived to be more justifiable than if motherhood is perceived to be outside a woman's control.

Choice, Responsibility, and Discrimination

Some social statuses and conditions are perceived as more controllable than others. For example, whereas gender, race, and age are generally not perceived to be caused and controlled by individuals, people are perceived to have more control over their parental and marital statuses. Research suggests that individuals assign responsibility and moral judgments to undesirable events that are believed to be within the control of the person to whom that event

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occurred (Crocker et al. 1998; Weiner 1995). If we perceive that individuals have *chosen* a path that has led to unfortunate life circumstances (such as illness, poverty, etc.), then we are more likely to view them as responsible for their condition and thus to judge, reject, dislike, and negatively treat them (Weiner et al. 1988). Conversely, if we believe that a situation is uncontrollable, that belief does not lead to a perception of personal responsibility for that situation.

Similarly, studies have shown that we tend to judge victims when they avoid influencing negative situations and overcoming barriers to success; conversely, we praise people for exhibiting agency and control (Markus and Kitayama 2003; Markus et al. 2006; Savani, Markus, and Conner 2008). For example, in a recent study, survivors of Hurricane Katrina were judged negatively when they chose not to evacuate (Stephens et al. 2009).

Like with negative situations, we are also less likely to judge and react negatively to individuals with undesirable traits when these qualities are due to circumstances outside their control. For example, the belief that one's weight is controllable and results from a lack of willpower is strongly associated with disliking the obese (Crandall and Biernat 1990, 1994). Similarly, empirical research suggests that the more people believe that sexual orientation is biologically determined (and not an individual choice), the more likely they are to hold positive attitudes toward gay people (Aguero and Byrne 1984; Whitley 1990).

Several questions arise. For instance, what is the effect of assigned responsibility and moral judgment on discrimination and inequality? Are gay men discriminated against more when sexual orientation is perceived to be a lifestyle choice rather than when it is understood to be biologically determined? Are obese individuals discriminated against less when obesity is believed to be genetic and, therefore, outside their control?

Scholars have yet to address the relationship between negative reactions to certain choices and the discrimination against those who are perceived to have made those choices. Nonetheless, it seems that the moral judgment associated with perceptions of choice may serve as justifications for discriminatory behaviors. The following model was developed by two psychologists, Crandall and Eshleman (2003), and provides insight into the processes through which perceptions of choice and controllability may lead to discrimination. Crandall and Eshleman propose that discrimination is generated by two factors: (1) an automatic primary prejudice that is both genuine and powerful, and (2) a lack of motivation to control the genuine prejudice. In this model, the expression of genuine prejudice is restrained by beliefs, values, and norms. Prejudice is therefore expressed only when justifications (such as ideologies or stereotypes) legitimize its release.

The stigma and the normative evaluations associated with the perception of traits and situations as controllable can justify prejudice. Choice-based perceptions and ideologies may justify the release of the suppressed prejudices and lead to discrimination. For example, an employer may believe that mothers, on average, are less committed and less productive than non-mothers. However, the employer's beliefs and norms regulate the expression of prejudice and may restrain her from discriminating against mothers. The perception of motherhood as a woman's choice may provide the employer with normative justifications for the expression of prejudice. If this is indeed the case, it follows that mothers who are perceived to have had more control over becoming mothers will face greater penalties than mothers who are perceived to have had less choice.

In a recent study, Stephens and Levine (2011) provide partial empirical support for the argument that perceptions of choice are associated with the expression of discrimination against mothers. They show that, when led to believe that women choose to "opt-out" of the labor force and to favor their families over their careers, research participants tended to express the view that opportunities in the labor force are equal and that gender discrimination is nonexistent.

Discrimination against mothers operates differently than discrimination against gay men and obese individuals. Whereas obese individuals and gay men suffer most from negative stereotyping, motherhood is perceived by many to be a socially desired trait that is associated with many positive characteristics, such as kindness and generosity. However, negative stereotypes do affect mothers in the workplace, especially when their productivity and job commitment are evaluated. Mothers are expected to prioritize their children over their work and to exert less effort and energy at work (Blair-Loy 2003; Correll, Benard, and Paik 2007; Hays 1996; Ridgeway and Correll 2004). As a result, mothers are perceived to be less productive and less committed compared to other workers, even when they are equally as productive as non-mothers (Correll, Benard, and Paik 2007; Ridgeway and Correll 2004). In the context of motherhood, perceptions of choice legitimize the expression of negative stereotypes against mothers *as workers* and generate labor force discrimination.

Perceptions of Choice and Differences between States in the Motherhood Wage Penalty—A Quantitive Analysis

If perceptions of choice do indeed lead to discrimination, we should expect that cultural perceptions of the degree of choice

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related to motherhood will affect labor force discrimination against mothers. In cultures where motherhood is perceived as a choice, employed mothers are more likely to be judged by employers and therefore to be discriminated against. When motherhood is perceived to be less of a choice, women face less judgment for becoming parents and are therefore penalized less. Hence, we should expect the motherhood wage penalty (i.e., the wage gap between mothers and non-mothers) to vary across U.S. states and to be greater in states where motherhood is perceived to be more of a woman's choice.

This hypothesis may appear to be counter-intuitive. States in which motherhood is perceived to be more of a woman's choice tend to be more liberal, in general, and people in them tend to hold more egalitarian beliefs. The argument presented here, however, suggests that net of the effect of egalitarian cultural climates, the perception of motherhood as a choice generates labor force discrimination against mothers.

Research suggests that when men become fathers, they are viewed as providers rather than as primary caregivers. Hence, unlike women, men are not disadvantaged for being fathers rather, sometimes it works to their advantage (Correll, Benard, and Paik 2007). For this reason, I do not predict that men will be penalized when parenthood is perceived to be a choice but rather that they will benefit from such perceptions. Because different mechanisms may be involved in individuals' reactions to the "right choices" of the respective sexes, I limit the analysis in this research to women only.

Differences between U.S. States

The motherhood wage penalty has been the focus of several cross-national studies. These studies show that wage penalties vary significantly across countries and indicate that work-family policies may contribute to these differences (Harkness and Waldfogel 2003; Misra, Budig, and Moller 2007; Sigle-Rushton and Waldfogel 2004). However, variations in wage penalties between states in the U.S. have not been fully explored. I analyze differences in the motherhood wage penalty across states in the U.S. to test the hypothesis that the more motherhood is perceived to be a woman's choice, the greater the penalties associated with becoming a mother.

