

Do Gender Differences in Preferences for Competition Matter for Occupational Expectations? ¹

Forthcoming, Journal of Economic Psychology

Kristin J. Kleinjans

February 2009

Abstract

Occupational segregation by gender is prevalent and can explain some of the gender wage gap. I empirically investigate a possible explanation for this segregation: the gender difference in preferences for competition, which in recent experimental studies has been found to affect economic outcomes. My findings suggest that women's greater distaste for competition decreases educational achievement. It can also explain part of the gender segregation in occupational fields. Specifically, accounting for distaste for competition seems to reduce gender segregation in the fields of Law, Business & Management, Health, and Education.

JEL Codes: D84, J24, J16, I21

PsycINFO Code: 2970

Key words: competition, gender differences, occupational choice, expectations

¹ Kristin J. Kleinjans, University of Aarhus, presently at University of Southern California and RAND. Email: kleinjan@usc.edu, Phone: +1-424-645-4685. I would like to thank two anonymous referees for valuable comments, Maria Knoth Humlum for her assistance with the datasets, Karl Fritjof Rasmussen for excellent research assistance, and the Danish Research Agency for funding. Thanks also to Mette Verner, participants at the 2007 CIM-AKF Workshop in Nyborg (Denmark), the 2008 SOLE meetings, the 2008 Nordic Summer Institute in Labour Economics, and seminar participants at the Rady School at UC San Diego, UC Riverside, Loyola Marymount, and Cal State Fullerton for helpful discussions.

1. Introduction

Occupational segregation by gender is prevalent in most if not all countries (Anker 1998). Women and men work in different fields and within fields at different levels. In college, for example, women choose different subjects than men, and if they study the same field they enter different types of occupations (Shauman 2006). Although this segregation has decreased in the 1990's in the US (Hellerstein et al. 2007), it is still significant and can explain part of the continuing gender wage gap (Bayard et al. 2003; Blau and Kahn 2007).² The wage gap has shrunk but not disappeared, despite the fact that women's educational attainment has caught up to and in some countries, such as the US, even surpassed that of men (Blau and Kahn 2000; Goldin 2006; Goldin et al. 2006).

Several non-mutually exclusive explanations for occupational segregation have been offered (see Anker 1998: Ch. 2 for an overview), ranging from different levels and types of human capital to discrimination by employers, women's primary role in rearing children, and social norms. Recent research points to a potential additional reason for differences in preferences: the gender difference in taste for competition.

According to recent experimental studies, women and men exhibit not only different preferences for competition but also different behavior in competitive situations (for example, Niederle and Vesterlund 2007). Gender differences in taste for competition are significant and evidence suggests that they affect economic outcomes, including possibly career choices (Croson and Gneezy forthcoming; Babcock and Laschever 2003, Ch. 4). Since salaries increasingly contain elements of performance related pay (see Lemieux et al. forthcoming, for evidence for

² Other reasons include gender differences in work hours and experience, and discrimination (Blau and Kahn 2000).

the US), the effect of the gender differences in taste for competition on wages is likely to increase in the future.

In this paper, I investigate empirically whether gender difference in preferences for competition can explain some of the differences in career choices. Specifically, I am interested in the question whether gender differences in distaste for competition can explain occupational expectations of young adults, and thus part of expected occupational segregation. To address this question I use a unique data set from Denmark, which includes both administrative and survey data, with information on occupational expectations and distaste for competition of young adults, as well as on ability and socioeconomic background. As a measure of distaste for competition, I use the level of agreement to the statement whether “Outside the world of sports, people should compete as little as possible”. Using Danish data is also helpful in investigating gender differences in occupational choice because of its high female labor force participation and universal child care provisions.

My findings support the notion that, after controlling for ability and socioeconomic background, gender differences in distaste for competition can indeed explain some of the gender differences in occupational choice. A greater distaste for competition is related to a lower fraction of women expecting to work in an occupation requiring a college degree. It can also explain some of the expected gender segregation in three out of eight occupational fields.

These results suggest that preferences for competition affect economic outcomes not only in experimental settings, but also real life choices. This has not been explored before. The fact that some of the gender differences in occupational choice can be explained by differences in preferences for competition also points to the possible importance of differences in preferences for career outcomes, including gender differences in wages. Of course, it is unlikely that

preferences for competition are the main or even one of the most important factors in occupational choice. This is supported by the result that preferences for competition only affect the choice of three out of eight occupational fields. Nevertheless, distaste for competition can explain some of the differences in educational achievement and occupational choice.

The remainder of this paper is organized as follows. In the next section, I elaborate on the conceptual framework. Section 3 describes the empirical strategy. Section 4 describes the data and the variables used, and Sections 5 and 6 present and discuss the results. The final section concludes.

