

IS IT SEX OR PERSONALITY?

THE IMPACT OF SEX STEREOTYPES ON DISCRIMINATION IN APPLICANT SELECTION

Doris Weichselbaumer

University of Linz

INTRODUCTION

A large number of studies investigate sex discrimination in the labor market. One common approach to test for discrimination is through a wage decomposition¹ that combines the estimated coefficients for male wages and the values of the explanatory variables for women (education, job experience, etc.). The difference between what women actually earn in the labor market and what males with women's human capital would earn is assigned to discrimination. A disadvantage of this method is that it gives "no conclusive proof of discrimination as long as all other possible relevant variables have not been identified" [Bovenkerk, 1992, 4] because wage differentials might be driven by unobservable productivity differences.

Firth [1982] as well as Riach and Rich [1995] measure sex discrimination using an experimental technique called correspondence testing. Although they adopt an undeniably appealing methodology previously used for race discrimination, they did not exploit a particular advantage of experimental investigation: the possibility of including usually unobservable characteristics and testing whether these can explain differences in labor market outcomes between men and women. Instead, they focus exclusively on individual characteristics such as formal education and job experience, which are typically available for wage regressions and wage decompositions respectively. As Heckman [1998] notes, experiments of this kind do not provide new insights, since differential treatment might be due to differences in individual characteristics that have not been controlled for.

This paper goes one step further than previous experimental studies by adopting correspondence testing to investigate the impact of usually unobservable variables. When testing for discrimination it may not be sufficient to control for human capital only. Specific personality traits that are more commonly associated with men than women in general seem to contribute to success particularly in many attractive, highly paid jobs. A successful manager, for example, is supposed to be ambitious, competitive, and dominant, which are stereotypically masculine traits. Alternatively, stereotypically feminine characteristics are preferred in many traditionally female occupations. A good nurse or kindergarten teacher, for example, seems to require

Doris Weichselbaumer: University of Linz, Altenberger Str. 6g, A-4040 Linz, Austria.
E-mail: Doris.Weichselbaumer@jku.at

feminine characteristics such as being gentle, cheerful, and friendly. Therefore, personality might affect productivity just as much as human capital. To have complete information on all productive characteristics of an employee when testing for discrimination, consequently, one would also want to control for personality besides typical human capital variables.

This paper investigates whether women have less access to attractive, traditionally male jobs because their sex-stereotypical personality does not fit the job. If women as a group are assumed not to possess the required characteristics for a male occupation, they will not be hired for such jobs. In this study we contrast the labor outcomes of a woman who possesses the required masculine characteristics with those of a traditional female. If a woman can demonstrate that she does not correspond to her sex stereotype and in fact does have the stereotypical personality traits of a man, she should be treated like a man. A woman with identical human capital and personality should be equally productive as a man—no other conceivable variables might determine productivity apart from knowledge and personality traits. Consequently, she should receive equal treatment. If such an equal treatment is not observable, we argue, discrimination has been documented.

To gain the necessary data, an experiment is conducted. The labor market outcomes of three hypothetical job applicants with identical human capital are compared. One man and two women, the latter differing in their perceived gender role, are applying for the same jobs. One of the women is perceived as stereotypically feminine, the other masculine. The goal is to investigate whether it is sex or personality that determines women's unfavorable position in the labor market. We find that even when controlling for personality, discrimination prevails in the labor market.

The paper is organized as follows: the next section elaborates the theoretical background of the study, the paper continues by describing the design of the experiment, followed by a presentation of the results and a conclusion.

THEORETICAL BACKGROUND

Measuring Discrimination

A standard definition of discrimination is that "individual workers who have identical productive characteristics are treated differently because of the demographic groups to which they belong" [Ehrenberg and Smith, 1994, 402]. The most well-known theoretical framework has been provided by Becker [1957], who modeled discrimination as the result of some majority group members' "taste" against working with members of a minority group.²

One common way to measure discrimination is to decompose wage differentials into explained components (differences in personal and job characteristics) and unexplained residuals by Blinder's [1973] and Oaxaca's [1973] method. Wages are estimated separately for individuals i of the different groups g (for example, males and females) according to the following model:

$$(1) \quad W_{gi} = \beta_g X_{gi} + u_{gi},$$

where $g = (m, f)$ represents the two sexes; W_{gi} the wage and X_{gi} the personal characteristics of an individual i of group g , β_g is a parameter and u_{gi} the disturbance term.

The difference in mean wages can then be written as:

$$(2) \quad \overline{W}_m - \overline{W}_f = (\overline{X}_m - \overline{X}_f)\hat{\beta}_m + (\hat{\beta}_m - \hat{\beta}_f)\overline{X}_f,$$

where \overline{W}_g and \overline{X}_g denote the mean wages and control characteristics of group g and $\hat{\beta}_g$ represents the estimated parameter from equation (1). While the first term stands for the effect of different background characteristics, the second term represents the unexplained residual due to differences in the estimated coefficients for both groups and is often referred to as "discrimination effect".

Traditional labor market data typically provide information only on some productive characteristics such as schooling, job experience, age, and so on. So while the employer has exact knowledge of *all* the productive characteristics of an employee and sets the wage accordingly, the researcher usually possesses only the data for the above-mentioned indicators of productivity. The lack of information on other variables that affect productivity can lead to an unexplained wage differential, which does not necessarily document discrimination. If the omitted variables correlate with sex, then the second term in equation (2) in fact captures not only discrimination, but unobserved group differences in productivity as well.³ Since it is not possible to distinguish between these two components, wage decomposition does not allow one to test for discrimination directly.

As a result it has been argued, for example, by Altonji and Blank [1999], that experimental techniques could examine more directly whether labor market discrimination exists. Experimental methods to measure discrimination typically focus on the hiring process instead of earnings and follow one simple procedure: the labor market outcomes of matched individuals, who possess "identical productive characteristics" but come from different demographic groups, are compared. If the two are matched in all conceivable productive characteristics but are not equally successful, this can be assigned to discrimination according to above definition.

Although very appealing, this technique—as Heckman [1998] has pointed out—is likewise unable to prove discrimination if the experimental design has not been carefully elaborated. Heckman points out the difficulty to control for all possibly relevant productive characteristics. In the framework of the experiment, this means that the tested employer is not provided with sufficient information on all relevant variables. If information on one variable is lacking, employers have to form expectations: when men are on average better than women in this dimension and no individuating information is available, then a man will be hired because his expected total productivity is higher. This argument follows the general idea of statistical discrimination, developed by Phelps [1972] and Arrow [1973], which posits that under conditions of incomplete information or uncertainty, individuals are judged on the basis of beliefs about group averages. Note that statistical discrimination is not regarded as discrimination according to the above definition because workers do not have identical productive characteristics on the average, and employers only make

profit-maximizing decisions under uncertainty—solely driven by productivity considerations but not discriminatory tastes.

In contrast to earlier experimental investigations, this paper considers the often-stated concern that convincing evidence for discrimination is still missing and that human capital, such as schooling and experience, may not be the only variables that determine the productivity of an individual. We argue that if it is not only human capital, it must be that personality affects productivity as a second component. Many researchers, for example, Schein [1973], have emphasized that different personality traits are considered successful in different occupations. Consequently, if an experiment controls not only for schooling and job experience but for personality as well, there will be little room left for statistical discrimination. After all, what could influence productivity apart from human capital and personality variables?

The goal of this study is to conduct an experiment where applicants are matched not only in human capital, but also in personality traits. If differential treatment remains, it really can be assigned to discrimination, because all relevant characteristics have been controlled for. In the following section the mechanism of how personality traits affect the hiring process is discussed in detail.

Personality and the Matching Process

Categorization of Personality Traits by Gender. Although the words sex and gender are often used interchangeably, they actually have distinct meanings. While *sex* refers to the biological state of being male or female, *gender* points to stereotypical roles and personality traits assigned to men and women by society.

Stereotypical characteristics are generally attributed to groups of people with certain observable demographic features (for example, biological sex or ethnic background) to structure complex data and to simplify the cognitive processing of information [Heilman, 1995].

Table 1 gives an overview of sex-stereotyped traits that constitute gender. Beliefs about the nature of the typical man and woman serve as indicators for masculinity and femininity. Generally, it can be said that men are considered task-oriented and active while women are perceived as emotional and expressive. A “typical man” is regarded to be ambitious, analytical, and assertive, while a “typical woman” is deemed affectionate, cheerful, and child-loving.⁴

The problem about stereotyping is twofold: on the one hand, stereotypes give rise to the belief that all individuals within a social category can be viewed as the same, which neglects the heterogeneity *within* the group. On the other hand, many doubt that sex stereotypes actually reflect reality, even on the average. In fact, clear evidence on the empirical value of sex stereotypes is lacking.⁵ For these two reasons sex stereotypes are not perfect predictors for individuals’ personality traits: a man can be very child-loving and understanding (feminine), while a woman can be assertive and competitive (masculine). That means that one’s gender does not have to match one’s sex, and that biological sex does not determine gender.⁶ Instead, all combinations of sex (male and female) and gender (masculine and feminine) are conceivable. This is crucial to the study.