Ideally, direct evidence for inter-state variations in the public perception of motherhood as a choice would be used to predict differences in the motherhood wage penalty. Such attitudinal data are unavailable at the state level. Therefore, I use three measures as proxies for the perception of motherhood as a choice (in a given

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state in a given year). The first measure taken is the percentage of women who are not mothers, as this reflects attitudes toward motherhood. The fewer the women with children, the more that motherhood is perceived to be a choice. The second and third measures are the legal abortion rate and abortion funding polices for low-income women. The abortion discourse in the U.S. emphasizes individual rights, agency, control and autonomy and is less focused on gender rights than that of other countries (Ferree et al. 2002; Papanek 1994). Pro-choice policies are justified by the notion that women should have the right to choose motherhood. Thus, greater abortion rates and liberal abortion policies reflect a society in which women are perceived to have control over their reproductive decisions. In other words, higher abortion rates and pro-choice funding polices suggest cultural climates in which motherhood is perceived as a woman's choice.

This is not to imply that employers are aware of the percentage of non-mothers in their respective states, the specific abortion rates or the abortion policies in those states, or that they consciously draw on these facts when evaluating job applicants who are mothers. Rather, the argument is that abortion policies reflect the broader cultural context and that this context, in turn, influences the content and nature of the policies (Mezey 2001). Thus, the percentage of women who are not mothers, abortion rates and abortion policies reflect the ways in which motherhood is perceived within each state, and that these broader general cultural perceptions influence the behaviors of individual employers.

Data and Methods

I use IPUMS-CPS data from 1988, 1992, 1996, 2000, and 2004. The IPUMS-CPS is an integrated dataset of 46 years (1962–2007) of the March Current Population Survey (CPS). The CPS is conducted jointly by the U.S. Census Bureau and the Bureau of Labor Statistics. Analysis is limited to election years, since election results are used as one of the control variables (see below). Because I am interested in how women's wages are affected by the perception of motherhood as a choice, the sample includes only women. For the same reason, unemployed and self-employed women are omitted.[1] The sample consists of 161,666 women.

Variables

I predict that the more motherhood is perceived to be a choice that women have, the greater the wage penalties for mothers will

[1] Women may become self-employed or unemployed due to discrimination against mothers. Thus, excluding them from the sample may downwardly bias how women's wages are affected by the perception of motherhood as a choice.

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be. Therefore, the dependent variable is the natural log of the respondent's hourly wage, which was calculated by dividing the total annual earnings expressed in 1980 U.S. dollars by the total number of annual hours of work. To estimate the net effect of state abortion policies on the motherhood wage penalty, I use independent variables at two levels. The first level is the individual woman, whose wage is the dependent variable. The second level is the state-year in which the individual woman resides (e.g., Alabama in 1992).

At the individual level, the independent variable is the status of motherhood, which is captured by a dummy variable for being a woman with her own child (who is less than 18 years old) in the household.[2] I use a dummy variable for being a mother, and not the number of children that a woman has. While research has shown that more children increase a mother's wage penalty (Budig and England 2001), it is not clear whether beliefs about choice would generate greater discrimination against women who have more children. Because the main purpose of this research is to document the phenomenon of choice-based discrimination against mothers, I use a simple dichotomous distinction between mothers and non-mothers and leave more nuanced hypotheses for future research.

At the state-year level, I use three alternative measures as explanatory variables. All three are proxies for the perception of motherhood as a choice. The first measure is the percent of non-mothers of all women aged 16–40.[3] A non-mother is defined as a woman who does not live with her own child (the child being less than 18 years old) in the household. For each state in a given year, the percentage of non-mothers was calculated using the IPUMS-CPS dataset.

The second measure is the legal abortion rate per 1000 women aged 15–44. Note that after "*Roe v. Wade*," any woman in the U.S. may abort her pregnancy for any reason until the fetus becomes viable (410 U.S. 113 [1973]). Data were obtained from publications of the Alan Guttmacher Institute. The third measure is public

[2] The original variable in the IPUMS-CPS dataset counts the number of children residing with the parent, regardless of the child's age. The measure includes step-children and adopted children as well as biological children. I used these data with a variable that reports the age of the youngest child (if any) residing with each mother to create a dummy variable for a mother living with a child less than 18 years old.

[3] The percentages of childlessness in a state are measured here for all women aged 16–44. Because most women will become mothers after the age of 16, differences in the rates of childlessness between states reflect the pervasiveness of childlessness and the average age at first birth. The higher the average age at first birth in a state, the higher the percentage of non-mothers aged 16–44. However, because employers cannot distinguish between non-mothers who will later become mothers and those who will not, and because delayed childbearing is itself associated with the perception of motherhood as a choice, this is not expected to bias the results.

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funding for abortions for low-income women. The use of federal funds to fund abortions for low-income women is prohibited under the Hyde Amendment, which was first passed by Congress in 1976, except in cases in which the life of the mother is in danger and in cases of rape or incest. Some states, however, provide nonrestrictive state funding for abortions for low-income women either through legislation or consequent to judicial rulings. Thus, states vary in their provision of nonrestrictive funding for abortions for low-income women. A binary variable indicates whether the state provided nonrestrictive funding for low-income women in the observed year. Data were obtained from publications of the Alan Guttmacher Institute.

Note that I use abortion rates and policies as measures but do not use access to birth control because of the contentious nature of abortion politics in the U.S. and the direct framing of the discussion around ideas of choice and autonomy.

At the individual level, I control for variables that have been previously shown to affect women's wages (Anderson, Binder, and Krause 2003; Budig and England 2001; Waldfogel 1997a, 1997b). I include marital status, captured by a dummy variable that indicates whether the respondent is married or not; age in years, including a squared term; race, captured by a dummy variable for being black and a dummy variable for "other race" (i.e., non-white); and the highest level of education completed, captured by a dummy variable for graduating from high school and a dummy variable for graduating from college. Additionally, I control for the following set of labor force variables: occupational categories using the 1950 Census occupational classification, a dummy variable for work in the public sector and a dummy variable for part-time employment status.

The IPUMS-CPS data does not include years of work experience. Thus, the models do not control for the effect of work experience on women's wages. Past research has shown that women's work experience tends to affect their wages, so that the more years of experience that women have, the greater their wages are (Budig and England 2001). I address the possibility that the percentage of non-mothers, the legal abortion rate and the public funding for abortions for low-income women are all correlated with women's work experience (at the state-year level) in the discussion of the limitations of the wage analysis.

