Is it who you are, where you work, or with whom you work that matter for earnings? Gender and peer effects among late nineteenth-century industrial workers

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While most studies of wage gaps focus on the characteristics of the worker, particularly human capital, characteristics of the firms are also important in determining wages. Inter-industry wage differentials are well known (Krueger & Summers 1988), but there are also inter-firm differences in wages (Brown and Medoff 1989, Oi and Idson 1999). This heterogeneity at the firm level may have important implications for workers as well as for the firms. Social interaction in the workplace may lead to differences in productivity and earnings for workers in different firms, and the effects of firm and co-worker characteristics may differ for men and women. In this paper we examine the effects of firm and peer characteristics on the earnings of cigarworkers in Sweden at the end of the nineteenth century.

It is not immediately clear why cigarmakers worked together in workshops. They did not use machinery, and there was no need for a central power source. Williamson (2002) has emphasized "asset specificity" in creating the need for firms. However, cigar firms had little machinery and cigarmakers had general rather than firm-specific skills.[1] Most workers were on piece-rates, so monitoring was less important and firms did not need to rely on job ladders to provide incentives. Centralized production may have been necessary to produce a standardized product (Szostak 1989), and employers may also have wanted to minimize theft of tobacco. Another possible reason for the firm is peer effects among workers.

Are individuals who work with more productive peers also more productive? Recent studies have shown the importance of co-workers for productivity in the contemporary labor market. While there are many studies of peer effects in schools (see Sacerdote 2011 for a review), only few studies examine peer effects in the workplace. The literature is as yet limited but growing. It is largely restricted to studies on productivity in quite specific settings, based on laboratory experiments (Falk & Ichino 2006) or real data from a single firm or occupation, commonly low-skill occupations where learning is limited and output is easily observable (Mas & Moretti 2009; Bandiera, Barankay & Rasul 2010; Kaur, Kremer & Mullainathan 2010, Park 2016). The extant literature is void of historical evidence. In this paper we assess the impact of the work environment on individual wages in the past when, unlike today, most work was low-skilled,

[1] As seen below, after controlling for experience in the occupation firm tenure has no effect on wages.

training was limited, and the learning period was short. Such peer effects could be due to joint production, peer pressure, or knowledge spillover.

Skill formation is particularly important for understanding gender wage gaps. During the nineteenth century European women had less formal schooling than men (Perrin 2015 Ch. 3). Women were also less likely to be apprenticed (Snell, 1985, Ch. 6). Among the cigarmakers studied here, women were less likely to be apprenticed than men. Given their lack of formal training, women would have needed to rely on informal training in order to acquire skills. Informal training, however, is difficult to measure. In this paper we look for evidence that skilled co-workers increased wages, which may have been the result of informal training.

In this paper we assess the relationship between the work environment and men's and women's wages in the past. Based on detailed information on all workers and firms in the Swedish tobacco industry we are able to construct a matched employer-employee data set covering cigarworkers that will allow us to study the effects of co-workers on wage. We begin by examining wage profiles while controlling for individual characteristics. We then add two levels of analysis that are related to the firm. First we control for firm effects using both firm characteristics and firm fixed effects. Then we explore the impact of social interaction at the workplace and whether co-worker quality was associated with higher individual wages.

Since we do not have random assignment to firms, our effects are correlational. Relationships between firm characteristics and wages could be the result of some firms hiring workers with better unmeasured characteristics. There was sorting according to measured characteristics, so it would not be surprising if sorting occurred on unmeasured characteristics as well. Correlations between wages and co-worker quality could be the result of workers choosing firms with workers of similar quality. We think that the opportunities for such selection were relatively limited, particularly for women, but worker choice could be one of the reasons for co-worker effects.

We find that firm characteristics mattered for wages, though not in exactly the same way as in current labor markets. Controlling for urban location, firm size had little effect on earnings. More profitable firms paid more to men, but not to women. While in most cases co-worker quality did not matter for earnings, we do find a gender-specific pattern. Women with little experience in the industry earned more if they worked with high-experienced women. Such a pattern is

consistent with informal training among women. Whatever the cause of the peer effects, they operated within but not across genders in the cigar workshops of late nineteenth-century Sweden.

Previous research and theoretical considerations

Contemporary studies find that firm characteristics affect earnings. Larger firms pay higher wages (Oi and Idson 1999). Brown and Medoff (1989) conclude that the firm size effect is not entirely due to sorting by worker quality; even controlling for individual fixed effects there is still a positive effect of firm size on wage. Firm size also affects the gender wage gap. Heinze and Wolf (2010) find that the gender wage gap decreases with firm size, but increases with firm market power.