2. Conceptual Framework: Competition and Its Link to Occupational Choice

Recent experimental research finds that gender differences in preferences for competition affect economic outcomes. Gneezy et al. (2003) find that women underperform in competitive experimental environments relative to non-competitive ones. Niederle and Vesterlund (2007; see also Datta Gupta et al. 2005, and Örs et al. 2008) find that women “shy away from competition”, which results in lower payouts for women than men at same performance levels. The difference in choices can be explained by gender differences in taste for competition and the fact that men are more over-confident than women. The authors suggest that these results might help explain the low representation of women in top-level positions.

Explanations for the reasons behind the gender differences in preferences for competition vary. Sociologists and psychologists argue that overtly competitive or aggressive behavior of girls and women leads to social sanctions from peers and society in general, while it is rewarded for boys and men (Valian 1999). It is also possible that girls anticipate inequality of opportunities

and see, therefore, less value in competing.³ Conversely, in the perspective of evolutionary psychology, gender roles have their roots in evolutionary pressures. As primary caretakers of children, women receive lower benefits from competition than men since competition can result in bodily injury, which is potentially harmful to their offspring. Notable exceptions are two specific types of competition: competition for mates and for the well being of their offspring (Deaner 2006; Campbell 2002).⁴ The hypothesis that preferences for competition are not caused by innate gender differences but result at least in part from learned behavior is supported by Gneezy et al. (forthcoming), who find that in an experimental environment women in a matrilinear society are more likely to select into competitive environments than men, while in a patriarchal society it is just the opposite.

The experimental findings suggest that preferences for competition might explain some of the observed gender differences in economic outcomes, with potential implications for public policies aimed at reducing such gaps. Occupational choice is a good candidate for such a study since occupations have different competitive environments, and competition plays an important role for getting into and completing an education.

The measure of competition used in this paper is very general. This is not an important restriction since the subject of interest is the general attitude towards competition and how this influences occupational choice. The possible ways through which this influence might take place are numerous, and include competition for entrance into educations, job openings, promotions, and salary increases. In the following, I assume that individuals with a stronger distaste for competition are more likely to choose less competitive occupations.

³ I thank an anonymous reviewer for pointing this out.

⁴ In this paper, the focus is the general attitude towards competition not these exceptions.

Introducing preferences for competition in a theoretical model is straightforward. Consider the standard economic approach to occupational choice, the theory of human capital, where individuals choose the occupation (or education) that maximizes expected utility (Becker 1964; Boskin 1974). Benefits and costs of an occupation can be pecuniary and nonpecuniary and depend on individual characteristics. In the context of these models, preferences for competition can be interpreted as influencing occupational expectation directly or through its impact on other non-pecuniary payoffs such as expected job satisfaction. In this paper, I estimate reduced-form models of occupational choice, with preferences for competition, attitudes towards work, ability, and socioeconomic background as explanatory variables. These are intended to capture costs and benefits of an occupation. I then explore whether the gender differences in preferences for competition can explain some of the observed segregation in occupational expectations.

I use occupational expectations as a proxy for occupational choice. Much of peoples' preferences and tastes are formed in early childhood, while occupational aspirations change considerably during childhood (Gottfredson 1981, Valian 1999). The analysis that follows assumes that preferences are indeed formed prior to occupational expectations. Expectations of teenagers and young adults are predictive for actual outcomes (Fischhoff et al. 2000). Although there is some controversy about how strongly occupational expectations are related to actual outcomes, there is evidence that they are strong predictors of later career attainment of professionals (Schoon 2001) and that gender differences in career aspirations can explain some of the observed differences in occupational outcomes (Harper and Haq 2001).

3. Empirical Strategy

To assess whether differences in taste for competition can explain gender differences in occupational expectations, I conduct two different sets of analysis for women: one for the level of education required for the expected occupation and one for its field. I then compare women's predicted probabilities under different assumptions of preferences for competition to men's distribution in order to assess the effect of gender differences in preferences for competition on occupational segregation.

For the outcome of the required level of education, I estimate the following generalized ordered logit model of chosen educational level:⁵

$$P(L_i > j) = \exp(\alpha_j + X_i\beta_j) / 1 + \exp(\alpha_j + X_i\beta_j),$$

where $j = 1, 2$ is the ordered required educational level (highest category omitted); L_i is the educational level required for the expected occupation of individual i , α_j is a constant term, and X_i the vector of independent variables (which includes dummies for distaste for competition with the highest agreement omitted). Parameters are allowed to vary across thresholds for educational levels when statistical tests reject the null of equality at the 5% level;⁶ equality is imposed otherwise. The control variables include measures of ability as well as of socioeconomic background and attitudes towards work.

To assess the impact and importance of women's different distaste for competition for expectations of occupational field, I conduct a multinomial logit analysis for eight occupational

⁵ Long and Freese 2006: 187f.

⁶ This implies that for these variables, the parallel regression assumption is violated. The model used here is also called a partial proportional odds model (Williams 2006).

fields, including the same explanatory variables as before. Note that because of the small sample size, occupational fields are defined broadly. Therefore, the results should be interpreted qualitatively and not quantitatively, and are only suggestive of the effects of preferences for competition on occupational choice.