At the state-year level, I control for the presidential election results (to better assess the public opinion, I use the popular vote). I do so to distinguish the effect of the perception of motherhood as a choice from the effect of general liberal and egalitarian attitudes on the wages of mothers. As explained above, my argument is that, net of the effect of egalitarian cultural climates, the perception of

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motherhood as a choice generates labor force discrimination against mothers. In fact, I expect liberal and more egalitarian attitudes to be associated with less prejudice against mothers and to therefore *decrease* the penalties paid by mothers in the state (net of the effect of the perceptions of motherhood as a choice). Note, however, that more liberal states may also have more family-friendly labor markets that support the employment of mothers. Such policies may encourage more mothers to participate in the labor force and thus reduce the selection of mothers into the labor force. A great proportion of mothers in the labor force (and not only the most skilled) may increase the wage differences between mothers and non-mothers. Thus, the effect of liberal egalitarian attitudes may be moderated by the selection of mothers into the labor force.

In addition, at the state-year level, I control for variables that have been previously shown to affect the wages of mothers and to create cross-national variations in the gender wage gap.

Furthermore, I control for the size of the public sector, which is captured by the percentage of the labor force employed by public institutions. Many of the job opportunities in the public sector are in female-type jobs that have mother-friendly, convenient working conditions with flexible employment hours and programs that tolerate paid absenteeism (Esping-Andersen 1990; Kolberg 1991). These convenient work conditions appeal to mothers, thereby attracting them to the public sector. Because public sector employment offers lower relative wages compared with the private sector, a large public sector may increase the wage differences between mothers and non-mothers. The labor force participation rate of women and the representation of women in professional occupations may be correlated with the success of women in the labor force and with their productivity. It thus may affect the wage differences between mothers and non-mothers. Therefore, I include the percentage of women aged 16 years and older in the labor force and the percentage of women in professional occupations. In addition, I include the state's GDP (in 1,000,000,000s of current U.S. dollars) and the percentage of the labor force in professional occupations. Finally, the wage differences between mothers and non-mothers may be affected by the dispersion of women's wages within a given state. Therefore, I also control for the wage ratio between employed women at the 90th and the 10th percentiles of the wage distribution in a state in a given year.

Note again that due to data constraints, a mother is defined here as a woman with her own child (less than 18 years old) in the household. Thus, mothers of older children (with or without children in the household) are coded here as non-mothers. However, having children who are older than 18 years old may affect

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women's wages both directly, through discrimination, and indirectly, through trajectories of past discrimination. Thus, I expect that the estimates of the penalties for mothers would be greater if women of children older than 18 were treated as mothers. Nevertheless, because this article focuses on the effects of state policies on wage penalties and not on the magnitude of the penalties themselves, these differences in coding should not bias the results.

Method

Because the question of interest involves three levels of analysis (individual women nested within state-years nested within states), I employ hierarchical linear models (HLM). This statistical procedure allows for the estimation of the effects of state-year characteristics (the percentage of non-mothers in a specific state and year, for example) on individual-level wages while controlling for variations at all three levels (Bryk and Raudenbush 1992). The first level is the level of the individual woman, whose wage is the dependent variable. The second level is the level of the state-year in which the individual woman resides (e.g., Alabama in 1992). The third level is the state level. This three-level model can be represented by the following set of equations:

$$(log\ hourly\ wage)_{ijk} = \beta_{0\,jk} + \beta_{1\,jk}\,(mother_{ijk}) + \beta X + \varepsilon_{ijk} \qquad (1)$$

At the individual level, the dependent variable is the log hourly wage of an individual woman, i, in a state-year, j, and a state, k. β_{0jk} is the intercept. "Mother" denotes whether the individual woman is a mother (coded as 1). The coefficient β_{1jk} $mother_{ijk}$ represents the average motherhood wage penalty within a state-year. The vector X denotes the individual-level control variables (e.g., marital status, education and age). ε_{ijk} is the level-one random effect. The model allows the level-one intercept and the motherhood coefficient to vary across state-years (i.e., to be random), whereas the effects of all of the other variables are fixed across state-years.

At the second level, state-year level characteristics (e.g., the percentage of non-mothers in a specific state and year) explain these random effects, as presented in Equations 2 and 3:

$$\beta_{0\,jk} = \gamma_{00k} + \gamma_{01k}\,(Choice) + \gamma Z + \delta_{0\,jk} \qquad (2)$$

$$\beta_{1\,jk} = \gamma_{10k} + \gamma_{11k}\,(Choice) + \gamma Z + \delta_{1\,jk} \qquad (3)$$

In Equation 2, γ_{00k} denotes the intercept for a state-year in a state k. *(Choice)* represents one of the three proxies for the perception of motherhood as a choice, and γ_{01k} denotes its coefficient. The vector Z denotes the state-year control variables (e.g., GDP, percent of the labor force in the public sector, the 90–10 ratio). δ_{0jk} is an error

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term. Likewise, in Equation 3, the vector Z denotes the control variables, and δ_{1jk} is an error term. γ_{11k} denotes the coefficient for the effect of one of the three measures of the perception of motherhood as a choice in a given year, for the level-one effect of being a mother. This allows me to test the research hypothesis. In this equation, a negative value for γ_{11k} indicates that the motherhood wage penalty increases when the choice measure increases (e.g., the motherhood wage penalty increases when the percentage of nonmothers increases in a state in a given year). The third level is the state level. Modeling state-years nested within states enables me to control for the unobserved and unchanging characteristics of states. In other words, I test the effects of the three measures on the wages of women and on the motherhood wage penalty and control for other unobserved and unchanging effects related to the states" characteristics. Therefore, I model the level-two intercepts as random so that they are permitted to vary across states. The level-three model is as follows:

$$\gamma_{00k} = \rho_{000} + \mu_{00k} \tag{4}$$

$$\gamma_{10k} = \rho_{100} + \mu_{10k} \tag{5}$$

Where ρ_{000} and ρ_{100} are the level-three intercepts for the level-two coefficients, and μ_{00k} and μ_{10k} are the error terms. All five equations are estimated simultaneously.

Results

Tables 1 and 2 present descriptive statistics for the individual-level variables used in the analysis. The final dataset includes 161 666 women nested within 250 (5*50) state-years that are nested

Table 1. Means and Standard Deviations for Individual-Level Variables Used in the Analysis, CPS 1988, 1992, 1996, 2000, 2004

Hourly wage**	6.37 (6.22)
Mother	0.42
Married	0.55
Age	38.73 (13.00)
Black	0.10
Other race (non-white)	0.05
High school	0.35
College	0.54
Part time	0.26
Public administration employee	0.05
Number of observations	161,666

Notes: *"Mother" indicates a woman with her own child (less than 18 years old) in the household.