The literature also finds a positive relationship between firm profitability and worker earnings (Blanchflower, Oswald, Sanfey 1996; Fakhfakh and FitzRoy 2004). Such rent-sharing contributes to the gender wage gap because women are more likely to work at lower-profit firms. Women may also receive lower wage premia when they do work for profitable firms, due to their lower bargaining power. Some studies find the same wage-profit elasticity for men and women (Navon and Tojerow 2013), while other studies find that women benefit less than men from firm profitability (Nekby 2003). Card, Cardoso, and Kline (2016) explore two reasons why the firms where women work would affect the gender gap; first, women may be less likely to be employed at high-wage firms, and second, women may benefit less than men from working at a high-wage firm because they have less bargaining power. They conclude that sorting across firms explains about 15 percent of the gender wage gap in Portugal, while women's smaller gains from working at high-wage firms explain about 5 percent of the wage gap.

Individuals also earn less when they work at plants with more female employees. Carrington and Troske (1998) find the both men and women earn lower wages in establishments whose workforce has a high percentage of women, and they also find that this wage penalty is greater for women than for men. Employee discrimination would imply that firms hiring women would have to pay men higher wages to compensate for the disutility of having female co-workers, which is not consistent with the fact that men earn less a firms hiring more women. On the other hand, employers with a taste for discrimination might be willing to hire more women if they can pay them less. Alternatively, Ostroff and Atwater (2003) have suggested that those who work

primarily with women are seen as less valuable employees than those who work with men and thus earn less.

The literature on current labor markets leads us to expect that larger and more profitable firms paid higher wages, and that men benefited more than women from firm profitability. We also expect that firms where a greater percentage of the workforce was female should pay lower wages to both men and women. In this paper we investigate whether the same patterns were evident among cigarmakers a century ago.

Empirical evidence on peer effects in the workplace is relatively limited. Mas and Moretti (2009) studied workers at a large supermarket and showed that workers' productivity increases when they work alongside more productive co-workers, arguably through social pressure. Controlled laboratory experiments (e.g., Falk & Ichino 2006) have revealed similar results through the same mechanism (see also Kaur, Kremer & Mullainathan 2010; Bandiera, Barankay & Rasul 2010). The evidence for peer effects in the workplace induced by knowledge spillover is, however, mixed with some studies finding support for them (Jackson & Bruegemann 2009; Azoulay, Graff Zivin & Wang 2010), and others not (Waldinger 2012). Studies documenting peer effects through social pressure have typically analyzed low-skill jobs and repetitive tasks, while those investigating knowledge spillover have analyzed teachers or scientists. The contexts covered in previous studies are quite particular and not necessarily representative. Only one study (Cornelissen, Dustman & Schönberg 2014) extended the analysis to the general labor market. This is also the only study which investigates wages. It finds only small peer effects on wages, especially among high-skilled occupations (typically investigated in previous studies of knowledge spillover), but larger peer effects among low-skilled occupations (investigated in previous studies of social pressure). In many cases, whether you are affected by your peers depends on your social group. Park (2016) and Bandiera, Barankay & Rasul (2010) identify friendship groups using surveys, and find that productivity is different for individuals working near friends. Kato and Shu (2009) find that Chinese textile workers are affected by the ability of workers in another social group and not their own, a finding which they interpret as group competition.

In this paper, we add an historical dimension to the extant literature by investigating whether peer effects existed in the past. We investigate the importance of peers for men's and women's earnings in gender-mixed workplaces where the majority of workers were paid according to productivity. For workers on piece-rates, increased output would translate directly into increased

earnings. We measure peer quality using experience in the industry, and look for correlations between a worker's hourly earnings and the average peer experience of his or her peers. Since different groups of workers may interact in different ways, we examine peer effects separately by gender and experience of the individual.

