

Before and After: Gender Transitions, Human Capital, and Workplace Experiences

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Abstract

We use the workplace experiences of transsexuals – individuals who change their gender typically with hormone therapy and surgery – to provide new insights into the long-standing question of what role gender plays in shaping workplace outcomes. Using an original survey of a sample of male-to-female and female-to-male transsexuals, we document their earnings and employment experiences of transsexuals before and after their gender transitions. We find that while transsexuals have the same human capital after their transitions, their workplace experiences often change radically. For many male-to-female transsexuals, becoming a woman brings a loss of authority and pay, and often harassment and termination. On the other hand, for many female-to-male transsexuals, becoming a man brings increases in workplace respect, authority, and, in some cases, earnings. These findings challenge the omitted variables explanations for the gender pay gap and illustrate the often hidden and subtle processes that produce gender inequality in workplace outcomes.

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1) Introduction

When economics professor Donald McCloskey announced to the chair of his department that he was transitioning to become a woman, the Chair joked that Donald – now Deirdre – could expect a pay cut (McCloskey 1999). While the Chair’s comment was in jest, it speaks to a larger and long-standing question of what role gender plays in workplace outcomes. Social scientists have long documented the relationship between an employee’s gender and their opportunities for advancement in both pay and authority. While the gender gap in earnings has narrowed for men and women in comparable occupations, men continue to outpace women in salaries, promotions, and workplace authority (Valian 1999; Padavic and Reskin 2002, Blau and Kahn 2006). Yet, as existing surveys can neither measure gender bias directly nor measure all the relevant characteristics of men and women, the source of these workplace disparities remains unknown.

As McCloskey’s story illustrates, the workplace experiences of transsexuals – individuals who transition from one recognized gender category to another via hormones and often surgery – offer an innovative way to explore the importance of gender in the workplace. Transsexuals are a small population estimated to make up only .01% of the United States population, with equal numbers of male-to-females (MTFs) and female-to-males (FTMs) transsexuals (Brown and Roundsley 1994; Meyerowitz 2002).¹

¹ Transsexuals are individuals who live full-time in a gender other than that they were assigned at birth. Typically transsexuals transition using hormone therapy and surgeries. Transsexuals are distinct from “cross-dressers,” individuals who dress in the clothing of the opposite sex periodically but do not plan to live full-time in another gender.

Transsexuals' experiences working both as men and as women can be framed as a kind of experiment that illuminates the subtle ways that gender differences and gender inequality are socially produced in the workplace. While transsexuals have the same human capital and pre-labor market gender socialization after their gender transitions, their workplace experiences often change radically. Existing autobiographical and scholarly research demonstrates that for many MTFs, becoming women brings a loss of authority and pay, as well as workplace harassment and, in many cases, termination (e.g. Bolin 1988; Griggs 1998; McCloskey 1999; Schilt 2006a). On the other hand, for many FTMs, becoming men can bring an increase in workplace authority, reward, and respect, as well as new job opportunities and promotions (e.g. Griggs 1998; Schilt 2006a, 2006b). Transsexuals' *before* and *after* workplace experiences, then, can help make the hidden processes that produce workplace gender inequality visible.

In this paper, we use the pre- and post-gender change workplace experiences of MTF and FTM transsexuals to examine the persistence of gendered workplace disparities that advantage men and disadvantage women. Drawing on survey data about transsexual employment experiences before and after gender changes, we demonstrate that these gender transitions bring important changes in workplace outcomes. In becoming women, MTFs experience significant losses in hourly earnings from becoming female. In contrast, FTMs experience no change in earnings or small positive increases in earnings from becoming men. Additionally, we find that MTFs transition to become women on average 10 years later than FTMs transition to become men. We interpret this as evidence that the male gender, net of all measured and unmeasured individual characteristics, has a labor market benefit which MTF transsexuals delay giving up.

These findings suggest that regardless of childhood gender socialization and prior human capital accumulation, becoming women for MTFs creates a workplace penalty that FTMs do not generally encounter when they become men. And, while MTFs may benefit from being men at work before their gender change, they cannot take this male gender advantage with them into womanhood. We view these findings as evidence that the gender gap in workplace outcomes does not entirely reflect omitted variables, such as unobserved human capital, but instead suggests that the labor market is not gender neutral.

Theories of Workplace Gender Inequality

A fundamental question in the social sciences is why women continue to lag behind men in salary, promotion, and authority. Although prior research attributes much of the gender wage gap to measurable differences in education, occupations, and labor force attachment, these factors still do not entirely explain all of the gender gap in earnings (Goldin 1990; Paglin and Rufolo 1990; Fuller and Schoenberger 1991; Groshen 1991; Wood, Corcoran and Courant 1993; Brown and Corcoran 1997; Altonji and Blank 1999; Blau and Kahn 2006). Although white-collar men and women with equal qualifications can begin their careers in similar positions in the workplace, men tend to advance faster, creating a gendered promotion gap (Valian 1999; Padavic and Reskin 2002). Even in female-dominated professions, such as nursing and teaching, men outpace women in advancement to positions of authority (Williams 1995). Similar patterns exist among blue-collar professions, as women are often denied sufficient training for advancement in manual trades, passed over for promotion, or subjected to sexual harassment (Miller 1997; Yoder and Aniakudo 1997; Byrd 1999).

There are several conflicting theories to explain these remaining gender gaps.² One set of theories, which we call the “omitted variables” theories, explains the observed differences as due to differences in the types of unobserved human capital accumulated by men and women or differences in preferences for certain types of occupations and work settings. To the extent these differences are not measured in our data, we cannot control for these factors and the currently estimated gender gaps in earnings suffer from omitted variable bias. An alternative set of theories, which we call the “discrimination theories,” posits that the gender gap exists due to various forms of gender discrimination on the part of employers. These theories argue that women and men with the same levels of human capital and in equivalent jobs or occupations experience different labor market outcomes due to employer discrimination.