**Expressed in U.S.$ (1980).

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Table 2. Means and Standard Deviations for State-Year Level Variables Used in the Analysis: CPS 1988, 1992, 1996, 2000, 2004

Variable	Description	Mean
Percent non-mothers	Percentage of non-mothers of all women aged 16–40*	46.28 (4.35)
Abortions per 1,000	Legal abortion rate per 1,000 women aged 15–44	18.66 (8.49)
State funding for abortions	A binary variable for whether the state publicly funds abortion	0.29
Percent professionals	Percentage of the labor force in professional occupations	0.20 (0.03)
Percent public administration	Percentage of the labor force employed by public institutions	0.06 (0.02)
Percent women professionals	Percentage of women in professional occupations	0.23 (0.04)
GDP	Gross domestic production (1,000,000,000s in current U.S. dollars)	159.99 (202.64)
Labor force participation	Percentage of women 16 years old and over in the labor force	0.59 (0.05)
90–10 ratio	The ratio of average wages of the top 10% of earners to the wages of bottom 10% (only women)	4.60 (0.49)
% Margin for the Democrat party	Margin for Democrats in popular vote	–2.92 (15.10)

Notes: All variables are measured annually, by state.
*"Mother" indicates a woman with her own child (less than 18 years old) in the household.

within 50 states. In most state-years, public funding for abortions for low-income women is not provided and election results tend to be more conservative.

Table 3 displays the coefficients from the multivariate analysis. Models 1, 2, and 3 examine the effects of the percentage of non-mothers, the legal abortion rate and the abortion funding policy on the motherhood wage penalty, respectively (the variance components for the models are presented in Table A1 in the Appendix A). In the models, the negative coefficients for motherhood show that, net of all other variables, mothers earn less than non-mothers across state-years and states. Additionally, wages are shown to be higher among married women, white women and those who are relatively well educated. Age has a significant curvilinear effect (i.e., a positive age coefficient and a negative age-squared coefficient). Hourly wages peak near the middle of the age distribution and then decline. Additionally, hourly wages increase with full-time work.

At the state-year level, the effect of the percentage of non-mothers on the intercept is positive (model 1), suggesting that women (both mothers and non-mothers) in states with higher percentages of non-mothers earn more than women in states with lower percentages of non-mothers. Similarly, the legal abortion rate (model 2) and public funding for abortions for low-income women (model 3) have a positive effect on the wages of all women.

However, the effects of all three measures on the motherhood slopes are negative and significant. The motherhood wage penalty

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Table 3. Hierarchical Linear Regression Coefficients for Women's Hourly Wage (ln)

	CPS 1988, 1992, 1996, 2000, 2004		
	Model 1	Model 2	Model 3
Individual-Level Effects			
Intercept	–0.2082*	–0.1868†	–0.0954
Black	–0.0372***	–0.0373***	–0.0372***
Other race (non-white)	–0.0133	–0.0133	–0.0137
Age	0.0449***	0.0449***	0.0449***
Age 2	–0.0005***	–0.0005***	–0.0005***
High school	0.1552***	0.1155***	0.1552***
College	0.3588***	0.3588***	0.3588***
Part-time	–0.1332***	–0.1332***	–0.1332***
Married	0.0540***	0.0539***	0.0540***
Mother	–0.1080†	–0.1528**	–0.2220***
Other controls	occupations, working in the public sector		
State-Year-Level Effects			
On the intercept			
Percent professionals	0.7230*	0.7030*	0.8036**
Percent public administration	0.4575	0.4039	0.3566
Percent women professionals	–0.0901	–0.0553	–0.2185
GDP	0.0001***	0.0001***	0.0001***
Labor force participation	0.1906†	0.2992*	0.2320
90–10 ratio	–0.0059	–0.0026	–0.0047
% Margin for the Democrat party	–0.0021***	–0.0021***	–0.0022***
Percent non-mothers	0.0029***		
Abortions per 1,000		0.0018†	
State funding for abortions			0.0474***
On mothers' wages			
Percent professionals	0.7629**	0.7036**	0.5360*
Percent public administration	–0.4946**	–0.3507*	–0.3433†
Percent women professionals	–0.3180†	–0.3407†	–0.1563
GDP	–0.0000*	–0.0000	–0.0000†
Labor force participation	0.1868*	0.1218	0.1670†
90–10 ratio	0.0110	0.0098	0.0132
% Margin for the Democrat party	0.0003	0.0004	0.0003
Percent non-mothers	–0.0026**		
Abortions per 1,000		–0.0012*	
State funding for abortions			–0.0182*
N (individual)	161,666		
N (State Year)	250		
N (State)	50		

Notes: All models control for individual-level occupations and for working in the public sector.

†$p < 0.01$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

tends to be greater in states with a higher percentage of non-mothers (model l), a higher legal abortion rate (model 2) and that provide public funding for abortions for low-income women (model 3). Thus, using 3 different proxies for perceptions of choice, we consistently find that the more that motherhood is conceptualized as a choice, the greater the wage penalties for mothers will be.

The percentage of the labor force in professional occupations positively affects both the wages of all women and the wages of mothers compared to non-mothers (i.e., positive effects on the intercept and on the motherhood slope). The size of the public sector (i.e., the coefficient for the percentage of the labor force in the public

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sector) has a negative effect on the wages of mothers compared to non-mothers (i.e., negative effect on the motherhood slope) and a non-significant, positive effect on the wages of all women. The percentage of women in professional occupations has a non-significant negative effect on the wages of women and on the motherhood slope. GDP positively affects the wages of all women and has a negative effect on the wages of mothers (compared with non-mothers) in one of the models. The participation rate of women in the labor force has a positive effect on both the wages of all women and on the motherhood slope (for each, the effect is not significant in two of the three models). Liberal political attitudes (measured by the % margin vote for the Democrat Party) negatively affect the wages of all women (i.e., negative effect on the intercept) but show a non-significant, positive effect on the motherhood slope. Finally, greater wage inequality among women, as measured by the 90–10 ratio, has a non-significant negative effect on the wages of all women in a given state and a non-significant, positive effect on the wages of mothers.

To rule out the possibility that discrimination against black mothers (especially against unmarried black mothers) created the observed wage penalties, I ran hierarchical linear models using only non-black women at the individual level. Similar significant effects were observed both on the intercept and on the motherhood slope. Because the compositions of economic sectors within states may change over time and because economic sectors vary in their "family friendliness." the effects of the size of all economic sectors were tested but did not change the results reported here (the results are not shown due to space considerations, but are available upon request). Finally, the effect of the gender wage gap (i.e., the relative earning of women to men) was calculated using the IPUMS-CPS dataset and was included in the models. Its effects were not significant in any of the three models (neither on the intercept nor on the motherhood slope) and did not change the results presented here.