TABLE 1
Sex-Stereotyped Traits Constituting Gender

Masculine Personality Traits	Feminine Personality Traits
Acts as leader	Affectionate
Ambitious	Cheerful
Analytical	Compassionate
Assertive	Eager to soothe hurt feelings
Competitive	Gentle
Dominant	Loves children
Individualist	Sensitive to the needs of others
Makes decisions easily	Sympathetic
Strong personality	Understanding

Selected items from the Bem Sex-Role Inventory (BSRI) for measuring psychological gender identity [Bem, 1974].

Categorization of Occupations by Their Sex-Types. Just as individuals are categorized by their sex and gender roles, occupations can be distinguished by their sex-type. Economists call an occupation “feminine” when the large majority of employees is female.⁷ Some psychologists stress an additional inherent characteristic of normative belief that reflect such unequal proportions as “how it should be” [Merton in Schein, 1973, 95].

There is clear evidence for horizontal and vertical segregation in Austria as in most western countries. The segregation index for the year 1993 is 56 percent [Weichselbaumer, 1999, 71], which means that 56 percent of women (or men) would have to change occupations, so that an identical distribution of sexes could be achieved. Traditionally female occupations are primarily caring and cleaning jobs (for example, cleaning personnel, hairdressers, housekeepers, nurses, textile workers, welfare workers), while traditionally male occupations are often characterized by the use of physical labor or financial/political power (for example, electricians, mechanics, architects, lawyers, politicians, managers).

Since some of the best-paid jobs (architects, lawyers, managers) can be found within the second category, the question arises why women tend to be clustered in unattractive, low-paid occupations with few career opportunities, while the more attractive ones seem to be reserved for men. Certainly sex discrimination can be one reason for the sex segregation we observe in the labor market, but there are a number of other relevant factors as well. For example, differences in human capital and in preferences for work characteristics (work environment, flexible hours, compatibility with family obligations, etc.) crucially affect one’s productivity and suitability for a job.

In this study an elaborate experimental design allows the isolation of the role of discrimination in sex segregation while holding all other factors constant.

The Role of Personality Traits in the Hiring Process. While standard economic theory often supposes that only the matching of the human capital required

for a job with the education and job experience of an applicant is relevant in the hiring process, psychological literature can challenge our thinking.

A number of psychologists [Heilman, 1984; Riehle, 1996] have emphasized that one factor determining who is hired for a job is "the degree of congruence between the gender of the applicant and the sex type of the job" [Glick et al., 1988, 178]. For example, Schein [1973] documented in her much-cited paper that managers (holders of a traditionally masculine job) believe that to be successful in their occupation it takes more of those characteristics typically ascribed to men than to women in general.

While in traditionally male occupations (such as management) employees are expected to possess traditionally masculine characteristics (for example, being ambitious, analytical, assertive, dominant), the requirements for traditionally female jobs seem to be very different. Hiring an assertive person as a nurse is usually not considered a promising choice; the ideal employee for such a position is regarded to be sensitive, sympathetic and gentle—in short: feminine.

We infer from this that there are two factors that can increase workers' productivity at a job: *human capital* and *matching personality traits*.

Situation of Incomplete Information. When personality is taken into account and a vacant position has to be filled, productivity of an applicant cannot be predicted with certainty, because the employer faces incomplete information on two ends: not only does she often miss reliable information about which personality traits are productive on a job, but she has to use stereotypes to form expectations on the applicant as well.⁸ The personality traits of applicants are usually not observable at the point of hiring. While it is possible to achieve knowledge on the productivity of certain personality traits in particular occupations in the long run, the lack of information about an individual applicant is a more severe problem leading to statistical discrimination. To form expectations about their potential future employees, entrepreneurs will make use of observable characteristics such as biological sex (or race) that are assumed to correlate with the unobservable variables. This means employers draw on sex stereotypes to predict the productivity of an applicant on the job. Consequently, a randomly chosen woman will be expected to have more feminine and less masculine characteristics than a randomly chosen man.⁹ As Heilman has stated in her Lack of Fit Model [1983], this leads to the fact that under incomplete information women are perceived as less suitable for typically better-paying male jobs, although there are many individual women who possess the required male characteristics.

Since formal education and, to some degree, job experience is often observable to an employer by means of school reports and resumes, the important contribution by Heilman to the theory of statistical discrimination is that personality characteristics could be one decisive unobservable factor that affects productivity and actually does need to be estimated. While all formal qualifications can be tested more easily, personality traits are difficult to evaluate. This might therefore be the crucial factor driving statistical discrimination against women.

Let us shortly summarize the matching process when the importance of personality traits and the effect of imperfect information is taken into account. In an occu-

pation with a large majority of men as employees, masculine characteristics are usually perceived as successful. If candidates are equivalent in formal qualification (for example, schooling, experience), the appropriate personality of the applicants becomes crucial. If there is no individuating information on personality traits, the biological sex is used as an indicator to infer from. An average man is presumed to be more likely to possess the required masculine characteristics and therefore—everything else equal—receives preferential treatment.

A number of studies [Cohen and Bunker, 1975; Rosen and Jerdee, 1974; Cash et al., 1977] have documented, by means of laboratory experiments, that the described matching between sex stereotype and sex-type of a job is taking place: equally qualified women are more successful applying for traditional feminine jobs, and men in masculine jobs.¹⁰

Situation of Complete Information. The need to make use of stereotypes only exists in a situation of incomplete information. If individuals have features that clearly distinguish them from their stereotype, their difference from the stereotype is well recognized.¹¹ Therefore, when a woman who is seeking a male position can give individuating information that she does not correspond to traditional sex stereotypes, she should face better chances of actually getting the job. Laboratory studies [Glick et al., 1988; Dipboye and Wiley, 1977; Heilman and Saruwatari, 1979] and an ex-post evaluation of hiring decisions [Van Vianen and Willemsen, 1992] have supported the hypothesis that appearing masculine increases women's chances of being hired in a masculine occupation. This lets us presume that in traditionally masculine occupations there is a positive effect from masculinity which is due to a reduction of statistical discrimination.

Violation of One's Stereotypical Sex-Role. While signaling a masculine gender identity reduces uncertainty about an applicant's personality and thereby statistical discrimination, there is an antagonistic effect conceivable at the same time. A number of studies show that women who violate their gender role are less liked and rated less favorably.¹² This could be described as a "distaste against *masculine women*" in the sense of Becker's "taste for discrimination" model: employers might not only have a distaste against women in general, but even more so against women who violate traditional gender roles.

The issue of interest in this study is which of the two effects (i.e., reduction of statistical discrimination on the one hand, increase of a taste for discrimination on the other) dominates or if they cancel each other out. While it might be beneficial to signal masculine characteristics since they are required for attractive male jobs, female masculinity could also evoke a taste for discrimination. This dilemma that women are caught in has best been described by the U.S. Supreme Court in the law case Hopkins vs. Price Waterhouse, where Ann Hopkins was denied partnership, because she was considered too "macho" and less lady-like: "An employer who objects to aggressiveness in women but whose positions require this trait places women in an intolerable and impermissible Catch-22: out of a job if they behave aggressively and out of a job if they do not." [Hopkins, 490 U.S. at 295 in Case, 1995, 45]

Hypotheses. In the following we shall first assume that there is no discrimination (motivated by taste) and that sex-stereotyped personality traits are productive. We have three types of candidates applying for a job: a male, a feminine female and a masculine female, all with the same human capital. The male and the masculine female are equally assertive, competitive and dominant, while the feminine female is more affectionate, cheerful and gentle. Who will be hired for what kind of job?

In a situation of *incomplete information*, where gender identity is not observable, the male will receive preferential treatment in a *masculine job*, while the two women will be treated the same. This is because the employer cannot distinguish between the two women. Masculinity is highly valued in the job, but the masculine female cannot be identified as providing the required characteristics and suffers statistical discrimination. In a *feminine job*, however, where feminine characteristics are required, the masculine female *benefits* from statistical discrimination. Although in fact she would be less suited for the job since she is lacking the feminine characteristics, she will be treated like the feminine female, because the employer just uses sex as an indicator for gender and expects both to have equivalent personality traits. The two women will be more successful applying for this job than the man.

What if the masculine female adopts visual and other cues to indicate her gender identity? If she manages to give individuating information that distinguishes her from the stereotypical woman, she should be treated like a man. After all, she possesses the same masculine characteristics as her male counterpart and can be identified as doing so. In such a *situation of complete information*, the masculine female and the man should be treated more favorably than the feminine female in a masculine job, while in a feminine occupation the two should be at a disadvantage against their feminine competitor.

If, on the contrary, the masculine female is treated differently than her male competitor even though she has and reveals identical human capital and personality traits, this pattern cannot be reconciled with statistical discrimination but only with a taste for discrimination.

EMPIRICAL STUDY

Method

As has been noted earlier, one common approach to test discrimination experimentally is to contrast the experiences of one individual with those of another with identical characteristics, when the two are only distinguishable by the different demographic groups they belong to. If two individuals can be identified as identical apart from their sex or ethnic background, differential treatment can be assigned to discrimination by definition. Experiments to measure sex or race discrimination¹³ can be conducted in laboratory and real life settings. While psychologists have a much longer tradition¹⁴ in experimental investigation of sex discrimination than economists, they have usually restricted themselves to laboratory studies. Economists, on the other hand, have conducted field experiments predominantly to examine race discrimination.¹⁵

One general drawback of previous experiments measuring sex discrimination is that testers usually have not been provided with sufficient information on all relevant productive characteristics and had to form expectations as a result. Consequently, differential treatment might have been due to statistical discrimination and not discrimination as has been claimed.