Omitted Variable Theories

The first set of theories argues that observed differences in workplace outcomes are due to earlier gender differences in human capital accumulation and socialization. As women workers are more likely to take time off from work for childrearing and family obligations, on average they obtain less education and work experience than men. This body of theory argues that observed differences in labor market outcomes by gender therefore stem at least partly from these disparities in skills and experience. In addition, the observed gender gap in earnings may also be due to gender differences in socialization from family, peers, schools, and the media which help instruct individuals about what behaviors are appropriate for their gender (Kimmel 2000; Marini 1989; Subich et al. 1989). This body of theory argues that the gendered socialization process causes women to form preferences for jobs that reinforce feminine traits such as caring and nurturing, and can

² Blau, Brinton, and Grusky (2006) provide a recent review of some of the major theories.

account for the predominance of women in “helping” professions such as nursing and teaching. As women are socialized to put family obligations first, female workers prefer jobs that allow more flexibility for family schedules, and accept lower earnings and opportunities for advancement. Women may also avoid higher paying blue-collar jobs, as they view these types of occupations as unsuited for women (Paap 2005). Men, on the other hand, are socialized to seek higher paying jobs that carry more authority to reinforce their sense of masculinity (Gould 1974; Kimmel 2000).³

Discrimination Theories

An alternative set of theories points to employer discrimination as the cause of the observed gender differences in workplace outcomes. Taste discrimination, originally formulated in the context of racial discrimination (Becker 1971), posits that employers have explicit preferences for hiring workers that have characteristics with no relation to worker productivity. Employers may engage in what has been termed “homosocial reproduction,” hiring workers who reflect their own identities and characteristics (Bird 1996). As white men are more likely to be in control of the hiring process, this means a preference for other white men (Bird 1996; Padavic and Reskin 2002; Williams 1995). Another more widely cited form of discrimination, statistical discrimination, occurs when employers base hiring, promotion, and compensation on worker stereotypes because of incomplete information about worker productivity (Phelps 1972; Arrow 1973; Bowlus and Eckstein 2002; Moro and Norman 2004).

An extensive empirical literature documents that gender discrimination and segregation in occupations and work tasks occurs even within specific work settings as

³ As Corcoran and Courant (1985) argue, pre-labor market socialization can affect human capital accumulation of men and women before they enter the labor market and their preferences or tastes for certain kinds of jobs.

employers have preconceptions as to what types of characteristics the workers who fill the jobs should carry (Acker 1990; Williams 1995; Padavic and Reskin 2002; Martin 2003; Moss and Tilly 2001). “Female” characteristics, such as caring and sympathy, are typically preferred for jobs that involve a large amount of customer service interaction (Hochschild 1983). “Male” characteristics, such as rationality and competitiveness, are typically preferred for managerial positions (Kanter 1977; Acker 1990), even within female-dominated professions (Williams 1995). For example, Robin Leidner’s (1993) study of McDonalds revealed that female employees are pushed into cashier positions, as women are seen as better suited to customer relations. Male employees, on the other hand, are given the more “technologically complex” job of operating the grill. These same general patterns of gender segregation in work tasks are also found in high paying professions, such as in the legal profession (Wood et al 1993; Valian 1999). This attribution of gender to jobs reproduces sex segregation so that, within the same work settings, women tend to be clustered with other women in lower paying jobs, while men are clustered at the top with greater pay, authority, and autonomy (Padavic and Reskin 2002).

While these gendered stereotypes manifesting in various forms of discrimination have important repercussions for men and women’s labor market outcomes, it is difficult to quantify their importance for several reasons. First, while men and women with similar measured education and workplace experiences can be compared in a multivariate analysis, differences in outcomes can be attributed to unmeasured characteristics of the worker rather than to systematic gender bias. Second, gendered expectations about what types of jobs women and men are suited for are strengthened by existing occupational segregation. The fact that there are relatively more women nurses and more men doctors comes to be seen as

proof that women are better suited for “helping” professions and men for “rational” professions. The normalization of these disparities as natural differences obscures the actual operation of men’s advantages and therefore makes it difficult to document them empirically. Finally, men’s advantages in the workplace are not a function of simply one process but rather a complex interplay between many factors, such as human capital differences, differences in employers’ expectations about skills and abilities by gender, and differences between men and women in family and childcare obligations. It may be difficult to understand the interplay of these many factors by an examination of existing observed workplace outcomes.

Using Transsexuals to Study Gender

In this paper we propose a unique test of the role of gender in the workplace. Consider an idealized experiment in which a randomly chosen treatment group of adults wakes up and has unexpectedly undergone a gender change over night. Omitted variable theories predict that there should be no change in labor market outcomes, as the skills and background of the workers remains the same. Discrimination theories, on the other hand, would predict that these workers would experience a reversal in labor market outcomes. To test these theories, we use the workplace experiences of transsexual workers as an approximation to this idealized experiment.

This empirical approach has two main precursors. First, an extensive literature uses identical twins to study socio-economic phenomenon. In the economics literature, the main focus of this research has been on estimating the returns to schooling using samples of twins (e.g. Ashenfelter and Krueger 1994, Behrman, Rosenzweig, and Taubman 1994). The research rationale for using identical twins is that twins share the

same genetic and often the same family background. The twins form a two person panel that can be used to study the effects of schooling as long as the schooling choices of one twin differs from the other twin. Like research on twins, our approach also forms panels, but instead of using one identical twin matched with his or her sibling, we construct a panel using the individual's work experiences in two different periods, before and after their gender change. This strategy avoids the major problem with research using twins that the observed difference in twin behavior (e.g. one attends college and the other does not) may be endogenous (Bound and Solon 1999).