One alternative explanation for the results found is that attitudes toward the employment of women influence the explanatory variables (the percentage of non-mothers, the rate of legal abortions and the abortion funding policies) and the motherhood wage penalty. If this were the case, more conservative attitudes toward the employment of women would be expected to decrease the percentage of non-mothers and the legal abortion rate, lead to more conservative abortion policies and *increase* the motherhood wage penalty. However, the analysis reveals that lower abortion rates, lower percentages of non-mothers and more conservative abortion policies are associated with *smaller* wage penalties for mothers.

To summarize, the wage analysis shows that, net of all other variables, the percentage of non-mothers, the legal abortion rate

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and public funding for abortions for low-income women tend to be associated with greater wage penalties for mothers. Thus, the results of this analysis indicate that the more motherhood is conceptualized as a choice, the greater the wage differences between mothers and non-mothers will be. The HLM controls for the effects that the unobserved and unchanging characteristics of states have on women's wages and on the motherhood wage penalty. When determining the relationship between the three independent variables and the motherhood wage penalty, this approach omits alternative explanations that are related to the unchanging traits of states (e.g., geographical differences). Moreover, the state-year level control variables rule out inter-state variations in the structure of the labor force that were shown (in the previous research of cross-national studies) to affect women's wages.

The wage analysis has several limitations. Most notably, it cannot fully distinguish discrimination-based explanations of the motherhood wage penalty from those related to productivity. In addition, the three independent variables may be correlated with other unobserved and changing traits of states that are not measured here (e.g., the selection of mothers into the labor force, women's work experience, the aging of the population). For example, women's productivity and work commitment may be both correlated with perceptions of choice; when motherhood is perceived to be more of a woman's choice, women may pursue their careers instead of raising children. This may affect the selection of women into the groups of mothers and non-mothers and would therefore influence the traits of both groups. Thus, when motherhood is perceived to be woman's choice, non-mothers will be more career oriented than when motherhood is perceived to be less of a choice. The same dynamic applies to non-mothers, in the sense that mothers will be less career-oriented when motherhood is perceived to be a woman's choice. If this statement is accurate, we would expect greater productivity and commitment gaps between non-mothers (who have prioritized their careers over childrearing) and mothers the more that motherhood is perceived to be a woman's choice. This explanation, as well as other alternative explanations that are related to the changing characteristics of states, cannot be totally ruled out in the wage analysis. For these reasons, I supplement the above analysis with a hiring experiment.

The Laboratory Experiment

I use an experimental design in a highly controlled laboratory setting to distinguish between discrimination-based and productivity-based explanations of the motherhood penalty and to

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assess the causality between perceptions of motherhood as a choice and discrimination against mothers. In the experiment, I first prime the participants with ideas about choice or with ideas about constraints; then I ask them to examine the application materials submitted by two equally qualified female job applicants who differ based on their maternal status. Participants are then asked to offer an entry-level salary for both applicants and to recommend only one of them for hiring. Based on my theoretical arguments and on the results of the wage analysis, my main empirical prediction is that participants who are primed with ideas about choice will be more likely to treat mothers negatively compared with participants are primed with ideas about constraints. Note that the productivity and commitment of both applicants were held constant by experimental design.

Overview and Procedure

The sample for the study was a sample of unpaid undergraduate students. Ideally, to test my theoretical predictions, actual employers would participate in a hiring experiment that would examine the relationship between their perceptions of motherhood as a choice and their hiring decisions. Because such a study is not feasible and because a controlled setting is crucial for assessing the relationship between perceptions of choice and discrimination, I use a sample of undergraduate students to supplement the wage analysis (for similar considerations and for the use of a sample of undergraduates in a hiring experiment see Correll, Benard, and Paik 2007).

Participants arrived at the lab individually and were told that they were participating in three studies that were grouped together for efficiency. Each part of the study was given to the participants in a separate booklet with a separate study name and a separate consent form. The first part was a manipulation that primed either ideas of choice or ideas about constraints. Participants were told that they were being put through a reading and comprehension test. The second part was a filler task (a verbal association test). The third part was a hiring experiment.

In this first part of the experiment, participants were primed with ideas about choice or constraints. Participants were provided with an SAT-type reading and comprehension test. The essay presented either a "theory of choice" or a "theory of constraints" (the no-choice condition). The "theory of choice" ("the choice condition") emphasized the increasing number of choices and freedoms people have in modern society and argued that choices play a great role in designing people's lives. The essay referred to specific instances of choices we have in life, including the specific example

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of motherhood. In a similar fashion, the "theory of constraints" essay emphasized the lack of choices people have in life and the enormous constraints they face. It discussed the limitations that social norms, biology, wealth, talent and luck impose on people and the decisions that they make. In addition, the essay provided examples of the limitations and constraints we face in life, including the specific example of motherhood. Both essays described extensive research supporting the respective theory that the participant was being primed with (see Appendices B and C for the two essays). The manipulations were expected to prime the participant with ideas about choice or ideas about constraints and to associate either of these attitudes with motherhood. Participants then answered a short list of questions (under the guise of the "reading comprehension test") that were designed to gauge the degree to which they were primed and assess the extent to which each subject understood the argument and agreed with it.

The second part of the experiment was a filler task designed to separate the manipulation from the hiring experiment and to prevent suspicion about the purpose of the experiment. Participants were given a standard verbal association test in which they were asked to spontaneously make verbal associations to several letters and topics.

In the third part of the experiment, participants were asked to examine the application materials (résumés and cover letters) submitted by two fictitious job applicants for a marketing position in a new high-tech company. The applications were presented originating from real people. Applicants were both female and equally qualified for the position but differed in their maternal status (one applicant was presented to the participants as a mother and the other as a non-mother). The application materials used in the experiment were the same materials used by Correll, Benard, and Paik (2007) in their hiring experiment and were pre-tested to be of equivalent quality. In addition, to verify that differences in the application materials were not biasing the results, the maternal status was counterbalanced across the two applicants. Applicants were both presented as white females to all participants (using white first and last names) to rule out race-related effects.