To control for ability is crucial since ability influences occupational choice through its effects on cost of effort and expected success in an occupation. The measures of ability used are a reading test score and self-concepts of mathematical and general academic ability. Self-rated measures are highly correlated with grades in related courses (Gottfredson 1981) and are also useful because one's own beliefs might be a stronger basis for occupational choice than objective measures.⁷ Controlling for socioeconomic background is important since it reflects potential financial constraints as well as different home environments. In addition, measures about the importance of work vs. family and spare time as well as the separation of work and spare time through friendship with colleagues are included in the analysis (these will be called "attitudes towards work" in what follows). This is to control for the possibility of the correlation of preferences for competition with the importance of one's work and for potentially different benefits from one's colleagues in more or less competitive occupations.

There are two potential concerns with this type of analysis: first, the impact of fertility expectations on occupational choice; and second, the possibility of omitted variable bias. Although there is no direct way of addressing the concern about fertility expectations, evidence

⁷ There is no measure of over-confidence available in the data, which Niederle and Vesterlund (2007) found to be an important and gender differentiated influence on choices between different competitive schemes. It is likely, though, that the self-concepts reflect at least some of these differences. The inclusion of a measure of self-confidence did not alter the results.

presented below suggests that it is not an important confounder of the results. Likewise, I argue below that omitted variable bias or reverse causation is not of primary concern, either.

Fertility expectations might influence occupational choice through their effect on expected labor force attachment, work hours, and importance of family friendliness such as flexible work schedules (Polachek 1981). Distaste for competition is correlated with fertility expectations if, for example, occupations with flatter earnings profiles (which punish time out of the labor force less) are less competitive. If fertility expectations and distaste for competition are correlated, its effects might be wrongly attributed to distaste for competition. Although there is no direct measure of fertility expectations available in the data, some variables can serve as proxies (such as preferences for job characteristics). Robustness checks of all estimations, which included these proxy variables, found no important differences in the results. This may be explained by the fact that the empirical analysis uses data from Denmark. Denmark has one of the highest labor force participation rates of women in the OECD countries, and the gender difference in labor force participation is small – the percentages of women and men who work or are under education are within a few percentage points of each other (at about 80%). Contrary to other countries, the share of women working part-time is also relatively small: 15% of working women versus 10% of working men.⁸ At the same time, maternal leave provisions and childcare are universal (Pylkkänen and Smith 2003). It is thus less likely than in other countries that women choose different occupations than men because of a different attachment to the labor force.

⁸ Own calculations for population age 16-66, using 2005 data from Statistics Denmark. Part-time is defined as working less than 27 hours a week.

Nevertheless it is possible that women's preferences for children (or fertility expectations) and for competition are correlated. If women with lower fertility expectations have stronger preferences for competition, the magnitude of the effect of preferences for competition on occupational choice are biased upwards. However, most women in Denmark have children. The average number of children per women was 1.8 and only 12.7% of women age 49 had no children in 2005.⁹ Combined with the fact that the proxy variables for fertility expectations do not alter the results, this upward bias is likely to be small.

The second concern regards possible omitted variable bias. This implies that caution may be advised when interpreting the coefficients on distaste for competition as causal since it is possible that other, unobserved factors drive both distaste for competition and occupational expectations. Possible candidates for such factors, for which I control, are ability and socioeconomic background. More problematic is the possibility that women have lower self-confidence and are more risk averse than men (Powell and Ansic 1997; Niederle and Yestrumskas 2008), both of which could be correlated with preferences for competition and occupational choice. However, including a measure of self-confidence in the estimation did not alter the outcome.¹⁰ Unfortunately, there is no measure of risk aversion in the data. Since previous studies have found gender differences in preferences for competition (including differences of willingness to compete depending on the gender of the competition, see Niederle et al. 2008) and provide potential reasons for these differences, the answers to the question about distaste for competition are likely to measure at least some of these attitudes. There is also recent

⁹ According to Statistics Denmark.

¹⁰ Self-confidence is measured as the level of agreement with this statement about feelings when thinking about the future: "You are sure you can handle it".

evidence by Örs et al. (2008) that differences in risk aversion cannot explain the performance gender-gap in competitive entrance exams for admission to a masters program in France.

4. Data

The data used in this study is called PISA-L and combines three different data sets from Denmark. The PISA data contains information from children who participated in the 2000 OECD Programme for International Student Assessment (PISA) of nationally representative ninth graders. This data provides the measures of ability used as well as information on the number of siblings and birth order.¹¹ The second data source is a 2004 follow-up survey of these (then 19 years old) PISA respondents entitled “Young people in job or education: Values, choices, and dreams for the future”, from which the survey measures about expected occupation, attitudes toward competition and the importance of work and job characteristics are obtained (for more information on PISA-L, see Jensen and Andersen 2006). Parental income and education information is drawn from administrative records for the year 1998. This data set combines the advantages of administrative data (low measurement error of family background) and survey data (subjective information) and includes both objective and subjective ability measures.