The main disadvantage to our research design relative to twins research is the question of whether the employment experiences of the transsexual population are representative of the rest of the population. While a twin birth is randomly occurring, it is still to be determined if the desire to change one's gender is also a random occurrence. Psychological literature on transsexualism locates the desire to undergo a gender transition in early childhood gender dynamics, but does not offer any insight into the prevalence of this type of occurrence. More recent research suggests a biological basis to transsexualism, either located in the brain or in the genetics, although whether this occurrence is random or not is not yet known.⁴ The financial means to carry out a gender change are not random, however, meaning not all individuals who seek to undergo a gender transition are able to realize this goal. Yet, while individuals may not be able to access surgeries – the most expensive part of the transition process – they often are able to find, particularly in urban areas, free services or black market services that provide access to hormone therapy. With hormone therapy and clothing changes, many

⁴ See Devor (1997) for an overview of psychological theories on transsexualism. See Rudacille (2004) for an overview of biological theories on transsexualism.

transgender individuals are able to transform their appearance and begin working in a gender other than that which they were assigned at birth (Griggs 1998). Below we directly address this question of external validity using a comparison sample drawn from the entire population.

Another precursor for our research methodology comes from the sociological literature of "breaching experiments" pioneered by Harold Garfinkel (1967). Developing his ethnomethodological framework in the 1950s, Garfinkel sought to demonstrate how social actors produce and maintain a shared sense of reality about the everyday world. To get to the social production of this type of taken-for-granted knowledge, Garfinkel created experiments designed to "breach" reality. In one set of experiments, he sent students out to grocery stores with instructions to barter with the clerks about the price of canned goods. In another series, his students boarded buses and then proceeded to argue with the bus driver about the final destination of the bus line. In his most famous case, Garfinkel drew on a set of interviews with a young MTF, "Agnes," to outline how naturalized attitudes about gender are produced. With all of these cases, Garfinkel's experiments breach taken-for-granted assumptions about shared reality. Watching the reactions to these experiments – angry bus drivers, confused clerks, transsexuals learning how to be new men or new women – Garfinkel demonstrates the intentional work that goes into producing typical, everyday interactions and assumptions. Extending Garfinkel's work to the realm of the workplace, we show how a proxy breaching experiment, the pre- and post- gender change experiences of transsexuals, can help make visible the subtle ways stereotypes about men and women impact workplace outcomes.

The remainder of this paper is organized as follows. The next section describes the survey design and our original data collection. We then discuss the econometric specifications and results. The final sections discuss the results and puts the quantitative findings in a fuller context using related qualitative research.

2) Data Collection

Survey Design and Administration

This article draws on survey data collected in 2004-2005 by the authors from a sample of transsexual workers. To allow for comparability between the data on the general population and this transsexual population, survey questions were modeled after the 2002 Current Population Survey (CPS). Our transsexual survey was constructed as a three period panel. The survey asked respondents to provide hours, occupation, industry, and earnings information for jobs held at three distinct points in their lives: the last job held before they underwent any procedures to change their gender, the first job held after their gender change, and their most recent job. Respondents were asked to self-report a date for each of these time periods (e.g. the last day worked before their gender change), and retrospectively report their employment and earnings information as of that date. For most respondents, there was little (less than 1 year) or no gap between their report for the immediately after and most recent job. Because there is less non-response for the questions corresponding to the job held immediately *after* their gender change, we use this information to contrast to the period *before* the gender change.

For each period, respondents were asked to report how much they “usually earn” at their “main job.” We construct an hourly earnings variable based on reported earnings

and the number of weeks and hours the respondent reported that he or she usually worked on this main job. Because earnings were reported for several different calendar periods, the hourly earnings are adjusted for inflation using the Consumer Price Index (CPI-U series). All earnings in the paper are reported in 2004 dollars.

The transsexual survey supplemented the earnings and employment questions with a battery of questions specific to the transsexual population. Respondents were asked about their decisions regarding the use of surgical and hormonal treatments to change their gender, their beliefs about how well they passed in their new gender, and how much face-to-face contact they had with co-workers and customers.

Collecting a random sample of transsexuals is not possible, as the population is small and cannot be contacted directly through traditional means (mailings, telephone calls, etc.). Instead, the survey was administered in person at transsexual conferences and through a website advertisement. The survey was handed out to voluntary participants at three transsexual conferences: Transunity in Los Angeles, California in June 2004, A Gender Odyssey in Seattle, Washington in September 2004, and the International Foundation for Gender Expression in Austin, Texas in April 2005. Most of the respondents completed the survey on site, but a few mailed the survey to the authors later. In addition, the survey was posted online at the website *transacademics.org*, and readers were asked to email or mail completed surveys to the authors.

Transsexual Sample

Of the 64 returned surveys, 54 were from respondents who attend one of the three conferences. The remaining surveys were obtained by email or mail from non-conference attendees. Because the analysis is concerned with changes in workplace

experiences *after* the gender change, the sample used in the analysis excludes respondents who did not report earnings *before* their gender change. This excludes all individuals who never held a job before their gender change. But the sample does include individuals who were employed before their gender change but were unemployed at the time of their gender change. Also dropped from the analysis sample are respondents who reported working before their gender change but did not report their occupation, industry, or usual hours for this job. Respondents with non-reported education, age, and race were also excluded from the sample.

After excluding the non-respondents, the final sample consists of 43 respondents: 18 MTF transsexuals and 25 FTM transsexuals. The original MTF and FTM composition among all of the 64 returned surveys was similar (27 MTF and 37 FTM). The higher proportion of FTM transsexuals is due to the selective nature of conferences we were allowed access. The Gender Odyssey conference at which 25 surveys were completed is almost exclusively a conference for FTM transsexuals. We examine the demographics of the transsexual sample in the Results Section and compare them to those for the general population of adult workers.

Comparison Sample

Because the respondents we were able to contact are associated with transsexual organizations and conferences, the sample is skewed toward activists and individuals who are more open with their transsexual identity. However, we are not directly interested in how representative our transsexual sample is of all transsexuals, but how this sample compares to the general population. Therefore, we constructed a comparison sample from the CPS to examine the representativeness of the transsexual sample on the basis of their

characteristics before their gender change. Given that respondents were asked to report earnings and employment information for any period before their gender change, our transsexual survey is not completely consistent with any one CPS survey, since each monthly survey asks about recent employment and earnings. However for simplicity we choose to construct one comparison sample from the 2003 March Annual Demographic CPS supplement. The comparison CPS sample is broad and includes all adults age 18 or older who report working at least 1 hour the past year for pay. The sample sizes are 52,420 men and 42,259 women.