Following Correll et al., I manipulated the maternal status of the applicants on the résumés. Whereas the mother's résumé listed "Parent-Teacher Association coordinator" under "other relevant activities," the résumé for the childless applicant listed fundraising for her neighborhood association. This method was designed to avoid the implications—related to the applicants' perceived productivity—of having the applicant directly self-identify as a mother on her résumé. The mere presentation of oneself as a mother on a résumé—even if indirectly—might signal a greater commitment to

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care-giving than to working in the labor force. In other words, women who do not try to downplay their motherhood status may be viewed by others as less committed to their careers than other mothers in their position, and they would therefore be viewed as less productive compared to other women. Nonetheless, as I show in the following paragraphs, I found that when the idea of choice was not activated, participants tended to prefer mothers over non-mothers and supported hiring them more often and offering them higher salaries than non-mothers. This finding reduces the likelihood that women who signaled their motherhood status indirectly on their résumés were viewed by the research participants as less committed and less productive than typical mothers. Note also that indirectly indicating a lower social status on a résumé (e.g., gay men or overweight individuals) is commonly used method in the social sciences to document discrimination in the labor force.

After reviewing both applications, participants were asked to report their impressions of the applicants, to recommend a salary for both applicants (ranging from $135,000 to $180,000) and to make and justify a "hiring decision." Finally, before leaving the lab, participants were asked some questions that were designed to check the effectiveness of the experimental manipulation and to address any suspicions that they might have had about the true purpose of the experiment.

The experiment was designed to test the effect of the manipulation in the first part ("a theory of choice" versus "a theory of constraints") of the study on the participant's hiring decision and salary recommendations. Differences in the likelihood of hiring mothers and in salary recommendations, if generated by the exposure to the manipulation, would imply a causal relationship between beliefs about choice and discrimination against mothers.

The effective sample for the study included 40 participants. One participant was suspicious about the study, and his data were therefore excluded from the analysis. A total of 19 participants were randomly assigned to the "choice" manipulation, and 21 were assigned to the "no–choice" manipulation. Male and female participants were randomly assigned to one of the two manipulations. I did not expect the gender of the participant to affect the relationship between the choice manipulation and discrimination against mothers (for the lack of a relationship between the gender of the participant and discrimination against mothers in hiring and salary recommendations, see Correll, Benard, and Paik 2007).[4] Overall,

[4] The effect of the gender of the participants both on the hiring recommendations they made and on the relationship between the manipulation that they were exposed to and the recommendations that they made were later tested. No significant differences were found between female and male participants.

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mothers were hired 45% of the time (18 mothers hired out of 40 hired females). The mean salary recommended by participants was $152,650 (s.d. = $14,618.44).

I evaluated the effectiveness of the experimental manipulation by testing the relationship between the type of manipulation participants were exposed to ("choice" vs. "no-choice") and their answers to the following question: "on a scale of 1 to 100, to what degree do you agree with the statement that 'we always have a choice'?" Whereas the mean answer for participants who were exposed to the "choice" manipulation was 81, the mean answer for participants who were exposed to the "no-choice" manipulation was 59 (t <0.01).

Results

In Table 4, I report the proportions of non-mothers that were hired by the type of manipulation to which the participants were exposed. The results suggest that there is a causal relationship between the perceptions of choice and discrimination against mothers. When exposed to the "theory of choice," participants were more likely to hire equally qualified non-mothers (71%). However, when exposed to the "theory of constraints," participants were less likely to hire non-mothers (37%; $Z < 0.015$ in a test for the difference in proportions between the experimental manipulations). This finding is similar to the findings in the wage analysis, in which the more that motherhood was perceived to be a woman's choice, the greater the wage penalties that were associated with it.

Table 5 presents the differences in salary recommendations for mothers and non-mothers by the type of experimental manipulation. Recall that the participants were asked to recommend an entry-level salary for each applicant (ranging from $135,000 to $180,000). The gap is calculated for each participant. On average, participants who were exposed to the "theory of choice" recommended salaries for mothers that were $6,429 *lower* than their

Table 4. Proportions of Non-mothers Being Hired by Experimental Manipulation

	Proportion of Non-mothers Hired out of all Applicants
"Choice" manipulation	0.714**
"No-choice" manipulation	0.368**

Notes: A mother and a non-mother applied to each job.
**$Z < 0.015$, test for difference in proportions between the "choice" and "no-choice" manipulations.

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Table 5. Differences in Salary Recommendations for Mothers and Non-mothers by Experimental Manipulation

	Gap between the salary recommendations for mothers and non-mothers
"Choice" manipulation	–6,429.000**
"No-choice" manipulation	5,105.000**

Notes: The gap is calculated for each participant (recommendation for a mother—recommendation for a non-mother).
All participants made salary recommendations for both applicants.
**$p < 0.01$, test for difference in means between the "choice" and "no-choice" manipulations.

Table 6. Estimated OLS Regression Coefficients for the Effects of Motherhood and the Experimental Manipulation on Salary Recommendations

	Recommended Salary in Thousands of Dollars
Non-mother	–5.105* (2.409)
Choice Manipulation	1.436 (4.819)
Non-mother*Choice Manipulation	11.534*** (3.674)
Intercept	151.421*** (3.719)

Notes: Robust SEs in parentheses; clustered by participant ID. $N = 80$ applicants.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.001$.

recommendations for non-mothers. However, participants who were exposed to the "theory of constraints" recommended that mothers be paid, on average, $5,105 *more* than non-mothers. The differences between the two groups are statistically significant ($p < 0.01$). These results are consistent with the hiring decisions of the participants as well as with those found in the wage analysis.

In Table 6, I report the estimated coefficients from an OLS regression model used to calculate the effects of childlessness, the degree of experimental manipulation and the effect of the interaction between childlessness and manipulation on the recommended salary. I focus on the individual applicant and analyze the salary recommendations made for 80 job applicants by the 40 participants. Dummy variables are used to indicate whether the applicant was not a mother (non-mother = 1), for whether the participant was exposed to the "theory of choice" manipulation (theory of choice = 1) and for the interaction between the two. Standard errors were clustered by participant to account for the non-independence of observations that resulted from asking each participant to choose between two job applicants.

The main variable of interest is the interaction term that indicates whether priming the subject with ideas about choice increases their salary recommendation for non-mothers (compared to mothers). The main effect for non-mothers is negative, suggesting that when the ideas about choice are not primed, mothers are

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actually advantaged. The interaction between not being a mother and the priming of ideas about choice is significant and positive, indicating that when ideas about choice are primed, non-mothers are offered higher salaries than mothers.