Laboratory Studies. The first widely cited laboratory experiment investigating the impact of sex on hiring decisions was executed by Fidell [1970]. She asked different psychology institutes to evaluate hypothetical applicants who were described in a short written paragraph. The occupation in question, the job of a department member in psychology, was a male-dominated one. It was found that when the candidate was given a female name, she was systematically offered a lower position than a male. This study was repeated by various authors for different types of occupations. A meta-study by Olian et al. [1988] over 19 experimental studies (from which 75 percent of the examined occupations were traditionally masculine ones) found that men do receive preferential treatment in hiring, but sex accounts for only 4 percent of the variance and is—not surprisingly—of far less importance than variables such as education and experience.

Cohen and Bunker [1975], Rosen and Jerdee [1974], as well as Cash et al. [1977] have carried out similar laboratory studies investigating *male* and *female* dominated occupations to test whether a matching of an applicant's sex and sex-type of a job is taking place when a position has to be filled. Their results show that women equally qualified as men are preferred for traditionally female jobs and *vice versa* for male jobs. Gerdes and Garber [1983] as well as Heilman [1984] argue that this pattern only holds true as long as there is some ambiguity about the productivity of the applicants. If the candidates can clearly demonstrate that they provide the required characteristics and prove their previous success with a resume or curriculum vita, no stereotyping is necessary and women are treated like their male competitors.

These results show that there *is* symmetrical, differential treatment between men and women in applicant selection: men receive preferential treatment in masculine and women in feminine occupations. The last two authors suggest that this pattern is due to statistical discrimination (that is, due to the belief that, on average, women and men fit best into different types of jobs) and not due to a taste for discrimination: If there are no doubts about an applicant's productivity, sex apparently does not matter.

An interesting result emerged from a study by Heilman and Saruwatari [1979], who test for the effects of physical beauty. Beauty increases men's employment chances consistently in all types of occupations. On the contrary, it proves to be an advantage for women only in feminine occupations, while their employment opportunities in male occupations are actually lowered. A covariance analysis shows that, in fact, it is the perceived *gender identity* mediated by the physical looks of female applicants that is driving the result: an attractive woman is perceived as *more feminine*, which increases her chances in a feminine job but reduces them in a masculine one when compared to a less attractive female.¹⁶ From this finding it can be concluded that *gender*, as a set of personality traits, plays a role in the hiring process, which has been postulated earlier.

Glick et al. [1988] have tried to examine the effect of gender on applicant selection with an interesting laboratory study. By providing information on an applicant's summer job, campus work-study job and extracurricular activity experiences, they attempt to indicate that the applicant possesses either stereotypically masculine, sex-neutral, or feminine personality traits. They find that masculinity increases women's chances in male jobs, but does not completely eliminate differential treatment. Since the information given in the experimental material (resume) is extremely brief, however, the possibility of mere statistical discrimination cannot be dismissed.¹⁷

Results from laboratory studies obviously cannot be reliably transferred into real life. In the laboratory the test person might be more supportive of women's equal rights, not only to give a socially desirable response, but also because the decision is "costless"—the test person does not have to live with the consequences of his own decision, (that is, does not have to work with the chosen employee he actually dislikes). Alternatively, a financial motive exists in real life that is not present in the laboratory: in real life the employer has a much stronger financial interest to correctly evaluate the true productivity of a potential candidate, and if he finds that the female is highly productive, he should hire her. On the contrary, the incentive of evaluating the productivity in a laboratory situation without any financial reward is rather low, which might lead to more traditional hiring recommendations.

Consequently, it is unclear in which direction real-life results might deviate from laboratory studies (if they do). The goal of this study is to examine how employers evaluate candidates of different sex and gender in real-life settings for masculine and feminine jobs, when provided with detailed information on personal characteristics (human capital, personality), where statistical discrimination can be dismissed.

Field Experiment

Field experiments can either investigate whether equally qualified people of different demographic groups are discriminated against in getting an interview (correspondence testing), or examine the entire hiring process (audit studies).

Correspondence testing, the method used in this paper, was first applied in 1970 by Jowell and Prescott-Clarke to measure race discrimination [Riach and Rich, 1991, 239] and later adopted by Firth [1982] as well as by Riach and Rich [1995] to examine sex discrimination. The procedure is the following: matched letters of application are sent out in response to job advertisements. The job seekers exhibit identical productive characteristics (for example, age, qualification, job experience), but have a male and female name respectively. Equal treatment is identified when all applicants are invited to a job interview,¹⁸ while discrimination is assigned if one applicant is invited but another is not. Since both previous experiments have been conducted in England and Australia, where relatively short resumes are common, the employers were not supplied with very detailed information about the candidates and might have been forced to form expectations on the value of variables that have not been controlled for. In particular, the resume had no information on personality traits, so the significantly differential treatment of men and women that was found, might be due to statistical discrimination.¹⁹ In Austria, on the contrary, a more detailed set of documents is required to be considered a serious applicant. Consequently, this vast amount

of information largely cancels out the possibility of statistical discrimination. Furthermore, in this study strong indicators for personality traits were given, attempting to provide an entrepreneur with complete information in *all* relevant dimensions.

Application Material. Austrian standards required that the application material included not only a letter of application but also an elaborate curriculum vitae, a fake school report, and a photograph. The failure to provide letters of references of previous employers did not usually become evident, since the fake applicants were still employed in their first job after a number of years in most occupational types. Obviously, the need to attach photographs of equally good looking applicants made the preparation of the application material considerably more demanding, but also served as an advantage for the research question: physical looks are one of the clearest indicators for gendered personality traits and could be used accordingly as a signal. We could not have investigated the effect of different gender types in a country where attaching a photograph to an application is not customary.




So that prospective employers were less likely to detect that the application was not real, names of employers were avoided in the resumes and job experience was formulated in a rather general way. All candidates applying for one particular occupation had identical human capital and obtained their education in exactly the same school-type, only at different locations. The school marks in the attached school reports were identical for all applicants in those subjects of primary relevance for the jobs under investigation, and equal on average in subjects of lower interest. The photograph was attached in the form of a (digitally manipulated) image color-printed on the resume, which is a common cost-saving practice used by Austrian job applicants.

Applicants. Application material was created for three fake applicants: one man and two women, the latter differing in their perceived gender role. While all three applicants obtained identical human capital, the two women vary in their personality: one of them is constructed as a stereotypically feminine woman, the other masculine.²⁰ Table 2 introduces our three applicants: the feminine woman, Patricia; the masculine woman, Alexandra; and, last but not least, the average man, Peter.

Gender Types. The different gender roles of the two female applicants were indicated by non-human-capital-relevant items in the resume (for example, hobbies, photograph), while all the human-capital, as well as non-gender-relevant aspects that might influence the probability of being invited for an interview (for example, looks), were held constant.

The application materials allowed us to use the following criteria as indicators for the two females' gender identities: physical looks, hobbies, choice of font, and layout of the resume. The manliness of the masculine female was indicated by her good but masculine looks, the short, dark hair, the broad shoulders and the business jacket. Her manly hobbies such as rock-climbing, canoeing, playing drums, and motorcycling, as well as the plain style of her resume's layout, served as further signals for her gender type. The feminine applicant, alternatively, appeared much more playful and traditionally feminine in her looks and leisure time activities as well as

TABLE 2
Applicants

	<p><i>Name: Patricia Vorbach</i></p> <p><i>My Hobbies: Drawing, designing and making of clothes</i></p> <p><i>Stayed in Portland, USA, as an Au-Pair for 1 ½ years</i></p>
	<p>NAME: ALEXANDRA AUER</p> <p>Hobbies: Sports (rock-climbing, canoeing), playing drums, reading, motorcycling</p> <p>Motorcycle tour through Australia for 1 ½ years (jobs in Perth, Alice Springs, Melbourne, Darwin)</p>
	<p>Name: Peter Englmaier</p> <p>Hobbies: Traveling, sports (jogging, mountain-biking, wild-water-rafting), music (guitar)</p> <p>Traveled for 1 ½ years (Australia, Hong-Kong, USA), various jobs</p>

in the layout of her resume. Her photograph indicates long, blond hair and flowing clothes, she enjoys drawing as well as designing and making clothes. While her colleague gained international job experience while traveling through Australia with her motorcycle, the feminine woman used to work in the United States as an *au pair*.

Pretest: Bem Sex-Role Inventory. A pretest was conducted to verify the successful representation of the two females' gender identity and to ensure that the differences of all job applicants in their self-presentation (in particular by the photograph) did not cause distortions in general favorability.

119 business students with an average age of 24 were asked to rate one applicant each—represented by his or her resume—according to the Bem Sex-Role Inventory (BSRI) [Bem, 1974], that provides a sufficient tool to test the dimensions "femininity", "masculinity", and "social desirability". Each of the three dimensions given by the BSRI consists of 20 items, which were evaluated on a 7-point scale.