The demographic, education, occupation, and industry questions in this survey are nearly identical to those in our transsexual survey. The earnings question in the 2003 March CPS is somewhat different however. In the March CPS, respondents are asked to report their total labor market earnings for the past year, rather than usual earnings on the last job as in the transsexual survey. For the March CPS data, we construct as closely as possible an equivalent measure of hourly earnings using reported hours worked during the year and usual hours worked per week. Since the comparison CPS sample is from 2003 whereas the retrospective earnings and employment information is for several periods, earnings for the CPS comparison sample are adjusted for inflation and expressed in 2004 dollars as with the transsexual sample.

3) Econometric Specifications

This section explains how our transsexual data can be used to examine the long-standing issue of gender differences in earnings. Below, we interpret the earnings results in more detail and examine these results in the context of other employment outcomes.

The current methodology uses observed characteristics to control for differences in men's

and women's backgrounds. Most studies posit a relationship between earnings and observable individual characteristics, such as measures of education and work experience. Male and female earnings (W_{im} and W_{if} , respectively) can be written as

$$W_{im} = X_{im}'\beta_m + Z_{im}'\delta_m + \varepsilon_{im} \quad (1)$$

$$W_{if} = X_{if}'\beta_f + Z_{if}'\delta_f + \varepsilon_{if} \quad (2)$$

i indexes individuals, m indexes males, f indexes females. X_{im} and X_{if} are vectors of *observed* characteristics of men and women, respectively, Z_{im} and Z_{if} are vectors of *unobserved* characteristics, and ε_{im} and ε_{if} represents error. The typical decomposition of earnings examines the difference in male and female earnings given by

$$W_{im} - W_{if} = (X_{im} - X_{if})'\beta_m + (Z_{im} - Z_{if})'\delta_m + \eta_i \quad (3)$$

$(X_{im} - X_{if})'\beta_m$ represents the portion of the difference in earnings that is explained by differences in male and female observed characteristics. $(Z_{im} - Z_{if})'\delta_m$ represents the portion of the earnings differences that is due to gender differences in unobserved characteristics.⁵ Omitted variables theories predict that if we can measure all relevant observed *and* unobserved human capital and socialization characteristics of men and women, the gender gap in earnings would be negligible (η_i would be small). However, because of the presence of the unobservable characteristics Z_{im} and Z_{if} , researchers cannot directly test these hypotheses by using differences in earnings between men and women to estimate η_i . That is, the estimated “residual” earnings difference, after controlling for all differences in observable characteristics ($X_{im} - X_{if}$), is a combination of unobserved differences ($Z_{im} - Z_{if}$) and the true residual difference η_i . This problem is

⁵ As is common in the decomposition literature, we are valuing the difference in male and female attributes at the male parameters β_m and δ_m . For the purposes of this paper, this is not an important aspect of the analysis.

equivalent to the failure of OLS estimation because of the presence of unobservable variables that are correlated with earnings and gender.

This paper uses the information on earnings for transsexuals before and after their gender change to net out both observed and unobserved differences. For an FTM transsexual, the earnings after their gender change (when they are male) minus the earnings before their gender change (when they are female) can be written as

$$\begin{aligned} W_{im}(\text{after}) - W_{if}(\text{before}) &= [X_{im}(\text{after}) - X_{if}(\text{before})]' \beta_m \\ &+ [Z_{im}(\text{after}) - Z_{if}(\text{before})]' \delta_m + \eta_i(\text{FTM}) \end{aligned} \quad (4)$$

Similarly, we can write the before and after difference in earnings for an MTF transsexual as

$$\begin{aligned} W_{if}(\text{after}) - W_{im}(\text{before}) &= [X_{if}(\text{after}) - X_{im}(\text{before})]' \beta_m \\ &+ [Z_{if}(\text{after}) - Z_{im}(\text{before})]' \delta_m + \eta_i(\text{MTF}) \end{aligned} \quad (5)$$

Unlike in the OLS case, the true residual difference in earnings, net of observable and unobservable characteristics, $\eta_i(\text{FTM})$ and $\eta_i(\text{MTF})$, can be identified if the *before* and *after* characteristics are the same for MTF and FTM transsexuals:

$$X_{im}(\text{after}) = X_{if}(\text{before}) \text{ and } Z_{im}(\text{after}) = Z_{if}(\text{before})$$

$$X_{if}(\text{after}) = X_{im}(\text{before}) \text{ and } Z_{if}(\text{after}) = Z_{im}(\text{before})$$

The basis of this assumption is that a transsexual worker carries through to their new gender all of their observed and unobserved characteristics. The key difference between this methodology and the previous literature is that with our unique panel data we can net out the unobserved differences along with observed differences. If this assumption holds, then the earnings differences in Equations (4) and (5) identify the true residual differences. In addition, because we have two independent estimates of the difference in

earnings, one for MTFs and one for FTMs, we can test whether the earnings differences have the correct predicted sign. We would predict that, even after controlling for observed and unobserved, FTM transsexuals would experience a gain in earnings ($\eta_i(\text{FTM}) > 0$), and MTF transsexuals would experience a loss in earnings ($\eta_i(\text{MTF}) < 0$).

4) Results

Comparison Between Transsexual Sample and General Population

One of the important limitations of using data on transsexuals to study general patterns of gender in the workplace is that the transsexual population before their gender change may not be representative of the general population. As transsexuals are a relatively hidden population, there is no demographic data that would allow for a definitive resolution of this point. However, our survey data reveals that the transsexuals in our sample do not exhibit significantly deviant workplace participation patterns prior to their gender change. In our sample, the transsexuals worked on average 5.8 years for their last employer prior to their gender change. In addition, 53.5 percent of the transsexuals remained with the same employer following their gender change.