To rule out the possibility that discrimination against non-mothers under the "no choice" condition drives the magnitude of the results (and not discrimination against mothers under the "choice" condition), I supplement the hiring analysis with a proportion test in which the proportion of participants who recommended hiring mothers under the "choice" condition was compared to 50% (and not to the proportion under the "no-choice" condition). The results show that the proportion of participants who hired mothers under the "choice" condition (29%) was significantly lower than 50% ($z < 0.05$). Similarly, I supplemented the salary analysis with a *t*-test in which the average salary difference between mothers and non-mothers under the "choice" condition was compared with an average difference of zero (and not with the average difference under the "no-choice" condition). The results showed that the difference between the salary recommendations for mothers and non-mothers under the "choice" condition (–$6,429) was significantly different than an average difference of zero ($p < 0.015$). This analysis suggests that discrimination against mothers influences the magnitude of the results when ideas about choice are activated.

Both the hiring decisions and the salary recommendations made by participants show that mothers are disadvantaged when beliefs about choice are primed. Given this, how can we distinguish between productivity-based and discrimination-based explanations for the penalties found in the experiment? Recall that the wage analysis could not fully distinguish between discrimination-based and productivity-based explanations of the motherhood wage penalty. In the experiment, however, the qualifications of both applicants were controller for. Although unlikely, the activation of the concept of choice may have affected the perception of productivity, so that when the concept of choice was activated, participants believed that motherhood was a woman's choice and also assumed that mothers were *less* productive than non-mothers. When the concept of choice was not activated, participants assumed that mothers were *more* productive than non-mothers. However, even if this did occur, I would still attribute the disadvantages found in the experiment to either statistical discrimination or status-based discrimination; There were no actual differences in productivity between the two job applicants, only differences in perceptions, and these perceptions were generated by priming the subject with the concept of choice. For these reasons, I conclude that choice-based discrimination led to the disadvantages found in the experiment.

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Discussion

The primary contribution of this research is that it documents the phenomenon of choice-based discrimination against mothers. Whereas a large body of academic research has addressed penalties for mothers in the workforce, the effects of perceptions of choice and responsibility on the hiring and wages of mothers have not been explored. The wage analysis shows that, net of the usual individual and state level factors that affect wages, mothers are penalized more in states where motherhood is perceived to be a woman's choice. The hiring experiment provides strong evidence for a causal relationship between perceptions of choice and discrimination against mothers. By priming participents with ideas about choice or ideas about constraints, I show how mothers are discriminated against more strongly, in terms of hiring and salary recommendations, when understandings of choice are primed.

Although the results of the two studies supported the main hypotheses, the project has several limitations. First, neither study can fully distinguish between explanations that are based on perceptions of choice and explanations that are based on productivity. The proxies in the wage analysis may be correlated with the productivity of women, and, in the second study, the activation of ideas about choice may have activated ideas about productivity. Second, the wage analysis—by its nature—can only report correlations, not causation. For this reason, the wage analysis was supported by an experiment that showed a causal relationship between the activation of ideas about choice and workforce-type decisions. Third, the experiment had two experimental conditions but no control group, meaning that the base hiring rates for mothers were unknown. Note, however, that other studies—including a study in which very similar materials were used (Correll et al.)—found evidence that mothers experienced penalties in hiring and salary recommendations. Finally, the use of undergraduate students in the experiment may have affected the results. Although there is no reason to assume that young adults will be affected more by perceptions of choice, there is no empirical evidence to directly support the generalizability of the results from the experiment. Regardless, the results obtained in the wage analysis suggest that similar trends are found in the labor force and in the behavior of actual employers.

Why is it that when exposed to the "no-choice" manipulation, participants actually preferred hiring mothers over non-mothers and recommended higher salaries? One possible explanation is that participants felt sympathetic toward individuals in undesirable situations that are beyond their control. Another related explanation is that the "no-choice" priming made the injustices of

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discrimination based on maternal status salient (because these traits are not voluntary), causing participants to not only suppress their biases, but to actually prefer the mothers.

The results of this project have several implications for processes affecting the fertility, careers, hiring, and wages of women. First, choice-based discrimination against mothers may lead to a decline in the fertility of women with careers and cause mothers on career tracks to suppress their desire for motherhood. Because mothers are discriminated against in the labor force, women are forced to choose between not becoming mothers and the disadvantages associated with motherhood. It is not surprising then that the more successful a woman is in her career, the less likely she is to become a mother (Goldin 1995). Women with careers who do have children consciously downplay their motherhood in order to avoid discrimination. Some studies show that mothers on career tracks limit their maternity leave to a six-week period. Moreover, they do not display photos of their children at work, downplay childcare responsibilities, and they never admit to leaving work early to care for their children (Hochschild 1997; Yoshino 2006).

Second, conceptualizing motherhood as a choice may have the paradoxical and undesired effect of reducing the state's commitment to gender equality. In recent years, the wage differences between mothers and men have accounted for an increasing majority of the gender wage gap, Mothers are thus disadvantaged in the workforce compared to both men and non-mothers (Glass 2004). Because women are increasingly perceived as having the freedom to abstain from motherhood (and therefore not be discriminated against), discrimination against mothers may be justified by the belief that motherhood is a choice, and a choice that the state is no longer obligated to resolve (Williams 1991). Note that labor force discrimination against mothers is a new form of gender discrimination that reflects the changes in the cultural norms surrounding childlessness and motherhood; it resembles other features of gender inequality (such as the segregation of occupations and the division of household labor) that persist—sometimes in new forms—even in times of social, technological, and economic change (Ridgeway 2011; Risman 2004).

Finally, the results of this project have implications for our understanding of discrimination that go beyond gender inequality. Additional traits such as sexual orientation and obesity are also perceived by many to be controllable, and they evoke negative emotions and moral judgment. Based on the results of this project, I expect labor force discrimination against gay men and obese individuals to be greater when weight and sexual orientation are perceived to be controllable.

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Appendix A

Variance Components

Table A1. Variance Parameters Associated with HLM Models

	Model 1		
	Variance	d.f.	χ^2
Level 1	0.3405		
Level 2			
Intercept	0.0004	192	300.4700***
Mother Slope	0.0003	241	278.0361
Level 3			
Intercept	0.0082	49	1,859.8668***
	Model 2		
	Variance	d.f.	χ^2
Level 1	0.3405		
Level 2			
Intercept	0.0004	192	310.9053***
Mother Slope	0.0003	241	280.4815*
Level 3			
Intercept	0.0076	49	1,688.2932***
	Model 3		
	Variance	d.f.	χ^2
Level 1	0.3405		
Level 2			
Intercept	0.0004	192	296.5350***
Mother Slope	0.0003	241	281.4481*
Level 3			
Intercept	0.0079	49	1,802.6104***

Notes: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Appendix B

Reading Comprehension Test

This study is designed to test your ability to understand a passage and answer questions on the basis of what is stated and implied in the passage. The reading passage is accompanied by a set of questions based on the passage. Answer the questions according to what is stated or implied in the passage. You need to read the passage first so that you can identify the main idea of the passage and appreciate features such as the author's tone and attitude as well as the organization of the passage.