We consider four different hypotheses about why we might observe a correlation between an individual's hourly earnings and the experience of co-workers. One possible explanation is that more capable workers choose to work at firms where other workers were also more capable, possibly because productive workers enjoyed the company of other productive workers. However, it is by no means clear that working with co-workers you have chosen increases productivity. Park (2016) finds that working in close proximity to your friends actually reduces output six percent. Bandiera, Barankay, and Rasul (2010) find that working with more capable friends increases productivity, while working with less capable friends decreases output, though their results may be driven by the workers' desire to maintain proximity to their friends when picking fruit. A second possible reason for peer effects is social pressure, which could have either positive or negative effects on output. If those around you are producing more output, you may feel shame or guilt if you fall behind and thus produce more because you are working harder. On the other hand, workers on piece rates have been known to exert social pressure on other workers to reduce output so as not to induce reductions in the piece rates.[2] A third potential explanation is teamwork. If multiple workers contribute to the production of the same good, then skilled co-workers increase the output of the team. While cigar rollers did not cooperate in production, many rollers would use leaves put together by a bunchmaker, so the skill of a bunchmaker may potentially have affected the output of a roller. However, the fact that nearly all rollers were paid piece-rate wages suggests that teamwork was not an important contributor to output. Finally, workers may also learn form their co-workers. The workshop provided opportunities for workers to learn not only by doing but also by watching and mimicking others. To the extent that workers can learn from each other and build up skills that they otherwise would not have, there may also be “knowledge spillover.” If you learn from your co-workers, then workers with more skilled co-workers should learn more and earn higher wages. While the first explanation is purely sorting, the remaining explanations imply

[2] In 1919 two workers at the Amoskeag Mills in New Hampshire were expelled from the union for exceeding the union's standard for a day's work. They folded 525 to 550 cloths a day, while the union standard was 450. (Hareven, 1982, p. 143).

that workers are more productive if they work with more productive peers and that a firm's total productivity exceeds the sum of individual worker productivities.

Data and methods

Our data come from an exceptionally rich survey of the Swedish tobacco industry. Concern about economic and issues from 1880 led to considerable data collection via surveys and censuses in the US and Europe. As part of this movement, the *Swedish Board of Commerce* instigated large-scale statistical surveys of industries of which tobacco was one (surveyed in 1898). Industries were surveyed in their entireties with one set of questions for employers, and another for employees. Employers were asked about the number of employees, their earnings, machinery, working hours, employment contracts and regulations, fringe benefits, experiences of strikes and lock-outs. Workers were asked about the date and location of birth, civil status, number of children, health status, present occupation, year when entering the branch as well as the present occupation, year when employment at the present factory began, weekly income, wage form, and whether they were union members or subscribers to a benefit society. The ambition was to collect data from all workers employed at the point in time when the agents visited the factory. In total, the agents managed to collect answers from 4,380 tobacco workers. We limit our study to workers in the main production task, cigarmaking.

Cigar production was the most important branch of the tobacco industry, accounting for almost 70 percent of total employment. Cigar making was a three stage-process: preparation work, rolling, and sorting and packaging. Preparation involved handling of the raw tobacco and fermentation. Rolling was undertaken either by hand or with the help of a wooden mold. Finally, the cigars were placed on frames to dry, sorted by quality, and packed into boxes. Cigar production was at the time of the survey factory-based, with a clear division of labor according to skill. Cigar production was a craft skill and relatively un-mechanized by international standards (Cox 2003:124; Elmquist 1899:64). Raw tobacco preparation was unskilled work, whereas rolling and sorting were considered more difficult.[3] Rolling required dexterity while sorters needed experience to grade products by quality. The traditional training period for cigar makers and sorters was at least two years but the rapid expansion of cigar production and the introduction of cigar making molds shortened the learning process, and made apprenticeship less common by this

[3] North American cigar makers were also considered skilled workers (Cooper 1987).

period (Elmquist 1899:96-98; Oakeshott 1900:565). In 1898, two-thirds of cigar workers were women, similar to the ratio prevailing in the wider industry. Women were more likely than men to be on the lower rungs of the job ladder, working as preparatory workers or bunch makers. Nevertheless, men and women with similar skills worked side by side within individual factories (Collett 1891:460-473; Elmquist 1899). Women could join the cigar makers' union but fewer women than men chose to do so.

We are able to match workers to firms and aggregate co-worker characteristics to measure peer effects. We restrict our sample to workers for whom we have complete data. We also restrict the sample to workers age 15 and older, working in firms with at least ten employees. Since workers reported both weekly earnings and hours worked, we are able to use hourly earnings as our dependent variable (i.e., the natural logarithm of weekly earnings divided by hours worked during a normal working week). This is particularly useful in the case of gender analysis, since the danger of using weekly wages is that women may be paid less because they work shorter hours.[4] Earnings refer to wage earnings and do not include the value of fringe benefits, which were trivial in the Swedish tobacco industry by 1898. We know whether the worker was paid an hourly wage rate or a piece rate, but measure the hourly wage as average earnings per hour in both cases. Piece rates were individual and gender-neutral but varied according to task and quality of the product, and also across firms. Since piece rates were task-based (e.g., rolling) and related to the product (e.g., standard cigar), workers in the same job were on the same wage form, and could not choose which wage form they wanted. Neither was it a discretionary choice for the individual worker to opt for a certain piece-rate. 92 percent of men and 83 percent of women in our sample worked on piece-rates. Preparatory workers were least likely to be paid piece-rates (only half of them were), and rollers were most likely to be paid piece-rates (99 percent were).