Of the 3,084 observations in PISA-L, 772 were dropped because important information was missing. Most of these (509) were dropped because of missing or unclassifiable answers to the question about occupational expectations. The resulting sample of 2,312 observations (1,181 women and 1,131 men) is slightly positively selected in terms of parental background and ability, probably reflecting the fact that children from higher socioeconomic backgrounds and of

¹¹ For more information on PISA see OECD (2002).

higher ability are more likely to have formed concrete expectations for the future. As mentioned earlier, since women are the main interest, the analyses are conducted for the women in the sample, and men's preferences and expectations are used as a comparison.

The main outcome variable, occupational expectation, is derived from the answer to the following question: "*What kind of job do you think you will have when you are around 30 years old?*" The answer to this open question is used to derive two variables: First, the educational level required for this occupation; and second, the field of this occupation.¹² In a few cases (50), the required educational level needed is not determinable, and in these cases the answers to other questions about planned, current, and completed education were used.¹³

TABLES 1 AND 2 ABOUT HERE

In accordance with the Danish educational system I distinguish three educational levels required for the expected occupation: Vocational training or less, short- or medium-cycle education, and college or more.¹⁴ Table 1 shows the percentages of respondents by gender in the different educational levels. Women are much more likely than men to expect to work in an

¹² The US Standard Occupational Classification from the Bureau of Labor Statistics was used as a guidance. See http://bls.gov/soc/soc_majo for more information on the classification.

¹³ Excluding these observations from the estimations did not alter the results.

¹⁴ Short-cycle education is typically a further training for individuals with completed vocational training and leads to qualifications such as laboratory technician. Medium-cycle education typically requires a high school degree and leads to qualifications such as librarian. Some types of specialized high school degrees, which enable graduates to immediately work in a certain occupation, are classified as vocational training.

occupation requiring short or medium level education instead of vocational training or less, and less likely in one requiring a college degree.¹⁵

The expected occupation is classified into eight fields: Law, Business & Management; Sciences & Engineering; Education; Architecture, Design & Media; Health; Services & Clerical; Protection; and Skilled Trades. Table 2 provides an overview of the gender distribution of fields and the biggest occupational groups in each category. Women are much less likely to expect to work in Skilled Trades and much more in Education and Health.

The attitude towards competition is derived from a question about the level of agreement with the following statement expressing distaste for competition: “*Outside the world of sports, people should compete as little as possible.*” The respondent could indicate agreement on a scale from one (completely disagree) to five (completely agree). Table 3 shows the distribution of answers by gender. More women than men agree with this statement and less disagree. The biggest gender difference is at “completely disagree” – over 10%-points more men than women chose this answer. To assess in how much the wording of the statement affects the answers (both with respect to the mentioning of sports and the possible difference between “people” and own behavior) I gave two classes of Danish High School students of the same age group the same statement, preceded by this one: “In my life, I compete as little as possible”. 86% of the answers were within one level of agreement.¹⁶

¹⁵ This is in line with what can be observed in the Danish population. According to Statistics Denmark, among those aged 35-39 years in 2005, more men than women have a masters degree or higher, and more men have vocational training or less. Women are more likely than men to have a medium and short term education. (In this age group, very few have a bachelor, a degree which only recently had been introduced.)

¹⁶ Thanks to Anette Lind and Conni Paldam for giving me access to these students.

TABLE 3 ABOUT HERE

Additional variables used in the analyses include information on socioeconomic background (dummies for the educational level of each parent and log of income by parent), ability measures, and measures of attitudes towards work. The three ability measures used warrant some further explanation. The first measure is a summary reading literacy test score.¹⁷ The two other ability measures are the level of agreement with the statements: 1) “I’m good at most school subjects”, and 2) “I get good marks in mathematics”. These two measures were converted into 0/1 dummies. Women have higher reading scores and are less likely to report high self-concepts in general academics and math. Attitudes towards work are measured as the level of agreement with two statements: first, about the importance of work vs. family and spare time (“For you, family and spare time will always take priority; work will have to fit in”); and second, about the separation of work and spare time (“Most of your friends will probably be people you meet through work”). These two measures are included as separate dummies for each level of agreement.

For the robustness checks of whether fertility expectations change the influence of distaste for competition on occupational choice, two sets of variables are used: Sibling information (number of siblings and/ or whether the respondent is an only or oldest child), and preferences for job characteristics. The latter are two dummy variables derived from the question about what is considered more important for a job: 1) shorter/ convenient work hours or 2) job safety (omitted categories: “that it is challenging” and “don’t know”).

¹⁷ This variable, called “wleread”, is a standardized (weighted likelihood) Warm estimate that is provided by the OECD within the PISA data set.

To investigate whether gender differences in preferences for competition persist when controlling for ability and socioeconomic background, I conducted an ordered logit regression of distaste for competition, allowing for differences of parameters across thresholds (see Table A1 in the appendix for selected odds ratios).¹⁸ As in the simple cross-tabulations, women are much more likely than men to agree with the statement about distaste for competition. These differences are statistically different and greater at lower levels of agreement. Higher income of the father and distaste for competition are negatively related, which is also the case for ability and distaste for competition.