Choice is a catchword in our liberal, individualistic society, but it is rarely a practical reality. Regardless of how much decision-making power people think they have, in many situations, the choices people have are very limited. People are not "free" agents unconstrained by their contexts, by biological predispositions, by resources and by culture. Even the everyday, simple choices we think we make, such as what to wear or eat, are constrained, let

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alone the life-defining choices such as who to marry and how many children to have.

Clearly everyone has at least some choice in life, but our choices are constrained by both biological predisposition and a wide range of other environmental factors; People do not choose their race, their sex, and other biologically determined characteristics that tremendously affect the possibilities and opportunities they have. Think of the people who try to adopt healthy lifestyle habits to overcome biological predispositions for obesity. Undoubtedly they have a certain degree of control over their illnesses—they can adopt a healthy life style in the hope of affecting the progress of their diseases, but at the end of day, their ability to fight the biological predisposition is extremely limited. In fact, research suggests that Obesity is most commonly caused by a genetic susceptibility, endocrine disorders, medications or psychiatric illness that are not controllable. A commonly quoted genetic explanation for the rapid rise in Obesity is the mismatch between today's environment and "energy-thrifty genes" that multiplied in the past under rather different environmental conditions. In other words, according to the "thrifty genotype" hypothesis, the same genes that helped our ancestors survive occasional famines are now being challenged by environments in which food is plentiful year round.

Another example is the example of sexual orientation. Although homosexuality is considered by many to be a choice of a lifestyle rather than biologically based, sexual orientation has proved to be generally impervious to interventions intended to change it. The American Academy of Pediatrics states that: "The current literature and most scholars in the field state that one's sexual orientation is not a choice; that is, individuals do not choose to be homosexual or heterosexual." For these reasons, all national mental health organizations have adopted policy statements cautioning the profession and the public about treatments that purport to change sexual orientation.

Like biological predispositions, cultural expectations constrain people's choices. Culture defines what is important to us in life—our goals and priorities. When we think of where we want to live or work, or about the family we want to have—our beliefs and ideals are affected, to a large degree, by the culture surrounding us—what other people around us do, the movies we watch, the books we read and the stories we hear. Think for example about the cultural pressures for women to marry and have children; the roles of women and of feminine identity have been historicallyand traditionally constructed around motherhood. Women are thought to believe that being a mother is both desirable and fulfilling, so that not becoming a mother becomes almost an unacceptable option.

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The point is that, as much power we think we have in making choices, in the long run our free will is always limited.

Some people believe that there is always a choice. But in reality, the situations that change our lives positively or negatively, and determine who and what we will become, are greatly affected by factors that are beyond our control.

Questions (please provide short answers, no longer than 4 sentences):

What is the main argument made by the author?
What is the purpose of the second paragraph?
How do contexts affect people's choices?

The author claims that some people (mistakenly) believe that there is always a choice. To what degree do you agree with the statement that "we always have a choice" (1–100)?

Appendix C

Reading Comprehension Test

This study is designed to test your ability to understand a passage and answer questions on the basis of what is stated and implied in the passage. The reading passage is accompanied by a set of questions based on the passage. Answer the questions according to what is stated or implied in the passage. You need to read the passage first so that you can identify the main idea of the passage and appreciate features such as the author's tone and attitude as well as the organization of the passage.

> As human beings, we are endowed with freedom of choice, and we cannot shuffle off our responsibility upon the shoulders of God or nature. We must shoulder it ourselves. It is up to us.
>
> A J Toynbee

Choice is important to each of us in our daily lives. The choices we make help to define the type of lives we lead. This includes everyday simple choices such as what to wear or eat, as well as life-defining choices such as where to live and work, who to marry and how many children to have.

Some argue that people are so limited by their biological predisposition and a wide range of other environmental factors, that free choice is not an option. But there is always a choice. Think of the people who choose to adopt healthy lifestyle habits—exercise more and keep a healthy balanced diet—to overcome a biological predisposition for Obesity. In fact, Obesity is the leading *preventable* cause of death worldwide. Research suggests that only a few cases are caused solely by genes, endocrine disorders, medications, or

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psychiatric illness. The primary treatment for obesity is dieting and physical exercise. To supplement this, or in case of failure, anti-obesity drugs may be taken to reduce appetite or inhibit fat absorption. In severe cases, surgery is performed or an intragastric balloon is placed to reduce stomach volume and/or bowel length, leading to earlier satiation and reduced ability to absorb nutrients from food.

Or think of sexual orientation. Most scientific organizations believe that although biology plays some role, genetics alone cannot cause sexual orientation. Scientists have studied identical and fraternal twins to learn if being gay is biologically determined. The results suggest that there is only a *partial* genetic influence on sexual orientation. If being gay were strictly genetic, then in identical twins, there would be a 100% concordance rate for sexual orientation. This is not at all the case. The studies reveal that people with the same genetic make up (identical twins) are only to some extent more likely to share sexual orientation than those with different genetic make up (fraternal twins). Therefore, although genetics do play a role in affecting one's sexual orientation, it cannot cause sexual orientation. The point is that, whatever limits we have to free will, in the long run it is our choices that determine the ultimate direction of our life.

Like biological predispositions, social and cultural norms and beliefs affect our behaviors, but this does not mean that we cannot control our lives and make choices. It is true for example, that women are taught to believe that being a mother is both desirable and fulfilling. Recent years, however, have seen a growing trend among women to choose to remain childless despite the cultural/social pressures. In the United Kingdom, it is estimated that as many as 25 percent of women born in 1973, will not have children. Similar estimates apply to the U.S.

The critical choices are those that change our lives, positively or negatively, and are major factors in determining who and what we will become. Such choices require us to define our goals and priorities in life—and choose what is really important to us. Whether it is about the family unit we want to have, the career we aspire to or the lifestyle we want to adopt: we always have a choice.

Questions (please provide short answers, no longer than 4 sentences):

What is the main argument made by the author?
What are the purposes of the examples of "who to marry and how many children to have" in the first paragraph?
What is the purpose of the second paragraph?
To what degree (1–100) do you agree with the author's statement that "we always have a choice"?

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