Moving beyond pre-gender change workforce participation, we examine more systematically the representativeness of the transsexual sample by comparing the pre-gender change characteristics of MTFs and FTMs with all males and females from the comparison CPS sample. Examining Table 1, two important differences between the CPS sample and the transsexual sample before the gender change stand out. First, while MTFs are on average about the same age as the general male population, FTMs are on average about 10 years younger than the general female population and 10 years younger

on average than MTFs. As discussed below, we interpret this as evidence that MTFs may be attempting to preserve their male advantage at work for as long as possible, whereas FTMs may be seeking to quickly shed their disadvantaged female gender identity. A second important difference is that both MTFs and FTMs are twice as likely to have a college degree as the general population. This likely reflects the fact that the sample was collected from transsexual conference attendees who tend to have higher levels of education. To address both these issues, we control for difference in education levels and age in the multivariate analysis.

Although there are age and education differences between the transsexual and general populations, Table 1 shows that the two populations are comparable on several dimensions. Both populations are between 70-80 percent white. The composition of types of employment (private, government, and self-employment) for MTFs before their gender change is similar to that of all men. Reflecting the higher level of education among the MTF sample, more MTFs are employed in white collar occupations than the general male population. There is also a higher proportion of FTMs employed in the government sector prior to their gender change than the general female population. While these differences are not trivial, the transsexual sample before their gender change does not exhibit a radically different employment and occupational composition from the general population.

As a further test of the representativeness of the transsexual sample before their gender change, Table 2 compares mean hourly earnings for the transsexual sample before their gender with earnings for the general population. Due to the differences in education, we compare earnings conditional on education. To address the difference in

the distribution of ages in the transsexual sample relative to the general population, we calculate hourly earnings using the distribution of ages in the CPS data to weight the transsexual sample to be representative of the general population. The first row provides the non-weighted mean hourly earnings for each of the four sub-samples: all males (CPS comparison sample), MTFs (before their gender change), all females (CPS comparison sample), and FTMs (before their gender change). The college educated MTFs earn on average \$31.88 per hour before their gender change, compared to \$35.67 for all college educated males. College educated FTMs earned \$22.38 per hour compared to \$24.33 for all college educated females. Non-college educated MTFs earn on average \$21.87 before gender change compared to \$18.47 for all non-college educated males. For non-college educated FTMs, mean hourly wages are \$12.59 compared to \$13.89 for all non-college educated females. Comparing the first and second rows indicates that mean hourly earnings change only slightly using the age-weighted sample.

In all of these comparisons, we cannot reject the hypothesis at the 5 percent confidence level that mean hourly wages for transsexuals before their gender change are equal to those for the general population.⁶ Transsexuals before their gender change are employed in jobs with wages that were statistically indistinguishable from those of the general population. The relatively small differences in earnings between transsexuals before their gender change and the general population is consistent with the notion that transsexual employment patterns are not substantially different from the non-transsexual population. However, we should be careful in interpreting this finding due to the small

⁶ The t-tests for the paired difference in means between All Males and MTF and All Females and FTM are available on request from the authors. For all of these t-tests, the p-value is smaller than 0.05.

size of the transsexual sample and the consequently much higher standard errors for statistics calculated from this sample than from the CPS sample.

Timing of Transition

One of the more salient patterns evident in the transsexual sample is the stark difference in the timing of the gender change for MTFs and FTMs. As reported in Table 1, male-to-female transsexuals transition on average 9.6 years after female-to-male transsexuals. The MTFs on average choose to remain in their male gender until age 40, whereas FTMs on average change their gender at age 30. This later age at gender change is consistent with the hypothesis that MTFs change their gender later to preserve their male advantage as long as possible. We argue that this difference in behavior between MTFs and FTMs suggests that transsexuals anticipate that their pre-gender change human capital will not receive the same value after they change their gender. MTFs react to the loss they expect to receive from becoming women by minimizing these losses through delaying their gender change. FTMs, on the other hand, maximize their expected gains from becoming men by changing their gender earlier.

Table 3 explores whether this difference in age at transition is robust to the inclusion of control variables. The dependent variable for the regression models in Table 3 is the age at which the transsexual respondent was last employed before beginning their gender change. The regression models are estimated on the pooled FTM and MTF samples. Model 1 includes an intercept and a dummy variable for the FTM respondents. The estimated intercept replicates the MTF average age at gender change reported in Table 1. The estimated coefficient on the FTM dummy variable for Model 1 is -9.60 ,

indicating that FTMs transition 9.6 years earlier than MTFs. This coefficient estimate is statistically significant at the 1 percent level.

Models 2-4 in Table 3 add various covariates to the regression model as controls for education, demographics, and pre-gender change employment. Looking across the regression models in Table 3, the estimated coefficient on the FTM dummy variable remains statistically significant at the 5 percent level or higher. In Model 2, inclusion of dummy variables for college degree, white race, and white collar employment before gender change increase the estimated difference between the age at gender change for FTM and MTFs to -10.36 , indicating that FTMs change their gender 10.36 years earlier than MTFs. Model 3 in Table 3 adds a dummy variable (*Same Job Before and After*), which indicates whether the respondent continued to be employed in the same job following their gender change. Inclusion of this variable reduces the estimated coefficient on the FTM dummy variable to -8.91 , but is still significantly different from 0 at the 1 percent level.

Interestingly, the estimated coefficient on the *Same Job Before and After* variable indicates that transsexuals who keep the same job following their gender change wait nearly 7 additional years to change their gender. To see whether this finding reflects the strategic behavior of transsexuals to delay their gender change when they have more stable employment, Model 4 adds to the regression model the number of years transsexual respondents report holding their jobs before their gender change (*Years Worked at Before Job*). The estimated coefficient on this variable is 0.67 and is statistically significant at the 5 percent level. This indicates that transsexual workers who have accumulated valuable workplace experience in a particular job choose to delay their

gender change and avoid a possible disruption to their employment. Taken together, Models 3 and 4 provide additional evidence that the age at gender change is strategically chosen to avoid workplace losses associated with a gender change.