Table 1 presents descriptive statistics for the men and women in our sample. On average women earned two-thirds as much as men. They were also younger and had both less experience in the occupation and shorter tenure with their current firm. We know the worker's age and the number of years of experience in the current occupation, so we calculate the age at which the worker started to work in the occupation. We do not know whether the worker had previously

[4] There was variation in hours, but essentially no part-time work. Only 5 workers worked fewer than 40 hours per week. Average hours per week were 56, with a standard deviation of 4.4. On average women worked about one hour per week less than men.

worked in a different occupation, and cannot infer anything about education from this variable, but we include it to control for variation in wages due to age as opposed to experience. Men seem to have begun work in the occupation at a younger age than women. Women were also less likely than men to be married or to live with children.

In addition to the worker characteristics, we also have information on the firm where they worked. As discussed above, we expect larger and more profitable firms, and firms with a more heavily male workforce, to pay more. We measure firm size as the total workforce (in hundreds), including non-cigarworkers who are not in our sample. We measure firm profitability as the value of the profit that the firm reported for tax purposes, divided by the total number of workers of all types (Firm Profit per Worker). To avoid picking up the worker's own gender we define Percent Female as the percentage of the individual's co-workers who are female. We also include controls for two other firm characteristics. Since firms in larger cities might pay more if workers required a compensating differential for the higher cost of living or urban disamenities, we include a dummy variable indicating whether the firm was located in a central city (Stockholm, Gothenburg, or Malmö). Firms with a highly unionized workforce might pay more if the union had bargaining power, though firms without unions might pay high wages to discourage the formation of a union (Freeman and Medoff 1984 Ch. 10). As for Percent Female, we define Percent Unionized as the percentage of the individual's co-workers who were union members, so that the individual's own union membership does not affect the variable.

Table 2 shows average wages and the number of workers by gender and occupation. Females earned lower wages in every occupational category except bunchmaker, where they earned on average 50 percent more than the males. This inverted gender gap is explained by the lack of adult males in bunchmaking; male bunchmakers had an average age of 16, and none were older than 18. Female bunchmakers, on the other hand, had an average age of 25, and ranged in age from 15 to 60. Among the other occupational groups, the gender wage gap was smallest among rollers and largest among preparatory workers. Stanfors et.al. (2014) demonstrate that individual characteristics explain the entire gender wage gap for piece-rate workers, though not for time-rate workers.

We estimated standard OLS models to analyze the determinants of hourly wages for men and women separately. First we analyze the importance of individual characteristics for earnings, then we control for firm-level characteristics, and finally we add co-worker characteristics. Our

analysis thus provides a crucial and entirely novel empirical angle by assessing whether individual wages in the past were affected by the firm's characteristics or by co-workers' characteristics.

Who You Are

We begin by asking to what extent the wage was determined by individual characteristics of the worker. Table 3 demonstrates that individual characteristics explain most of the variation in wages between different workers of the same gender. Both men and women earned more if they had children at home, perhaps because dependents gave them a greater incentive to work hard (Burnette and Stanfors 2012). Both men and women earned more if they were married; this association could reflect either work effort or selection into marriage. Given that overall unionization of the workforce did not increase wages (see below), the positive impact of union or benefit society membership on wages is probably the result of positive selection into these organizations.

Our experience controls suggest that experience in the occupation was important in determining the wage but that tenure at a particular firm was not. Figure 1 graphs the wage-experience profiles suggested by the first and third columns of Table 3.[5] There are two profiles for each gender, one with tenure always zero, and one with tenure equal to experience, but the two lines are indistinguishable, telling us that firm tenure did not matter. While tenure was not important, experience in the occupation clearly was. For both genders there seems to have been a training period during which wages rose rapidly with experience. At some point, though, workers became proficient and their wages stopped rising.

The experience profiles suggest that males and females started their cigar-making careers at similar wages, but that female wages stopped rising earlier than male wages, resulting in lower wages for experienced women than for experienced men. These profiles suggest that we should look for differences in how men and women were trained. In fact, we find that women were less likely to be apprenticed than men. Among workers with less than five years of experience in the occupation, 41 percent of the men but only 11 percent of the women were apprentices.[6] Occupation and apprenticeship status had significant effects on wages. As we would expect for

[5] For an explanation of why we use the quadratic spline as the functional form, see Burnette and Stanfors (2015).