Two items were important to be added to the social desirability dimension provided by the BSRI: beauty has repeatedly been shown to have major impacts on labor market decisions [Hamermesh and Biddle, 1994; Biddle and Hamermesh, 1998; Averetta and Korenman, 1996], similarly, "making a competent impression" seemed important to include in the pretest as well to ensure that photographs and other variations in the resumes did not cause one applicant to look relatively more proficient than others.²¹

TABLE 3
Mean from 7-point Scale, Standard Deviation and Number of Observations for the Different Dimensions of the BSRI for All Three Job Candidates

	Male	Masculine Female	Feminine Female
Masculinity Observations	45	40	34
Mean	—	5.37	4.3
Standard deviation		(0.56)	(0.99)
Femininity Mean	—	3.84	4.47
Standard deviation		(0.8)	(0.71)
Social Desirability Mean	4.75	4.57	4.54
Standard deviation	(0.65)	(0.63)	(0.57)

As Table 3 indicates, the two female applicants were rated differently in the dimensions of masculinity and femininity, while the scores for social desirability are relatively similar for all candidates.

Comparing the two females along the dimensions indicating gender identity, the feminine female achieved significantly higher scores in femininity (the *t*-test allowing the rejection of the H_0 hypothesis of equal means at the 1 percent level) and the masculine female in masculinity. (Since the masculine female's scores of masculinity were not normally distributed, a nonparametric Kolmogoroff-Smirnoff test was conducted, rejecting the hypothesis that both samples are drawn from the same population at the 0.1 percent level.)²² Comparing the scores of all three candidates on social desirability, we find that we cannot reject the hypothesis of equal means at the 5 percent significance level.²³

Occupations. The occupations investigated in this study were those for which a high enough labor demand existed so that a sufficient amount of standardized applications could be sent out in response to job advertisements. The possibility to create convincing application material (for example, by providing school reports) and to submit written applications (in many occupations phone calls are required to test the verbal fluency of applicants) further reduced the range of testable occupations.

The jobs of network technician, computer programmer, accountant, and secretary fulfilled all these requirements and allowed us to test two traditionally masculine and two feminine jobs. Table 4 presents the sex distribution, rate of unemployment and average income of the occupations contained in this study.

Sending Out the Applications. From early 1998 to fall 1999, the Saturday issue of the Austrian newspaper *Kurier* was examined weekly for relevant job announcements. The *Kurier* is the central source for job advertisements in the Greater Vienna area and beyond, which is the largest Austrian labor market. Applications of all three candidates were sent out to all vacancies that invited written applications, except those where the selection process was carried out through a personnel re-

TABLE 4

Female Representation, Unemployment Rate, and Average Income of Tested Occupations in the Austrian Labor Force

	Proportion of Females	Unemployment Rate	Average Income in Austrian Shillings
Masculine occupations			
Network technician	13 %	2 %	23,312
Computer programmer	13 %	2 %	23,312
Feminine occupations			
Accountant	77 %	4.3 %	15,254
Secretary	97 %	6.2 %	15,605

Proportion of females: Austrian Census 1991 [Osterreichisches Statistisches Zentralamt, 1993]; unemployment rate and average income of tested occupations from the Austrian Micro-Census 1997 (own calculations). The occupations network technician and computer programmer were not classified separately in the census, but constitute one subcategory of "computer technicians".

cruitment agency.²⁴ Enterprises advertising jobs repeatedly were contacted only once to avoid detection. For the same reason, the applications of the three different applicants that were sent to one firm were posted on different days of the week (Friday, Monday, Tuesday), rotating whose application was sent out first and last to avoid any systematic error.

If an employer was interested in one of the applicants, he or she could be contacted either through a Viennese address or by leaving a message on an answering machine. When one of the applicants was invited to an interview, the proposed appointment was canceled to avoid any inconveniences on the firm's side.²⁵

RESULTS

Unequal Treatment in Job Offers

First, the experimentally gained data are presented to give a systematic comparison of the success rates of different applicants, the male, the masculine female, and the feminine female, for the different tested occupations.

Masculine Occupations. When gendered characteristics matter and masculine traits are beneficial in masculine occupations, absent of discrimination, the masculine female, who proves to have the classic masculine characteristics, is expected to be treated like the male applicant. Alternatively, the feminine female should fare less successfully since she does not provide these required traits. Her unfavorable treatment would be based on a profit-maximizing decision and could not be assigned to discrimination. Consequently, when personality matters and there is no discrimination, we expect our applicants to be treated according to the following order: $m = mf > ff$. Different results either imply that personality traits are *not relevant* (when all people are treated the same: $m = mf = ff$) or that real discrimination exists (when the male and masculine female are treated differently: $m \neq mf$).

TABLE 5

Results of Correspondence Testing for all occupations

Applicants	Both Failed	Both Succeeded	1 st invited	2 nd invited	Net discrimin. against 2 nd	χ^2
			2 nd not (discrimin. against 2 nd)	1 st not (discrimin. against 1 st)		
A) Masculine Occupations						
Network technicians N = 117						
male – masculine female	20.51%	56.41%	16.24%	6.84%	9.40%	4.48 ^a
male – feminine female	22.22%	52.99%	19.66%	5.13%	14.53%	9.96 ^b
masc. female – fem. female	29.91%	51.28%	11.97%	6.84%	5.13%	1.64
Computer programmers N = 88						
male – masculine female	9.09%	76.14%	5.68%	9.09%	-3.41%	0.69
male – feminine female	7.95%	70.45%	11.36%	10.23%	1.14%	0.05
masc. female – fem. female	10.23%	76.14%	9.09%	4.55%	4.55%	1.33
B) Feminine Occupations						
Accountants N = 149^c						
male – masculine female	46.31%	25.50%	14.09%	14.09%	0 %	—
male – feminine female	42.28%	24.83%	14.77%	18.12%	-3.36%	0.51
masc. female – fem. female	48.99%	31.54%	8.05%	11.41%	-3.36%	0.86
Secretaries N = 123						
male – masculine female	47.97%	14.63%	5.69%	31.71%	-26.02%	22.26 ^b
male – feminine female	49.59%	13.82%	6.5 %	30.08%	-23.58%	18.69 ^b
masc. female – fem. female	44.72%	34.96%	11.38%	8.94%	2.44%	.36

Where there is one degree of freedom, the critical value of chi squared at the 5 percent level of significance is 3.84 (at the 1 percent level $\chi^2 = 6.63$).

a. One person is treated unfavorably more often than the other at the 5 percent level.

b. One person is treated unfavorably more often than the other at the 1 percent level.

c. This data contains 16 observations of firms anonymously advertising by use of a chiffré-number. Since these did not allow the association of the invitation for an interview with job requirements given in the ad, they have been rejected for further analysis. Interestingly, anonymous employers show no significantly different behavior, although their hidden identity would allow them to discriminate at lower costs.

In the case of *network technicians* the man proved to be the most successful, followed by the masculine female and the feminine female. From the 117 enterprises tested, 73 percent contacted the male applicant, 63 percent the masculine female and 58 percent the feminine female for an interview.

The results are set out in Table 5, which allows for a pair-wise comparison of applicants for every occupation tested. The top line of each job category always compares the results of the male applicant to those of the masculine female, the second line compares the male with the feminine female, and the bottom line the masculine with the feminine female.

Looking at the results for network technicians and comparing column 4 and 5 in Table 5, we find that the second person is always treated unfavorably more often than the first, which leaves us with a positive net-discrimination against the second person. Nevertheless, this difference is only significant when comparing the man with the women—but not when comparing the two women with each other. Although the masculine female appears somewhat more successful than the feminine (she suffers

a lower net-discrimination in comparison to the male), the hypothesis that the two women are treated the same cannot be rejected (see line 3). This implies that the applicants have been treated in the following order: $m > mf = ff$.²⁶

In the occupational group of *programmers*, applicants in general turned out to be overwhelmingly successful. With a probability of more than 80 percent, an applicant was invited to a job interview, which means that our candidates were considered sufficiently attractive for almost any job opening. Out of 88 firms, 81 percent contacted the male, 85 percent the masculine female, and 81 percent the feminine female for an interview. Even a systematic reduction of the applicants' human capital (from a high to a poor university degree to eventually holding a moderate high school degree only) did not cause any change in employers' behavior. No differences in treatment were observed; all applicants did equally well: $m = mf = ff$.

The high general acceptance is because the labor market was very tight in this occupation, caused among other things by Y2K. Just as an excess supply of workers allows discriminators not to be punished by lower profits (for each female applicant an equally qualified male is available), a tight labor market makes profit-maximizing more binding. That is, when employees are scarce firms have no room to be choosy in terms of sex if a certain productivity is being guaranteed! This observation is compatible with the predictions of Becker's [1957] taste for discrimination model.

Feminine Occupations. Under the assumption that feminine characteristics are particularly productive in traditionally female occupations, we argued that the feminine female should receive favorable treatment in the absence of discrimination, since she has identical human capital but scores highest in feminine traits. The masculine female as well as the male applicant should fare less successfully, since they lack these required characteristics. Consequently we expect the following order: $m = mf < ff$. Equal treatment of all candidates ($m = mf = ff$) would suggest that personality does not matter in the occupation under investigation, differential treatment of the male and masculine female ($m \neq mf$) indicates the existence of a taste for discrimination.