Changes in Earnings Before and After Gender Change

Tables 4 and 5 examine the change in hourly earnings before and after the gender change using the approach outlined in the Methods Section. Table 4 presents the results for the raw change in earnings for transsexuals. Of the 43 respondents in the final sample who reported earnings before their gender change, 5 respondents did not report any employment after their gender change. The panel used to examine earnings changes therefore consists of 38 observations: 14 MTFs and 24 FTMs.⁷

The top panel of Table 4 calculates the simple average difference in earnings between the *before and after* gender change periods. MTFs on average experience a loss of \$3.16 in hourly earnings after becoming female. This average difference in earnings is statistically significant at the 5 percent level (p-value of 0.021). Given that average hourly earnings for MTFs are \$26.88 before their gender change, male-to-female transsexuals lose nearly 12 percent of their earnings. FTMs experience an average gain in earnings of \$1.41, although there is greater imprecision in this estimate than with the estimate for MTFs. The estimated average change in earnings for FTMs is statistically significant at the 17 percent level (p-value of 0.167). Given average earnings for FTMs before their transition are \$18.86, female-to-male transsexuals gain 7.5 percent higher earnings.

⁷ The mean difference between the before gender change and after change periods is 3.4 years for MTF respondents and 2.5 years for FTM respondents. Results per year are qualitatively similar and available on request from the authors.

To see if these differences in earnings are robust to the inclusion of control variables, Table 5 estimates multivariate regression models on the pooled MTF and FTM samples using the change in earnings as the dependent variable. Model 1 of Table 5 includes a dummy variable for FTMs and replicates the findings in Table 4. The estimated coefficient on the FTM dummy variable is positive and statistically significant at the 1 percent level. Looking across the four models in Table 5, as additional covariates are added to the regression analysis, the estimated coefficient on the FTM dummy variable remains positive and statistically significant at the 5 percent or higher significance level. These results suggest that the female-to-male transsexuals experience decidedly different changes in earnings following their gender change than their male-to-female counterparts. While the MTFs experience significant losses in hourly earnings from becoming female, FTMs experience no change in earnings or small positive increases in earnings from becoming male. The key finding is not that earnings for transsexuals are affected by their gender change, but that the direction of the earnings change is in the same direction as the gender advantage in the workplace. Men who became women lose substantially, but women who became men lose far less and in some specifications actually gain.

It is important to note that these multivariate regressions only capture the immediate change in earnings following a gender change. A longitudinal study of transsexual employment over a longer period may reveal more substantial changes. As we discuss in the next section, interview evidence indicates that FTMs experience more subtle changes in the labor market opportunities after becoming male as they gain increased authority and respect in the workplace. MTFs on the other hand experience a

decline in these same areas, and more MTFs than FTMs report experiencing harassment and discriminatory promotion and retention decisions (Schilt 2006a). We suspect that over time these changes would affect earnings even more substantially than we are able to document here.

5) Discussion

Although our sample of transsexuals is not a random sample from the general population, we argue that studying the experiences of transsexuals leads to important insights into how gender impacts workplace outcomes. While the male-to-female and female-to-male transsexuals in our study change their gender, their skills, abilities, and gender socialization remain the same. As we show in the Results section, becoming women for MTFs brings a reduction in earnings. MTFs also transition much later than FTMs in order to preserve the workplace rewards associated with the male gender. These findings suggest that omitted variables theories do not fully account for the role of gender in the workplace, as the transition to the female gender is negatively impacting MTFs.

Looking beyond earnings, MTFs in our sample seem to experience a wider range of workplace hardships in becoming women than FTMs experience in becoming men. Survey respondents were provided a blank space to write comments about their workplace experiences. Five FTMs elected to write comments. All five praised their workplaces for their tolerance and acceptance. One respondent in a blue-collar job wrote: “My transition went extremely smoothly. I was shocked at how smooth. No one even talks about it and it had no effect on my pay. If anything, I have been better accepted at work because people don’t see me as a dyke like before.” The two MTFs who wrote

comments, in contrast, emphasized workplace dilemmas. One respondent who transitioned in a blue-collar job she had worked in for twenty years as a man wrote that the women's restroom she used was "booby trapped," and mean notes were left on her desk telling her to quit. Another MTF wrote: "I was 'laid off' from my 10 year management position for having a 'bad attitude.'" She noted that she was laid off the first week that she began coming to work dressed in women's clothing. These comments certainly are not a systematic sample. However, they suggest that MTFs cannot take their male workplace advantage with them into womanhood.

Further supporting our argument that a workplace gender penalty often accompanies the move from male to female, Schilt (2006a) finds that MTFs experience a much wider range of obstacles to openly transitioning and remaining in the same jobs than their FTM counterparts. In a content analysis of news stories and legal cases about transsexual employment collected from Lexis Nexis and Westlaw between 1977-2005, Schilt shows that many MTFs experience harassment and often termination once they begin their gender transition, even when they transition in jobs they have held for many years. In these news articles and legal cases, some of the most virulent harassment is experienced by MTFs in blue-collar occupations (Schilt 2006a). This is an unsurprising finding, as blue-collar occupations are associated with homophobia and sexism (Welsh 1999). However, what is interesting about this blue-collar context is that in these news stories and legal cases, MTFs report fitting into this masculine workplace culture prior to their gender change. That pre-gender change MTFs conformed to and benefited from masculine workplace gender norms in blue-collar occupations suggests that they have a great deal to lose when they become women, even though they retain their human capital

and prior male socialization. We argue that the loss which accompanies becoming women accounts for why MTFs in our sample are slower to transition than FTMs, as well as why some MTFs live full-time as women outside of the workplace but continue to work as men (Griggs 1998).