5. The Effect of Distaste for Competition on Expected Level of Education

To see whether women's stronger distaste for competition affects their expected level of education, I estimated the partial proportional odds model presented in Section 3 for women's required education level. The results show strong effects of distaste for competition on educational level. Table 6 shows the odds ratios for the distaste for competition dummies.¹⁹ There is a clear relationship between distaste for competition and required educational level – higher distaste for competition is strongly and statistically significantly related to a lower education level. For example, the odds of choosing an education requiring a college degree

¹⁸ To investigate whether those with the level of agreement of “both agree and disagree” are similar to those who answered “don't know” (see, for example, Lillard and Willis, 2001), I conducted a multinomial logit estimation as comparison (results omitted), but found little evidence that this might be the case.

¹⁹ A note on the interpretation: the odds ratio is defined as the odds of choosing an occupation requiring a higher educational level versus the odds of choosing a lower one.

versus less education for a woman who completely agrees with the statement are only 41.3% of the odds of a woman who completely disagrees.²⁰

The other covariates show the expected effects. For example, higher ability and higher parental education are correlated with a higher implied educational level (results not shown).

TABLES 6 AND 7 ABOUT HERE

An easier way to interpret the result is to compare predicted probabilities of educational levels for women with different distastes for competition (shown in Table 7). To hold other differences between men and women constant, consider the predicted probabilities of an average woman and compare these with the predicted probabilities of an average woman with men's average distaste for competition (shown in the first two rows of Table 7). The predicted probabilities of each educational level are statistically different – women with men's average distaste are more likely to choose an occupation requiring more education. This effect becomes stronger if we consider another counterfactual – what if an average woman, instead of “completely agree” would “both agree and disagree” with the statement about competition? As in the former case, women would be much more likely to choose a longer education.

To assess the importance of this change, consider the case where all women with the highest distaste for competition (which are 17.7% of all women) were to change to “both agree and disagree”. In the case of this counterfactual, we would observe 39% more of them to expect to get a college degree. This would imply 6.9%-points more women in college, an increase of 18.9%.

²⁰ A robustness check of excluding individuals who answered “don't know” to the competition question did not affect the results.

Although distaste for competition influences educational level, it is noteworthy that in the counterfactuals gender differences narrow in the longest educational level but further increase in the two lower ones, leading to an overall relative increase of women's education relative to men's.²¹ The remaining stark gender differences in the distribution in the lowest and short or medium educational level could be related to the fact that many occupations in Denmark that require vocational training are rather well paid and include possibilities of advancement through either further training or the opportunity of opening up a small (and lucrative) business in the field. Many of these occupations are male-dominated (such as electrician or carpenter). For women, occupations that might be considered comparable require a short or medium term education, such as, for example, nurse or midwife.

6. The Effect of Preferences for Competition on Expected Occupational Field

The previous section showed that gender differences in distaste for competition can explain some of the observed gender differences in educational attainment. Whether distaste for competition can also help explain why women and men choose different occupational fields is evaluated in this section. Table 8 reports the relative risk ratios resulting from a multinomial logit regression of women's expected occupational field for the main variables of interest, the dummies for distaste for competition (the same set of independent variables as before is included).

Compared to choosing the base category, Law, Business & Administration, women who dislike competition are generally more likely to choose any other field except Architecture, Design & Media. The differences are strongest for those who dislike competition the most. Note

²¹ This implies that if men's and women's preferences for competition were the same, women's educational attainment might be even higher relative to men's (Goldin 2006).

that although the relative risk ratio for “completely agree” in the field Protection is very high, that the number of women in this category is also very small.²²

As mentioned earlier, no assumptions are made about which occupational fields are more competitive than others, nor it is necessary to specify what competitiveness of a field might exactly mean. Nevertheless, one can deduct from the regression results the fields that are more likely to be chosen by people who have a lesser distaste for competition: Law, Business & Management and Architecture, Design & Media. One reason why Law, Business & Management attracts people who dislike competition less could be that this field is more risky than the others in terms of wage dispersion, resulting in more competition for better paid positions.²³ Although the field of Architecture, Design & Media is not very risky by this definition, occupations in this field require educations that are difficult to be accepted into, especially those in design.

TABLES 8 AND 9 ABOUT HERE

Relative risk ratios are not very intuitive, so – as before – predicted probabilities help interpret the results and the size of the effects. Table 9 shows the predicted probabilities of expecting to work in each of the fields. Column 1 and 2 show the predicted probabilities for an average woman and an average woman with men’s average distaste for competition for each of the eight fields. In four of the fields these predicted probabilities are statistically different. More

²² Excluding women who chose the field Protection or those who answered “don’t know” to the statement about competition did not alter the results.