For *accountants* we find no evidence for differential treatment. In total 149 firms were contacted, out of which 43 percent contacted the feminine female, while an equal percentage of 40 percent were interested in meeting the male and the masculine female applicant respectively. Even though the feminine woman was slightly more successful than her competitors, the hypothesis of equal treatment could not be rejected and hence, statistically, all applicants were treated the same: $m = mf = ff$.

The most severe unequal treatment is found in the occupation of *secretaries*. Out of 123 firms contacted, the masculine female was invited by 46 percent of all employers, followed by the feminine female with 44 percent. The male applicant was clearly defeated with a success rate of only 20 percent. Table 5 shows that the male was treated unfavorably significantly more often than the females at the 1 percent level. In 32 percent (30 percent) of all cases he was not invited for an interview, while the masculine (feminine) female was. Alternatively, he only received beneficial treatment in 6 percent (7 percent) of all cases, where he was invited but his female competitor was not. At the same time, the hypothesis that the two women with differing gender identity received equal treatment could not be rejected: $m < mf = ff$.

The question of this paper is whether it is perceived differences in personality traits that drive women's labor market outcomes relative to men's. Our experiment allows the comparison of the hiring chances of a man and woman who are matched not only in human capital but also in personality. If there is no discrimination, the masculine female should be treated like the male in all cases, while the feminine female should receive preferential or unfavorable treatment depending on the sex-type of the occupation.

Here we find the opposite to be true. Significant differential treatment was found in the occupation of the network technician and secretary. Both times the two women were treated the same, while the man was significantly more or less successful. This means that differential treatment is not driven by gendered personality traits but by biological sex, which is an indication that we are indeed observing *discrimination*. Our finding cannot be reconciled with statistical discrimination, since the applications contained very detailed information, not only on human capital, but also on personality.

The Effect of Job Requirements

Up to now only the occupation individuals applied to has been considered in our analysis. Table 6 presents the estimates for the probability of being invited to an interview, first only as a function of occupations. Then variables describing the job requirements of a position are added.

In column 1 only the sex and gender type of an individual, as well as the occupation, are used to explain the invitation probability. For the base category of the network technician, being a male instead of a feminine female increases the probability of being invited to an interview. Chances are generally lower for secretaries and accountants and higher for programmers. The probability that a male is invited for an interview as a secretary is significantly lower than that of an equally qualified feminine female; the same is true in the profession of accountants. No significant differences were found comparing the feminine with the masculine female. This basically reflects the previous findings of Table 5.

In the next step we use additional information about the jobs to investigate whether certain job requirements influenced the probability of invitation for our applicants. All the available information from the job advertisements was coded in a number of variables that captured human capital and personality trait requirements, and indicated whether the actual text of the advertisement was addressed to women or men specifically instead of being formulated in a sex-neutral way. In the German language, contrary to English, the sex of a job holder is usually explicit by sex-specific formulation (as in actor/actress). This allows employers to aim at members of one specific sex by choosing sex-specific terminology in their job advertisement. Firms often claim, however, to use sex-specific terminology (feminine for female-dominated, masculine for male-dominated jobs) out of tradition and for convenience only, without having any actual preferences for a certain sex.

In fact, the Austrian equal treatment law from 1990 (BGBl.Nr. 108/1979, modified by BGBl.Nr. 410/1990) demands sex-neutral advertising of vacancies and

TABLE 6
Invitation Probability

	(1)	(2)	(3)
Base: feminine female (ff)	—	—	—
Masculine female (mf)	0.044 (0.67)	0.021 (0.62)	0.023 (0.65)
Male (m)	0.147 (2.21) ^a	-0.047 (1.41)	-0.050 (1.45)
Occupation (base network technician):			
Secretary	-0.144 (2.26) ^a	—	-0.275 (5.35) ^b
Accountant	-0.139 (2.19) ^a	—	-0.231 (5.48) ^b
Programmer	0.255 (3.54) ^b	—	0.222 (4.37) ^b
Secretary×mf	-0.006 (0.07)	—	—
Secretary×m	-0.388 (4.46) ^b	—	—
Accountant×mf	-0.083 (0.92)	—	—
Accountant×m	-0.179 (1.97) ^a	—	—
Programmer×mf	0.010 (0.09)	—	—
Programmer×m	-0.132 (1.19)	—	—
Required human capital:			
Knowledge	—	0.075 (1.94)	0.000 (0.01)
Experience	—	-0.058 (2.18) ^a	-0.058 (2.07) ^a
English	—	-0.046 (1.36)	-0.019 (0.54)
Other qualifications	—	-0.012 (0.35)	-0.051 (1.40)
Required personality traits:			
Young/flexible	—	0.033 (1.17)	0.029 (0.99)
Sociable	—	0.049 (1.99) ^a	0.026 (1.02)
Independent	—	-0.035 (1.50)	-0.012 (0.49)
Powerful/dynamic	—	-0.005 (0.21)	0.008 (0.32)
Nice/friendly/correct	—	-0.101 (3.85) ^b	-0.062 (2.30) ^a
Other characteristics	—	-0.077 (1.43)	-0.056 (1.00)

TABLE 6 (cont.)
Invitation Probability

	(1)	(2)	(3)
Characteristics of job/advertisement:			
Job prestige	—	0.015 (3.27) ^b	0.004 (0.72)
Photo required	—	0.050 (1.22)	0.116 (2.86) ^b
Job-term male	—	0.108 (3.00) ^b	-0.044 (1.07)
Job-term female	—	-0.188 (4.75) ^b	-0.072 (1.52)
Pseudo R ²	0.112	0.057	0.1147
Observations	1397	1373	1373

Probit estimation, coefficients represent marginal effects. Absolute value of z statistics in parentheses.

a. Significant at the 5 percent level; b. Significant at the 1 percent level.

Required human capital: knowledge=[0,1], job-specific knowledge required: no, yes; experience=[0,1,2], job experience required: no, yes: ≤5 years, >5years; English=[0,1,2], English required: no, yes, fluent; other qualifications: number of other required job qualifications.

Required personality traits (number of all required traits fitting into one category): young/flexible: young, flexible, swift; sociable: sociable; independent: independent, sense of responsibility; powerful/dynamic: committed, dedicated, self-initiative, innovative, ambitious, self-confident, dynamic, motivated; nice/friendly/correct: nice, friendly, correct, exact, reliable, loyal, sense of style, neat appearance; other characteristics: e.g., non-smoker.

Characteristics of job/advertisement: job prestige=job hierarchy×size of advertisement; photo=[0,1], attachment of photograph required: no, yes; job-term male=[0,1], job-term female=[0,1], base: neutral job-term.

TABLE 7
Proportion of Gender-Neutral and Sex-Specific Formulations of Job Advertisements in Feminine and Masculine Occupations

	Sex-Neutral Formulation of Ad	Female Formulation of Ad	Male Formulation of Ad
Feminine occupation	62 %	33 %	5 %
Masculine occupation	61 %	0 %	39 %

prohibits the signaling—even implicitly—of any preference for one sex. Nevertheless, the number of firms advertising sex-specifically is surprisingly large. As Table 7 demonstrates, only 62 percent of the advertisements investigated conform to the law.²⁷ As expected, the sex-type of a job strongly determines at which sex job advertisements are directed: 33 percent of the advertisements in feminine occupations are explicitly or implicitly aimed at women, 39 percent of those in masculine occupations are directed at men.

In total, the following information was extracted from those job advertisements to which applications were submitted and captured mostly by dummy variables:

1. *Required human capital*: special knowledge, experience, literacy in English, other qualifications;
2. *Required personality traits*: young and flexible, sociable, independent, powerful and dynamic, friendly and correct, other characteristics;
3. *Characteristics of advertisement/job*: occupation, job prestige (combination of job-hierarchy and size of advertisement), required attachment of photograph; *sex-specification of advertisement*: sex-neutral, female, male formulated job announcement.

These additional variables were included in columns 2 and 3 of Table 6. How do required characteristics affect the invitation probability of our applicants? So that the candidates could indicate less previous job experience in the resumes, which might be easily discovered as false and risk detection, the candidates were rather young. Consequently, our applicants had lower chances of interviewing when employers asked for more experience. At the same time, the three applicants looked rather fashionable, which possibly made them less desirable for positions needing particularly good manners and precision (being nice/friendly/correct). Alternatively, this style may also explain why according to column 2 they also had better chances at jobs with higher prestige and those requiring sociability. The strong effects of the different job terms in column 2 are due to the fact that the terminology strongly correlates with the sex-type of the job, something not controlled for by this specification. The effects disappear in column 3 where we account for occupations.

Firms which ask applicants to attach their photo to their applications probably care more about the beauty of their employees than others. Since all our applicants had particularly good looks, they might have had better chances to be invited at those firms which appreciate beautiful employees as indicated in column 3.

What is of central interest for our research question, however, is whether job characteristics or required personality traits affect applicants differently. For example, it might be that men, and possibly also masculine women, are preferred for jobs where self-initiative, ambition and self-confidence are required while feminine women have better chances when applying for jobs requiring gentleness and reliability.

What Determines Differential Treatment?