In contrast, Schilt (2006a) found that FTMs experience fewer obstacles to open workplace transitions than their MTF counterparts. While blue-collar jobs still could be precarious locations for gender changes, FTMs in general reported satisfaction with their post-gender change workplace experiences. In in-depth interviews with twenty-nine FTMs in Southern California, Schilt (2006b) found that many female-to-male transsexuals experience an increase in authority, reward, and respect at work once they begin working as men – even when they remain in the same jobs they had as females. While they all were subject to female gender socialization as children, and had the same skills and abilities as they had as women workers, becoming men brought positive workplace outcomes. Not being male-socialized may mean that FTMs benefit less than male-born men, as male-born men may be socialized to be more aggressive about seeking workplace rewards (Padavic and Reskin 2002). However, FTMs are not penalized for their gender transitions, even though they – just like MTFs – are making a “discredited identity” (Goffman 1963) public. Placing our survey data in context with this previous research suggests that being a man garners more workplace rewards than being a woman, even net of all other omitted variables.

Is It Gender or Appearance?

In analyzing the before and after gender change workplace experiences of transsexuals, an important question is whether their workplace outcomes are due to

changes in gender or changes in appearance. Prior research suggests that the appearance and attractiveness of workers does affect their labor market outcomes (Biddle and Hammermesh 1994; Biddle and Hammermesh 1998). Since transsexuals undergo a number of changes to their physical appearance in the process of their gender change, they may be adversely affected by a non-normative appearance. The effects of hormone therapy, the physical structure of male bodies, and the different levels of appearance scrutiny men and women face in society often causes MTFs to face more difficulties passing in their new gender than their FTM counterparts. With the use of testosterone, many FTMs develop thicker facial and body hair, deeper voices, and male-pattern baldness (Rubin 2003; Green 2004). With these masculine appearance cues, they are read as men in interactions often within a few weeks of beginning hormone therapy. Estrogen has fewer feminizing effects on male bodies. MTFs may experience some breast growth, but they do not stop growing facial hair or develop higher voices (Griggs 1998). Estrogen cannot alter physical characteristics that are typically interpreted as masculine, such as height over six feet, visible Adam's apples, and big hands and feet. MTFs can use feminine appearance cues as passing aids, such as feminine clothing, but these often cannot override masculine body cues.

This difference in post-gender change appearance is clearly evident in our survey data. 56 percent of FTM respondents describe themselves as “always” passing as men. In contrast, 17 percent of MTFs describe themselves as “always” passing as women. Some MTFs who had been transitioned for over ten years still described themselves as only passing “sometimes.” Some of the adverse employment outcomes for MTFs which

we document above may be attributable to their changed appearance rather than to their changed gender.

However, we argue that gender is still likely a leading cause of the before and after differences we document for transsexuals. In Connell's (2006) study of ten MTFs in Texas, she finds that men co-workers expressed concern about their transsexual colleague's work abilities *as women*, not their appearance. Demonstrating this anxiety, one MTF who had co-owned a business with two other men was asked, post-gender change, if she was still going to be able to run a company if she was always "thinking about nail polish." Additionally, as many FTMs pass successfully as men within a short time of beginning hormone therapy, we can confidently argue that the workplace benefits they experience are related to becoming men.

6) Conclusion

This study uses the pre- and post-gender change workplace experiences of transsexuals as a type of experiment, which offers a novel method to explore the factors which contribute to the persistence of gendered workplace disparities. As existing surveys can neither measure discrimination directly nor measure all the relevant characteristics of men and women, we use the pre- and post-gender change workplace experiences of transsexuals as a unique test of omitted variables theories of workplace gender inequality. The statistical analysis of our transsexual survey data shows that the transsexuals in our study are relatively comparable to the general population before their gender transitions in many dimensions, although, notably, transsexuals are more educated. Analyzing the earnings of transsexuals before and after their gender changes,

male-to-female transsexuals experience a substantial and statistically significant decrease in earnings while female-to-male transsexuals experience either no change or a slight increase. This finding is consistent with previous interview data that suggest that FTM transsexuals gain respect and authority in the workplace, while MTF transsexuals lose these advantages of being men. These findings suggest that the male gender carries a workplace benefit that cannot be carried over in a gender change. That MTFs cannot take male privilege with them into womanhood may account for their significantly later age at transition than their FTM counterparts.

There are a number of limitations to this study. The small size of our sample reduces the precision of our statistical findings and precludes extensive multivariate analysis. A second limitation is our inability to control for the non-normative appearance of post-gender change transsexuals. Because of this limitation, the outcomes we document for gender change may be conflated with appearance discrimination. In an ideal experiment, we could compare a group of transsexuals who definitely pass as women with a group who do not to gain a deeper understanding of how appearance interacts with gender to affect workplace outcomes. A third limitation of our study is that gender change does not occur overnight as in the ideal experiment, but may in fact take several years.

Future research can build upon this study in several ways. First, replicating this study with a longitudinal study of transsexuals which tracks earnings and other workplace outcomes long after a transsexual's gender change could illuminate whether these gains and losses associated with gender change plateau or expand. Second, future studies could expand the analysis of before and after workplace outcomes beyond earnings and

more traditionally measured workplace outcomes. As we discuss above, many of the forms of gender inequality are subtle, but can become apparent in an in-depth, qualitative examination of the experiences of transsexual workers.

The recent news focus on Ben Barres, a neurobiology professor at Stanford who is a female-to-male transsexual, makes the impact of these subtle forms of gender inequality visible. As a female who excelled in math and science, Barres recounts constantly having her intellectual abilities questioned and undermined (Begley 2006). As a man, however, audiences, who do not know about his gender change, tell him that his scholarly research is much better than of “his sister.” Barres’ experiences show how socially constructed beliefs about men and women’s natural abilities cloud perceptions and evaluations, thus producing gendered workplace disparities. Our study demonstrates that using the experiences of transsexuals can illuminate these naturalized attitudes and is a fruitful way to explore these long-standing and important issues.