²³ Risk is measured as the standard deviation divided by the mean wage of the main occupations, calculated using a 10% sample of the Danish population. For example, for legal occupations, this ratio is 0.67 compared to 0.18 for pedagogues. Similar results for Denmark have been found by Christiansen et al. (2007). I thank Anna Piil Dam for this connection.

women are predicted to choose Architecture, Design & Media as well as Law, Business & Management, and less to choose Education and Health. These differences are substantial - the predicted probabilities for these four fields differ between 4.2% and 9.2% from the probability of an average woman.

These findings suggest that in three of these four fields where changing distaste for competition produces statistically different predicted probabilities, expected gender segregation decreases when women's distaste for competition is lowered. The exception is Architecture, Design, and Media. The overall effect of a lesser distaste for competition, however, is a decrease in gender segregation.

Half of the occupational fields considered are not influenced by distaste for competition: Sciences & Engineering, Services & Clerical, and two fields with a small percentage of women, Protection and Skilled Trades. As mentioned earlier, it is unlikely that preferences for competition are a main determinant of occupational choice. Why these fields are not affected by preferences for competition remains for future study.

7. Conclusions

In this paper, I empirically investigate whether gender differences in taste for competition can explain occupational choice and hence part of the observed occupational segregation by gender. In experimental settings, women have been found to be less competitive than men. This causes women to underperform in competitive environments and to make compensation choices that result in lower pay – if given the choice, women choose less competitive rates over higher paying competitive rates.

Consistent with former findings, I find that women have a greater distaste for competition than men. The median woman both agrees and disagrees with the statement that “Outside the world of sports, people should compete as little as possible”, while the median man partly disagrees. This is confirmed by the results of a multivariate analyses controlling for ability and family background.

I investigate the effect of these gender differences in distaste for competition by estimating two separate models for women, one for the required educational level of the occupation that the respondent expects to have when she is 30 years old, and one for the occupational field of this occupation, in each controlling for ability and family background characteristics. The findings suggest in both cases that distaste for competition affects occupational choice. Women’s stronger distaste for competition seems to decrease their educational attainment relative to that of men and increase expected occupational segregation by field.

Specifically, with respect to the level of education required for the expected occupation, I find that the predicted probabilities of women who expect to go to college increase by 4.7% if an average woman is given men’s mean distaste for competition instead of women’s mean. This would almost close the gap between the percentage of men and women who expect to go to college, and further increase the relative number of men with the lowest educational attainment compared to women. Using a multinomial logit model relating distaste for competition to the expected occupational field I find that women’s greater distaste for competition can explain some of the expected occupational segregation by field, and in particular in the fields of Law, Business, & Management, Education, and Health. In one field, Architecture, Design & Media segregation is actually lower than it would be if gender preferences for competition were the

same. Overall, though, segregation would be lower if preferences for competition were the same for women and men. Note that not all fields are affected by preferences for competition; gender segregation in these fields is likely to stem from other sources.

In summary, these results suggest that preferences for competition can explain part of occupational expectations, and through their link with occupational outcomes, also economic choices.

References

- Anker, R. (1998). *Gender and Jobs: Sex segregation of occupations around the world*. Geneva: International Labour Office.
- Babcock, L., & Laschever, S. (2003). *Women Don't Ask: Negotiation and the Gender Divide*. Princeton and Oxford: Princeton University Press.
- Bayard, K., Hellerstein, J., Neumark, D., & Troske, K. (2003). New Evidence on Sex Segregation and Sex Differences in Wages from Matched Employer-Employee Data. *Journal of Labor Economics*, 21(4), 887-922.
- Becker, G. S. (1964, expanded edition: 1993). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. Chicago: University of Chicago Press.
- Blau, F. D., & Kahn, L. M. (2007). The Gender Pay Gap. *The Economists' Voice*, 4(4), article 5.
- Blau, F. D., & Kahn, L. M. (2000). Gender Differences in Pay. *Journal of Economic Perspectives*, 14(4), 75-99.
- Boskin, M. J. (1974). A Conditional Logit Model of Occupational Choice. *Journal of Political Economy*, 82(2, Part 1), 389-398.

- Campbell, A. (2002). *A mind of her own: The evolutionary psychology of women*. New York: Oxford University Press.
- Christiansen, C., Joensen, J. S., Nielsen, H. S. (2007). The risk-return trade-off in human capital investment. *Labour Economics*, 14, 971-986.
- Croson, R., & Gneezy, U. (forthcoming). Gender Differences in Preferences. *Journal of Economic Literature*.
- Datta Gupta, N., Poulsen, A., & Villeval, M.-C. (2005). Male and Female Competitive Behavior: Experimental Evidence. *IZA Discussion Paper* 1833.
- Deaner, R. O. (2006). More males run fast: A stable sex difference in competitiveness in U. S. distance runners. *Evolution and Human Behavior* 27, 63-84.
- Fischhoff, B., Parker, A. M., Bruine de Bruin, W., Downs, J., Palmgren, C., Dawes, R., & Manski, C. F. (2000). Teen Expectations of Significant Life Events. *Public Opinion Quarterly*, 64, 189-205.
- Gneezy, U., Leonard, K. L., & List, J. A. (forthcoming). Gender Differences in Competition: Evidence from a matrilineal and a patriarchal society. *Econometrica*.
- Gneezy, U., Niederle, M., & Rustichini, A. (2003). Performance in Competitive Environments: Gender Differences. *Quarterly Journal of Economics*, 118(3), 1049-1074.
- Goldin, C. (2006). The Quiet Revolution that Transformed Women's Employment, Education, and Family (Richard T. Ely Lecture). *American Economic Review Papers and Proceedings*, 96(2), 1-21.
- Goldin, C., Katz, L. F., & Kuziemko, I. (2006). The Homecoming of American College Women: The Reversal of the College Gender Gap. *Journal of Economic Perspectives*, 20(4), 133-156.