To estimate the impact of these variables on the relative success rate of two applicants and to avoid adding a huge amount of interaction terms in our probit estimation, we ran an ordered probit regression of the following type:

$$(3) \quad Y_i = \alpha X_i + \varepsilon_i .$$

The outcome Y_i is a dummy variable that analyzes the relative success of a candidate in comparison to another, X_i is a vector of control variables and α the corresponding vector of estimated coefficients. ε_i is the error term. As in Table 5, we compare the results of two candidates applying to the same job, but now all the variables on job requirements find additional consideration.

The dependent variable was coded as follows:

- 2 ... the first person was preferred to the second
- 1 ... both received equal treatment
- 0 ... the second received preferential treatment

Consequently, a positive coefficient works as an advantage for the first candidate.

Table 8 shows the results for all occupations, since they do not vary with respect to profession. Column 1 presents the pair-wise comparison of the male and the masculine female, column 2 the male and the feminine female, and column 3 the masculine female and the feminine female.

As can be seen, the "required sex" indicated by sex-specific formulation of a job announcement solely determines differential treatment—with one single exception of job prestige. Interestingly, neither requirements on human capital nor personality explains different labor market outcomes, even though the feminine female was perceived to have personality traits others did not have. This is remarkable, because it means that employers do not prefer an applicant of a certain sex or personality depending on job requirements. They rather seem to act according to general preferences for a certain sex, which are reflected in the sex-specific terminology. The variables capturing the *sex-specific formulation* of an advertisement clearly have the strongest impact on differential treatment. An advertisement that uses a male instead of a sex-neutral term for a vacant position, increases the male's chances in comparison to the females', while a female term leads to a preferential treatment for women compared to men. Nevertheless, these two dummy-variables have no significant impact on differential treatment of the two women with differing gender identities (column 3).

This result indicates that sex-specific terminology is not used coincidentally in job advertisements.²⁸ If the male form is used, the employer is looking for a male applicant, while a female form implies that a female employee is wanted. Thus, the common argument that male terminology is used for convenience only (not intending to exclude females) is not supported here.

Nevertheless, an interesting effect of a female's "manliness" is observable: While in column 2 the effect for the male and feminine female is symmetric when they are applying for a sex-term incongruent position²⁹, the coefficient for a male job-term explaining the differential treatment of the male and masculine female is not only considerably smaller, but also significant only at the 10 percent level (column 1).³⁰ This indicates that a male job-term does not lead to an equally strong unfavorable treatment of the masculine female than the feminine female in comparison to the male, even if we find no significant impact comparing the masculine with the feminine female (column 3).

From this it can be concluded that signaling manliness does not decrease women's chances in a female-specified vacancy, but it might slightly reduce unfavorable treatment in a male-termed job.

The small but significant effect of the variable job prestige, when comparing the male with the masculine female, is rather unexpected. As pointed out before, this variable captures the hierarchy of the job and the advertisement size (by multiplica-

TABLE 8
Pairwise Comparison of Invitation Probability

	Male vs. Masculine Female	Male vs. Feminine Female	Masculine vs. Feminine Female
Knowledge	-0.047 (0.161)	-0.086 (0.158)	-0.055 (0.172)
Experience	0.131 (0.109)	0.059 (0.107)	-0.084 (0.117)
English	0.124 (0.139)	0.043 (0.137)	-0.092 (0.150)
Other qualifications	0.181 (0.146)	0.001 (0.145)	-0.202 (0.153)
Young/flexible	-0.076 (0.117)	0.008 (0.114)	0.098 (0.123)
Sociable	0.049 (0.101)	0.022 (0.100)	-0.026 (0.108)
Independent	0.006 (0.096)	0.026 (0.094)	0.024 (0.102)
Powerful/dynamic	-0.159 (0.097)	-0.118 (0.096)	0.045 (0.103)
Nice/friendly/correct	0.018 (0.108)	-0.031 (0.105)	-0.064 (0.115)
Other personality traits	-0.111 (0.217)	-0.153 (0.215)	-0.078 (0.234)
Job prestige	-0.037 ^a (0.018)	-0.021 (0.018)	0.017 (0.020)
Photo required	-0.014 (0.167)	-0.119 (0.164)	-0.147 (0.179)
Job-term male	0.254 ^c (0.151)	0.423 ^b (0.150)	0.241 (0.160)
Job-term female	-0.433 ^b (0.161)	-0.432 ^b (0.159)	-0.029 (0.171)
Pseudo R ²	0.035	0.036	0.016
Observations :	462	462	462

Ordered probit estimation: all occupations. Standard errors are in parentheses.

a. Significant at the 5 percent level; b. Significant at the 1 percent level; and c. Significant at the 10 percent level.

tion of the two). The reason for paying attention to advertisement size is that employers are willing to spend more on advertisements if they have more financial resources (suggesting higher pay) and if the position is more important. The size of an advertisement, therefore, might be used in addition to hierarchy of a job as an indicator for the importance of a position. The negative coefficient means that the more prestigious a job, the worse are the chances for the male relative to the masculine female. A possible interpretation of this might be that the masculine female represents a much more unconventional, almost exotic type of personality, while still fulfilling the others' standards of beauty, etc. A more prestigious position might allow for a more unconventional behavior and personal individuality. It might even be considered an integral part of a leadership personality, while it is sanctioned at a

low-status job. This might lead to the result that the more sophisticated masculine female has a relative advantage in more high-ranked positions in comparison to the traditional male.

CONCLUSIONS

Previous studies trying to measure discrimination could not satisfactorily prove that the observed differential treatment of men and women was actually due to discrimination and not to personal characteristics that have not been controlled for. Both econometric studies and labor market experiments have failed to consider one aspect that might determine productivity (apart from human capital) the most: *individual personality*. Sex segregation in the labor market could be driven by the requirement to obtain matching personality traits (masculine traits in male occupations, feminine in female jobs) when hiring decisions are made under uncertainty drawing on sex stereotypes.

This study adopted an experimental technique called correspondence testing to examine whether presumed differences in personality traits of men and women lead to different labor market outcomes. Using this methodology in a country like Austria, where very detailed application material is required, offers one big advantage: detailed information on human capital minimizes the possibility of statistical discrimination concerning individuals' qualifications for a job. Furthermore, strong signals were given to indicate different personalities of applicants.

If differential treatment of the sexes in earlier studies was due to statistical discrimination, we argue that it should disappear in the setting of this experiment, which controls for a maximum of variables. When personality leads to different labor market outcomes of men and women, in the absence of discrimination an identically qualified male and female with observable, equally masculine personality traits should be treated the same, while a more feminine person should receive preferential treatment in feminine occupations and unfavorable treatment in masculine occupations.

We observed the contrary: equal treatment of the two women and different treatment of the man, indicating that biological sex and not productivity-relevant personality drives labor market segregation. Unfavorable treatment in masculine occupations is not significantly reduced when a woman provides a masculine identity. Similarly, preferential treatment in feminine occupations is not threatened by "manliness".

Even though there are minor indicators that masculinity might slightly reduce unfavorable treatment in some cases, the unexplained residual of differential treatment remains, even after controlling for personality traits. This suggests that it is not different productivity, nor different personality, but *discrimination* that leads to differential treatment and sex segregation at the workplace.

NOTES

Thanks to the "Sparkassen Förderungs Fond" for financial support of this project. I particularly thank Rudolf Winter-Ebmer, Lee Badgett, Nancy Folbre, Michael Landesmann, Susanne Pech and Joseph Reagle for their helpful comments and suggestions. Tina Auer, Peter Egger, Franz Englmaier, Andreas

Feichtinger, Sabine Ferdik, Christian Holzleitner, Sandra Leitner, Markus Mertz, Robert Stehrer, members of the Economics Department of the University of Linz and my family provided invaluable assistance in conducting the experiment. I have benefited from helpful comments from seminar participants at the ASSA meetings, Boston; European Economic Association, Bolzano; Verein für Socialpolitik, Berlin; IAREP, Baden; ESPE, Torino; Austrian Labor Market Workshop, Vienna; IZA Labor Market Workshop, Buch am Ammersee; IAFFE, Amsterdam. All data of the experiment, standard letters of application, resumes, school reports and photographs are available from the author.