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Table 1: Comparison of General Population and Transsexual Population (Before Gender Change)

	All Males	MTF	All Females	FTM
Mean Age (std. error)	40.0 0.072	39.6 2.57	40.2 0.074	30.0 2.18
Median Age	40	39	40	29
Percent White	83.7	72.2	80.7	72.0
Percent College Degree	28.6	50.0	28.5	64.0
Percent Employed in...				
Private Sector	81.2	77.8	78.9	56.0
Government	13.1	16.7	18.7	32.0
Self Employed	5.6	5.6	2.4	12.0
White Collar Occupation	47.8	61.1	72.1	64.0
Observations	52,420	18	42,259	25

Notes: All Males and All Females refers to the sample of working adults from the 2003 Current Population Survey (CPS). CPS statistics are calculated using sample weights. Male-to-Female (MTF) and Female-to-Male (FTM) are transsexual survey respondents who reported working. Data for transsexuals is for the period before their gender change. Age is the age at the time the respondent completed the survey. Percent Full Time is the percent of each sample which reported working at least 35 hours per week and 40 weeks per year.

Table 2: Earnings Comparison of General Population and Transsexual Population (Before Gender Change)

	All Males	MTF	All Females	FTM
Have College Degree				
Mean Hourly Earnings (Non-Weighted) (standard error)	35.67 (1.15)	31.88 (5.09)	24.33 (0.32)	22.38 (3.82)
Mean Hourly Earnings (Age Weighted) (standard error)	35.67 (1.15)	30.36 (3.96)	24.33 (0.32)	23.12 (5.53)
No College Degree				
Mean Hourly Earnings (Non-Weighted) (standard error)	18.47 (0.48)	21.87 (5.09)	13.89 (0.18)	12.59 (5.09)
Mean Hourly Earnings (Age Weighted) (standard error)	18.47 (0.48)	21.66 (4.27)	13.89 (0.18)	13.39 (3.41)
Observations	52,420	18	42,259	25

Notes: Data shown are mean hourly earnings with standard errors in parentheses. All Males and All Females refer to the sample of working adults from the 2003 Current Population Survey (CPS). CPS statistics are calculated using sample weights. Male-to-Female (MTF) and Female-to-Male (FTM) are transsexual survey respondents who reported working. Data for transsexuals is for the period before their gender change. Age Weighted are mean hourly earnings for the transsexual sample weighted by the CPS distribution of ages. Hourly earnings are reported in 2004 dollars.

Table 3: Age at Gender Change

Variables	Model 1	Model 2	Model 3	Model 4
Intercept	39.56*** (2.57)	30.68*** (3.77)	28.34*** (3.80)	28.12*** (4.33)
FTM	-9.60** (3.36)	-10.36*** (2.94)	-8.91** (2.97)	-7.74* (2.94)
College Degree	--	10.62 (3.84)	8.03 (4.04)	9.76 (3.79)
White Race	--	6.32 (3.23)	4.56 (3.25)	3.36 (3.03)
White Collar Before Job	--	-0.66 (3.97)	0.09 (4.02)	-2.07 (3.90)
Same Job Before and After	--	--	6.85* (3.15)	2.42 (3.29)
Years Worked at Before Job	--	--	--	0.67* (0.26)
Observations	43	43	43	43
R-Squared	0.166	0.414	0.482	0.585
Adjusted R-Squared	0.145	0.352	0.396	0.488

Notes: Data shown are estimated OLS regression coefficients with standard errors in parentheses. FTM is Female-to-Male transsexuals. The dependent variable is the age at which the transsexual respondents reported completing their gender change. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (two-tailed tests).

Table 4: Change in Hourly Earnings After Gender Change (After – Before)

	Male to Female	Female to Male
Mean Difference in Hourly Earnings (After - Before)	-3.16*	1.41
(standard error)	(1.31)	(0.997)
t-statistic	2.42	1.41
p-value	0.021	0.167
Number with ...		
Positive Gain (%)	4 (28.6)	15 (62.5)
No Change (%)	2 (14.3)	1 (4.17)
Negative Loss (%)	8 (57.14)	8 (33.3)
Observations	14	24

Notes: Data shown in the top panel of the table are the estimated mean difference in hourly earnings for MTF and FTM transsexuals with standard errors in parentheses. “Number with...” indicates the number of sample respondents with a positive gain in hourly earnings, no change in earnings, or a loss in earnings following their gender change. The number in parentheses is the percent of the sample in each of these categories. * $p < 0.05$ (two-tailed test).

Table 5: Multivariate Analysis of Earnings Change (After - Before)

Variables	Model 1	Model 2	Model 3	Model 4
Intercept	-3.16* (1.31)	-7.65* (3.79)	-7.42 (3.81)	-5.95 (4.30)
FTM	4.57** (1.64)	6.18** (1.95)	5.83* (2.06)	5.77* (2.27)
College Degree	--	-1.59 (2.20)	-2.46 (2.36)	-1.36 (2.55)
White Race	--	1.77 (1.85)	1.99 (1.90)	1.93 (1.94)
White Collar Before Job	--	-1.41 (2.11)	-0.55 (2.21)	-0.92 (2.28)
Age at Gender Change	--	0.11 (0.09)	0.10 (0.09)	0.03 (0.11)
Same Job Before and After	--	--	0.43 (2.15)	-0.37 (2.31)
Years Worked at Before Job	--	--	--	0.22 (0.17)
Observations	38	38	38	38
R-Squared	0.177	0.289	0.330	0.367
Adjusted R-Squared	0.154	0.178	0.174	0.163

Notes: Data shown are estimated OLS regression coefficients with standard errors in parentheses. The dependent variable is the difference in hourly earnings: hourly earnings after the gender change minus hourly earnings before the gender change. * $p < 0.05$; ** $p < 0.01$ (two-tailed tests).