- Gottfredson, L. S. (1981). Circumscription and Compromise: A developmental theory of occupational aspirations. *Journal of Counseling Psychology (Monograph)*, 28(6), 545-579.
- Harper, B., & Haq, M. (2001). Ambition, discrimination, and occupational attainment: a study of a British cohort. *Oxford Economic Papers*, 53, 695-720.
- Hellerstein, J., Neumark, D., & McInerney, M. (2007). Changes in Workplace Segregation in the United States between 1990 and 2000: Evidence from Matched Employer-Employee Data. *NBER Working Paper* 13080.
- Jensen, T. P., & Andersen, D. (2006). Participants in PISA 2000 – Four Years Later. In: Mejdning, J., & Roe, A. (eds.), *Northern Lights on PISA 2003 – a reflection from the Nordic countries*. Copenhagen: Nordic Council of Ministers.
- Lemieux, T., MacLeod, W. B., & Parent, D. (forthcoming). Performance Pay and Wage Inequality. *Quarterly Journal of Economics*.
- Lillard, Lee and Robert Willis (2001). Cognition and Wealth: The Importance of Probabilistic Thinking. *University of Michigan Retirement Research Center Working Paper* WP2001-001.
- Niederle, M., Segal, C., & Vesterlund, L. (2008). How costly is diversity? Affirmative action in light of gender differences in competitiveness. *NBER Working Paper* 13923.
- Niederle, M., & Vesterlund, L. (2007). Do Women Shy Away From Competition? Do Men Compete Too Much? *Quarterly Journal of Economics*, 122(3), 1067-1101.
- Niederle, M., & Yestrumskas, A. H. (2008). Gender differences in seeking challenges: The role of institutions. *NBER Working Paper* 13922.
- OECD (2002). *Manual for the PISA 2000 Database*. Paris: OECD.

- Örs, E., Palomino, F. & Peyrache, E. (2008). Performance Gender-Gap: Does Competition Matter? *Centre for Economic Policy Research Discussion Paper* No. 6892.
- Polachek, S. W. (1981). Occupational Self-Selection: A Human Capital Approach to Sex Differences in Occupational Structure. *The Review of Economics and Statistics* 63(1), 60-69.
- Powell, M., & D, Ansic (1997). Gender differences in risk behaviour in financial decision-making: An experimental analysis. *Journal of Economic Psychology* 18, 605-628.
- Pylkkänen, E., & Smith, N. (2003). Career Interruptions due to Parental Leave: A Comparative Study of Denmark and Sweden. Paris: *OECD Social, Employment and Migration Working Paper* DELSA/ELSA/WD/SEM(2003)1.
- Schoon, I. (2001). Teenage Job Aspirations and Career Attainment in Adulthood: A 17-year follow-up study of teenagers who aspired to become scientists, health professionals, or engineers. *International Journal of Behavioral Development*, 25(2), 124-132.
- Shauman, K. A. (2006). Occupational Sex segregation and the earnings of occupations: What causes the link among college-educated workers? *Social Science Research*, 35, 577-619.
- Valian, V. (1999). *Why So Slow? The Advancement of Women*. Cambridge: MIT Press.
- Williams, R. (2006). Generalized Ordered Logit/ Partial Proportional Odds Models for Ordinal Variables. *The Stata Journal* 6(1), 58-82.

Table 1: Required Educational Level of Expected Occupation by Gender

Educational Level	Women	Men
1 - Vocational or lower	25.74%***	44.03%
2 - Short or Medium	37.68%***	16.18%
3 - College or more	36.58% *	39.79%
Total	100.00%	100.00%
N	1,181	1,131

*** denotes a statistical difference from men's fraction at the 1% level, * at the 12% level.

Table 2: Occupational Field by Gender

Field	Largest Occupational Groups and % of total in Field	Women	Men
Law, Business & Management	Legal Occupations (13%)	13.04% *	15.38%
Sciences and Engineering	Engineers (29%)	10.41%***	22.90%
Education	Pedagogues in childcare and special education (49%)	17.53%***	5.31%
Architecture, Design & Media	Designers and interior decorators (24%)	12.70%***	9.20%
Health	Medical doctors (30%)	22.86%***	3.63%
Services and Clerical	Shop assistants (13%)	19.05%***	12.56%
Protection	Police officers (60%)	1.27%***	7.16%
Skilled Trades	Craftsmen in construction, such as masons (63%)	3.13%***	23.87%
Total		100.00%	100.00%
N		1,181	1,131

*** denotes a statistical difference from men's fraction at the 1% level, * at the 11% level.

Table 3: Distaste for Competition by Gender ^a

	Women	Men
Completely Disagree	16.17%***	27.14%
Partially Disagree	19.14% *	22.19%
Both agree and disagree	23.62%***	18.66%
Partially Agree	21.68%***	17.06%
Completely Agree	17.70%***	13.62%
Don't know	1.69%	1.33%
Total	100.00%	100.00%

^a Defined as the level of agreement with the statement: "Outside the world of sports, people should compete as little as possible."