1. See Altonji and Blank [1999] for a survey.
2. If employers maximize utility instead of profits, they will not hire equally and possibly even more productive people from the minority group. Since this type of discrimination does not serve profit-maximizing goals, discrimination should not persist in the long run in a perfectly competitive market where non-discriminatory employers can produce at lower costs. As a result, discriminatory tastes should vanish over time.
3. Note that in fact the first term of equation (2) can be affected by discrimination too: pre-market discrimination can have a strong effect for example, on the human capital of individuals.
4. Out of approximately 200 human traits, Bem extracted those that were considered as differently socially desirable for men and women. The BSRI consists of 20 "feminine" and "masculine" characteristics each - supplemented by 20 "neutral" characteristics—considered as equally socially desirable for men and women. In Bem's understanding, femininity and masculinity constitute two independent dimensions and not opposites on a bipolar continuum—therefore an individual can score high in masculine and in feminine characteristics at the same time. If a person is equipped with approximately similar amounts of feminine and masculine traits, he or she is called "androgynous" according to Bem.
5. For a review of studies testing the empirical value of sex stereotypes see Heilman [1995].
6. Feminist scholars, for example, in philosophy and rhetoric understand gender as a performative act constituted through "doing" or "enacting gender" [Butler, 1990; Ussher, 1997].
7. The cut-off point is usually drawn at the proportion of one sex of 70 percent or 80 percent [Wootton, 1997, 19].
8. Chiplin and Sloane [1976] have argued that usually personality characteristics of previous job-holders (being white, male, middle-aged) are considered "successful", while in fact they do not necessarily have to be relevant to productivity.
9. One might presume that *incorrect* "stereotypes" will be revised through Bayesian updating in the long run just as incorrect beliefs. This is conditional on the fact that members of the incorrectly assessed group have a chance of proving their *true nature* and do not adapt to the stereotype. But women confronted with sex stereotypes might have an incentive to behave in socially more rewarded feminine ways, which means that stereotypes have a self-enforcing character. As a result, no objective assessment of *real and stable traits* can take place.
10. The results of an audit study by Neumark et al. [1996] could be interpreted along similar lines. They found that men were more successful applying as waiters for high-priced restaurants, while women received more job offers at low-priced ones. It is most likely that the different sex-types of the jobs were responsible for this outcome. Levinson [1975] conducted another field experiment, where equally qualified male and female students applied for masculine and feminine jobs. It was found that women suffered clear-cut discrimination in 28 percent of the cases when applying for a masculine job, while men's chances for an out-of-role job were even lower—they were clearly discriminated in 44 percent of the cases.
11. As Fiske et al. [1991, 1050] have emphasized: "Stereotyping is most likely when evaluative criteria are ambiguous" and "[the] most open to interpretation".
12. For example, assertive women are less popular, women supporting equal rights are considered less likable and feminists are rated less favorably than housewives. For a review of these studies see Riehle [1996]. Laner and Laner [1980] argue that one of the reasons why gays and lesbians are sometimes disliked is due to the fact that they more commonly violate traditional gender roles.
13. In general, similar experimental techniques can be used to investigate sex or race discrimination. Novelist John Howard Griffin conducted one of the first experiments to investigate race discrimination: In 1960 he published his book "Black Like Me" [Griffin, 1996], where he reported the experiences he encountered in America's Deep South after taking on an Afro-American look by using some skin-color device. 25 years later, Günther Wallraff repeated a similar experiment in Germany, when he

adopted the looks and name of a Turkish citizen and summarized his observations in his book "Ganz Unten" [Wallraff, 1988]. Both of these reports documented unfavorable treatment based on ethnic origin and had a big impact on public opinion, since an immediate comparison was given: The treatment these writers received changed dramatically after they had manipulated only one variable: their skin-color (and perceived ethnic background, respectively). Even though these two experiments were executed by writers, the methodology is sound and similar techniques have been used for scientific purposes.

Not only has skin color been artificially altered in the past: a number of historical records exist on women, who, for various reasons, adopted male identities. Often a male identity gained them not only respect, but access to jobs in masculine fields that at times were the only ones which allowed them to support themselves financially. Furthermore, it provided the possibility to travel. See Dekker and van de Pol [1990]; Wheelwright [1990].

14. In 1968 Goldberg conducted his famous experiment, where he found that the same articles were received more favorably when the author's name indicated a male writer than when a female name was given. The result was, however, significant only for those articles covering a traditionally masculine topic and for one of two dealing with a gender-neutral issue. There was no significantly different treatment for authors who wrote on a feminine topic. These results—known as the Goldberg-paradigm—motivated a large body of research repeating the original study. Swim et al. [1989] conducted a meta-study over 123 experiments and found—contrary to the original result—a negligible effect of sex in performance evaluation.
15. While there are only three experimental studies that examine sex discrimination within economics [Firth, 1982; Riach and Rich, 1995; Neumark et al. 1996], there are a large number of experiments investigating race discrimination in a whole range of different contexts [Firth, 1981; Yinger, 1986; Newman, 1978; Riach and Rich, 1991; Cross et al. 1990; Turner et al., 1991; Kenney and Wissoker, 1994].
16. On the contrary, Marlowe et al. [1996] observed that women of low physical beauty received the worst treatment of all applicants even in masculine jobs.
17. The only information given in the resumes was that the applicant was a recent college graduate who financed 30 percent of his or her own education and a short list of activities.
18. Obviously, testing whether somebody gets invited for an interview captures differential treatment at the initial stage of hiring only, while some employers might delay their "discriminatory activity" until later. Still, the possibility to receive a job offer is conditional on being invited to an interview, which means that differential treatment in hiring has to be equal or larger to what is measured by Correspondence Testing [Riach and Rich, 1995]. Researchers at the Urban Institute, for example, Kenney and Wissoker [1994] have extended this method to the next stage of the hiring process: In their "Audit Studies" they have not only sent out written applications but also matched pairs of real applicants of different ethnic groups who actually met employers for an interview. This allows observing discrimination in actual job offers, although it suffers from the disadvantage that real life applicants who meet all the required criteria are hard to find. Furthermore, it is impossible to control for differences in real life interactions that might take place during an interview. Neumark et al. [1996] conducted the only small scale study adopting this method to measure sex discrimination in restaurant hiring.
19. While Firth [1982] only examined the market for accountants, Riach and Rich [1995] examined seven different occupations in total. They found that two of the most masculine jobs (computer analyst and gardener) were also those where women received significantly unfavorable treatment.
20. There are several reasons for our choice that the gender identity of the male was not varied accordingly. First of all, the primary interest was whether sex stereotypes put women in a unfavorable situation in the labor market. The question whether men might be discriminated in feminine occupations seemed of less practical importance, since these are typically less attractive and of lower pay. Secondly, a feminine looking man evokes much more social rejection than a masculine woman [Levinson, 1975]. While there is some understanding that women might "aspire" to masculinity (since stereotypically masculine characteristics like strength and leadership abilities are commonly perceived as more positive traits), this tolerance seems to be lacking when a man renounces his male privileges to appear feminine. Last but not least, "out-of-role" males are more often perceived as gay than out-of-role women as lesbian [McCreary, 1994]. This association of gender and sexual identity would have made it impossible to disentangle the discriminatory effects caused by the violation of stereotypical gender and sexual orientation norms.

21. While the BSRI was originally used to provide information about the self, it served to increase knowledge on how a particular other is perceived in the present study. Devlin [1997] adopted the test for the same purpose.
22. The values of femininity and masculinity are not reported for the man, since it seems unclear how to interpret them for different sexes. To be equally assertive might be considered more striking for a woman and therefore lead to higher scores. In fact, the masculine woman received significantly higher scores in masculinity and significantly lower ones in femininity than the man. This means for the experiment to be on "the safe side": If the masculine woman is treated more unfavorable than the male in masculine jobs, it can not be due to a lack of masculinity.
23. man - masculine female: $t = -1,426$; $t_{(68,5\%)} = -1,666$
man - feminine female: $t = -1,243$; $t_{(77,5\%)} = -1,667$
masculine - feminine female: $t = 0,631$; $t_{(72,5\%)} = 1,668$
24. Recruitment agencies distribute their applicants to a number of different employers, which does not allow the assignment of their response to one identifiable vacant position.
25. Correspondence testing does impose some costs on the employer as the resumes of applicants who are actually not available have to be evaluated, but— as Riach and Rich [1995, 347] have put it—these costs are "... in a manner which is not infrequent in the labor market, as participants carry out the process of search and acquisition of bargaining chips to negotiate with current and prospective employers." For a more exhaustive discussion on the ethical question of deception in social research see Riach and Rich [1991-92] and Goode [1996].
26. The result could also be interpreted in terms of a decomposition analysis. From the total differential between the feminine female and the male (14.53 percent), a small and insignificant part (5.13 percent) is due to personality, while the main effect is due to discrimination (9.40 percent).
27. These numbers take into account not only the sex specific formulation of the job title in the advertisement but also rather rare implicit signals for a desired applicant's sex. For example, having to be "very attractive and good-looking" was classified as implicitly searching for a female applicant, advertising sex-neutral but adding "looking for males with practical skills", on the other hand, was coded as masculine formulation. This classification follows Szabo [1990].
28. Often employers and opponents of a German sex-neutral language argue that the male form of a job term does not intend to exclude women, but is rather a historically grown general term including "all people".
29. As the positive coefficient for "job-term male" in column 2 (male - feminine female) suggests, a male job-term works equally strongly in favor of the male compared to the feminine female, a "job-term female" in column 1 and 2 works against him, no matter whether he competes against a feminine or masculine female (column 1).
30. This reminds one of the results for network technicians in Table 5 where we have found that masculinity slightly reduces the level of significance of differential treatment.

REFERENCES

- Altonji, J. G. and Blank, R. M.** Race and Gender in the Labor Market, in *Handbook of Labor Economics*, Volume 3C, edited by O. Ashenfelter and D. Card, New York: Elsevier, 1999, 3143-3259.
- Arrow, K. J.** The Theory of Discrimination, in *Discrimination in Labor Markets*, edited by O. Ashenfelter and A. Rees. Princeton: Princeton University Press, 1973, 3-33.
- Averett, S. and Korenman, S.** The Economic Reality of the Beauty Myth. *Journal of Human Resources*, Spring 1996, 304-330.
- Becker, G. S.** *The Economics of Discrimination*. Chicago: University of Chicago Press, 1957.
- Bem, S. L.** The Measurement of Psychological Androgyny. *Journal of Consulting and Clinical Psychology*, April 1974, 155-62.
- Biddle, J. E. and Hamermesh, D. S.** Beauty, Productivity, and Discrimination: Lawyers' Looks and Lucre. *Journal of Labor Economics*, January 1998, 172-201.
- Blinder, A. S.** Wage Discrimination: Reduced Form and Structural Estimates. *Journal of Human Resources*, Fall 1973, 436-55.
- Bovenkerk, F.** *Testing Discrimination in Natural Experiments. A Manual for International Comparative Research on Discrimination on the Grounds of "Race" and Ethnic Origin*. Geneva: International Labor Organisation, 1992.
- Butler, J.** *Gender Trouble: Feminism and the Subversion of Identity*. New York: Routledge, 1990.
- Case, M. A.** Disaggregating Gender from Sex and Sexual Orientation: The Effeminate Man in the Law and Feminist Jurisprudence. *Yale Law Journal*, 1995, 1-105.
- Cash, T., Gillen, B., and Burns, S. D.** Sexism and "Beautyism" in Personnel Consultant Decision Making. *Journal of Applied Psychology*, June 1977, 301 - 310.
- Chiplin, B. and Sloane, P. J.** *Sex Discrimination in the Labor Market*. London: Macmillan Press, 1976.
- Cohen, S. L. and Bunker, K. A.** Subtle Effects of Sex Role Stereotypes on Recruiters' Hiring Decisions. *Journal of Applied Psychology*, October 1975, 566-72.
- Cross, H., Kenney, G., Mell, J. and Zimmermann, W.** *Employer Hiring Practices: Differential Treatment of Hispanic and Anglo Job Seekers*. Washington DC: Urban Institute Press, 1990.
- Dekker, R. and van de Pol, L.** *Frauen in Männerkleidern. Weibliche Transvestiten und ihre Geschichte*. Berlin: Wagenbach, 1990.
- Devlin, A. S.** Architects: Gender-Role and Hiring Decisions. *Psychological Reports*, October 1997, 667-76.
- Dipboye, R. L. and Wiley, J. W.** Reactions of College Recruiters to Interviewee Sex and Self-Presentation Style. *Journal of Vocational Behavior*, February 1977, 1-12.
- Ehrenberg, R. G. and Smith, R. S.** *Modern Labor Economics: Theory and Public Policy*. New York: Harper Collins College Publishers, 1994.
- Fidell, L. S.** Empirical Verification of Sex Discrimination in Hiring Practices in Psychology. *American Psychologist*, December 1970, 1094-1098.
- Firth, M.** Racial Discrimination in the British Labor Market. *Industrial and Labor Relations Review*, January 1981, 265-72.
- _____. Sex Discrimination in Job Opportunities for Women. *Sex Roles*, 1982, 891-901.
- Fiske, S.T., Bersoff, D. N., Borgida, E., Deaux, K. and Heilman, M. E.** Social Science Research on Trial: The Use of Sex Stereotyping Research in Price Waterhouse vs. Hopkins. *American Psychologist*, October 1991, 1049-1060.
- Gerdes, E. P. and Garber, D. M.** Sex Bias in Hiring: Effects of Job Demands and Applicant Competence. *Sex Roles*, March 1983, 307-319.
- Glick, P., Zion C. and Nelson, C.** What Mediates Sex Discrimination in Hiring Decisions. *Journal of Personality and Social Psychology*, August 1988, 178-86.
- Goldberg, P.** Are Women Prejudiced Against Women? *Transaction*, 1968, 28-30.
- Goode, E.** The Ethics of Deception in Social Research: A Case Study. *Qualitative Sociology*, 1996, 11-33.
- Griffin, J. H.** *Black Like Me*. New York: Signet Book, 1996.
- Hamermesh, D. S. and Biddle, J. E.** Beauty and the Labor Market. *American Economic Review*, December 1994, 1174-94.
- Heckman, J. J.** Detecting Discrimination. *Journal of Economic Perspectives*, Spring 1993, 101-116.
- Heilman, M. E.** Sex Bias in Work Settings: The Lack of Fit Model. *Research in Organizational Behavior*, 1983, 269-98.
- _____. Information as a Deterrent Against Sex Discrimination: The Effects of Applicant Sex and Information Type on Preliminary Employment Decisions. *Organizational Behavior and Human Performance*, April 1984, 174-86.
- _____. Sex Stereotypes and Their Effects in the Workplace. *Journal of Social Behavior and Personality*, 1995, 3-26.
- Heilman, M. E. and Saruwatari, L. R.** When Beauty Is Beastly: The Effects of Appearance and Sex on Evaluations of Job Applicants for Managerial and Nonmanagerial Jobs. *Organizational Behavior and Human Performance*, June 1979, 360-372.
- Kenney, G. M. and Wissoker, D. A.** An Analysis of the Correlates of Discrimination Facing Young Hispanic Job-Seekers. *American Economic Review*, June 1994, 674-83.
- Laner, M. R. and Laner, R. H.** Sexual Preference or Personal Style? Why Lesbians Are Disliked. *Journal of Homosexuality*, Summer 1980, 339-56.
- Levinson, R. M.** Sex Discrimination and Employment Practices: An Experiment with Unconventional Job Inquiries. *Social Problems*, April 1975, 533-43.
- Marlowe, C. M., Schneider, S. L., and Nelson, C. E.** Gender and Attractiveness Biases in Hiring Decisions: Are More Experienced Managers Less Biased? *Journal of Applied Psychology*, February 1996, 11-21.
- McCreary, D. R.** The Male Role and Avoiding Femininity. *Sex Roles*, November 1994, 517-22.
- Neumark, D., Bank, R. J., and Van Nort, K. D.** Sex Discrimination in Restaurant Hiring: An Audit Study. *Quarterly Journal of Economics*, August 1996, 915-41.

- Newman, J. M.** Discrimination in Recruitment: An Empirical Analysis. *Industrial and Labor Relations Review*, October 1978, 15-23.
- Oaxaca, R.** Male-Female Wage Differentials in Urban Labor Markets. *International Economic Review*, October 1973, 693-709.
- Olian, J. D., Schwab, D. P., and Haberfeld, Y.** The Impact of Applicant Gender Compared to Qualifications on Hiring Recommendations. *Organizational Behavior and Human Decision Processes*, April 1988, 180-195.
- Osterreichisches Statistisches Zentralamt, Volkszählung 1991.* Wien: Osterreichische Staatsdruckerei, 1993.
- Phelps, E. S.** The Statistical Theory of Racism and Sexism. *American Economic Review*, September 1972, 659-661.
- Riach, P. A. and Rich, J.** Measuring Discrimination by Direct Experimental Methods: Seeking Gunsmoke. *Journal of Post Keynesian Economics*, Winter 1991-1992, 143-50.
- _____. Testing for Racial Discrimination in the Labor Market. *Cambridge Journal of Economics*, September 1991, 239-59.
- _____. An Investigation of Gender Discrimination in Labor Hiring. *Eastern Economic Journal*, Summer 1995, 343-56.
- Riehle, D.** *Personalbeurteilung vor dem Hintergrund sozialer Kategorisierungsprozesse.* Lengerich: Pabst Science Publishers, 1996.
- Rosen, B. and Jerdee, T. H.** Influence of Sex Role Stereotypes on Personnel Decisions. *Journal of Applied Psychology*, February 1974, 9-14.
- Schein, V. E.** The Relationship Between Sex Role Stereotypes and Requisite Management Characteristics. *Journal of Applied Psychology*, 1973, 95-100.
- Swim, J., Borgida, E., and Maruyama, G.** Joan McKay Versus John McKay: Do Gender Stereotypes Bias Evaluations? *Psychological Bulletin*, May 1989, 409-429.
- Szabo, E.** *Sexistische Codes in Stellenanzeigen. Veränderungen der sozialen Repräsentation weiblicher und männlicher Stelleneignung zwischen 1968 und 1988,* master thesis, University of Linz, 1990.
- Turner, M., Fix, M., and Struyk, R.** *Opportunities Denied, Opportunities Diminished: Discrimination in Hiring.* Washington DC: The Urban Institute Press, 1991.
- Ussher, J. M.** *Fantasies of Femininity. Reframing the Boundaries of Sex.* New Jersey: Rutgers University Press, 1997.
- Van Vianen, A. E. and Willemsen, T. M.** The Employment Interview: The Role of Sex Stereotypes in the Evaluation of Male and Female Job Applicants in the Netherlands. *Journal of Applied Social Psychology*, March 1992, 471-91.
- Wallraff, G.** *Ganz Unten.* Koeln: Kiepenheuer u.W, 1988.
- Weichselbaumer, D.** Sally and Peppermint Patty Looking for a Job. Geschlechtsspezifische Diskriminierung am Arbeitsmarkt. *Linzer Schriften zur Frauenforschung*, 1999, 67-105.
- Wheelwright, J.** *Amazons and Military Maids: Women Who Dressed as Men in Pursuit of Life, Liberty and Happiness.* London: Pandora, 1990.
- Wootton, B. H.** Gender Differences in Occupational Employment. *Monthly Labor Review*, April 1997, 15-24.
- Yinger, J.** Measuring Racial Discrimination with Fair Housing Audits: Caught in the Act. *American Economic Review*, December 1986, 881-93.