*** denotes a statistical difference from men's fraction at the 1% level, * at the 10% level.

Table 6: Partial Proportional Odds Model of Required Educational Level – Women

	Odds Ratio
Distaste for Competition	
partially disagree	0.662* (-1.92)
both agree and disagree	0.660** (-2.07)
partially agree	0.531*** (-3.22)
completely agree	0.413*** (-4.26)
don't know	1.086 (0.14)
Ability measures	Yes
Socioeconomic background	Yes
Attitudes towards work	Yes

Robust Z-statistics in parentheses. Statistically significant at the *10% level, **5% level, and ***1% level. For some of the control variables the assumption of proportional odds is relaxed. N=1,181. Log Likelihood = -1,124.95, Wald Chi Square = 249.47.

Table 7: Predicted Probabilities for Level of Required Education

Type		Probability for Outcome Category		
		Vocational or Less	Short/Medium	College
Average	Woman	0.205	0.452	0.343
Average Woman	with men's average distaste for competition ^a	0.194***	0.447***	0.359***
Average Woman w/	distaste for competition "completely agree"	0.281	0.463	0.256
	distaste for competition "both" ¹	0.197**	0.449	0.355***

^a Statistically different compared to the number above at the **5% level and ***1% level.

Table 8: Multinomial Logit Model for Occupational Field – Women
(Relative Risk Ratios shown)

Field	Distaste for Competition			
	partially disagree	both agree and disagree	partially agree	completely agree
Sciences & Engineering	2.023* (1.79)	1.777 (1.42)	2.918** (2.53)	2.171* (1.68)
Education	1.829* (1.66)	2.798*** (2.84)	3.313*** (3.20)	3.132*** (2.85)
Architecture, Design & Media	1.153 (0.40)	1.383 (0.88)	1.371 (0.82)	1.169 (0.35)
Health	1.256 (0.66)	1.896* (1.89)	3.193*** (3.35)	3.412*** (3.30)
Services & Clerical	1.041 (0.11)	1.593 (1.35)	2.139** (2.11)	2.218** (2.09)
Protection	5.037 (1.21)	2.009 (0.48)	6.038 (1.47)	12.211** (2.07)
Skilled Trades	2.774 (1.64)	0.456 (-0.89)	3.571* (1.92)	3.257* (1.79)
Ability measures			yes	
Family background variables			yes	
Attitudes towards work			yes	

Robust Z-statistics in parentheses. Statistically significant at the * 10% level, ** 5% level, and *** 1% level. Base category: Law, Business & Management. A dummy variable for a "don't know" answer to the question about distaste for competition is also included. N= 1,181. Log Likelihood = -2,011.30, Wald Chi Square = 30,024.41. A Hausman test showed no evidence of a violation of the IIA assumption.

Table 9: Predicted Probabilities for Occupational Field

Field	(1)	(2)
	Average Woman w/ distaste for competition of an Average Woman	an Average Man ^a
Sciences and Engineering	0.101	0.101
Education	0.195	0.186**
Architecture, Design & Media	0.130	0.138**
Health	0.260	0.249**
Services & Clerical	0.180	0.180
Protection	0.000	0.000
Skilled Trades	0.004	0.004
Law, Business & Management	0.130	0.142***

^a Statistically different at the ** 5% level and *** 1% level compared to the column on the left.

Appendix

Table A 1: Partial Proportional Odds Model of Distaste for Competition
(Odds ratios shown)

	Distaste for Competition			
	> completely agree	> partially agree	> both agree and disagree	> partially agree
Female	1.854***	1.819***	1.469***	1.386***
	(5.90)	(6.83)	(4.27)	(2.80)
Log Income Father	0.827***	0.827***	0.827***	0.827***
	(-3.15)	(-3.15)	(-3.15)	(-3.15)
Reading Score	0.955	0.778***	0.833***	0.760***
	(-0.74)	(-4.69)	(-3.36)	(-4.19)

Also included: log income of the mother and dummies for father's and mother's education (none statistically significant), as well as additional ability measures (dummies for good at school, good at math). Robust Z-statistics are shown in parentheses. Statistically significant at the *10% level, **5% level, and ***1% level. For some of the variables the assumption of proportional odds is relaxed. N=2,277 since "don't know" answers are excluded. Log Likelihood = -5,560.06, Wald Chi Square = 196.63.