[6] This relationship is confirmed by a probit regression of the dummy variable apprentice on sex and experience. Being female has a significantly negative effect on the probability of being an apprentice.

workers investing in general training, apprentices earned less than non-apprentices. Workers doing the less-skilled tasks of preparatory work and bunch-making earned less than rollers, and sorters earned more. Wage differences across tasks were similar for men and women.

Where You Work

Wages may reflect not only differences in characteristics of individual workers, but also differences across firms. There are a number of reasons that wages might differ across firms. If working conditions differ, some firms may have to pay compensating differentials to attract workers. It is also possible that workers were sorted by unobserved characteristics, leading some firms to have higher wages because they had more productive employees. There may also have been differences across firms related to efficiency wages. Firms that found monitoring more difficult may have paid higher wages to elicit effort. If the labor market for our cigar workers was similar to the current labor market, then we would expect larger and more profitable firms to pay more.

We begin by examining average earnings by firm size and profitability. We define small firms as those with less than 50 employees (including non-cigarmakers), medium firms as those with 50 to 100 employees, and large firms as those employing more than 100 workers. Low-profit firms are those earning less than 200 krona per year per worker (approximately the median). Table 4 presents average wages by category. Wages varied little with firm size, but were slightly lower for men at small firms and for women at medium firms. High-profit firms paid more to men but not to women. These patterns, however, could be due to sorting of workers across firms. Larger and more profitable firms hired older and more experienced workers. They hired workers who were on average less healthy, perhaps because those workers were older.

To examine how important firm characteristics were after controlling for observed individual characteristics, we add firm characteristics to the regressions from Table 3. The regressions in Table 5 include all of the variables from columns 2 and 4 of Table 3, but those coefficients are not reported to save space. Firm characteristics contribute to explaining the variation in wages. Including measured firm characteristics increases the R-squared slightly, from 0.73 to 0.76 for men and from 0.64 to 0.69 for women. Unmeasured firm characteristics also mattered for wages. Including firm fixed effects (not reported in the table) further increases the R-squared to 0.80 for men and 0.72 for women, so differences across firms explain 7 percent of wage

variation for men and 8 percent of wage variation for women. The fixed effects suggest that wage differences across firms were fairly large and were greater for women than for men. For women the difference between the highest-wage firm and lowest-wage firm was 1.12 log points, while for men the difference was 0.78 log points.

In wage regressions at the individual level large firms are weighted more heavily than small firms. Following Blanchard, Oswald and Sanfey (1996) we estimate two different types of firm-level regressions. First we average all variables by firm (Table 6). Because percent unionized is essentially the same thing as the average of "union" across firm employees we do not include the Percent Unionized variable in Table 6. We also use a two-stage procedure in which we regress earnings on all individual characteristics and firm fixed effects, and then regress the firm fixed effects on measured firm characteristics (Table 7). Since firm size and profits are missing for some firms we have only 35 observations for men and 40 for women. These regressions have low power due to the small number of degrees of freedom, and the results are generally not statistically significant.

We find that earnings increase with firm size for men but not women. We use two different functional forms for firm size. First we include dummy variables for medium and large firms, as defined above. We also use a quadratic functional form. For men we find a positive relationship between earnings increase with firm size in Table 5. The quadratic specification suggests that wages rose at a decreasing rate with firm size. In Table 5 the quadratic function for men reaches a maximum at a size of 261 employees; only two firms in the sample were larger than this. In Table 7 the results are weaker and not statistically significant, and in Table 6 the coefficient on large firms is negative. For women the point estimates are negative, though none of the coefficients are statistically significant. While some studies of contemporary labor markets find smaller firm size effects for women, they still find positive effects (Oi and Idson, 1999, p. 2181-2). Thus our results suggest that firm size mattered less a century ago than it does today; firm size may have increased men's earnings, but it did not benefit women at all.

The effects of the percentage of the workforce that is female are also different from those in current labor markets. We find that the percentage of the workforce that is female reduces male wages in Table 5, but the coefficients are not significant in Table 7, and are positive in Table 6. For women, working with other women has a positive but not statistically significant effects on wages. These results are not consistent with employee discrimination, but could be caused by the

existence of some employers who have a taste for discrimination that leads them to both hire fewer women and pay men more.

We also include a control for the value of the firm's profit per worker. If expectations of fairness enforced rent-sharing then firms with higher profits would also pay higher wages. The results again suggest a difference across gender. Table 5 and 7 suggest that men earned higher wages at more profitable firms, but the coefficients are negative and insignificant in Table 6. For women firm profits never have a significant effect on earnings. It is possible that men, but not women, had a gift-exchange relationship with the firm, leading to higher wages for men at profitable firms. Gender differences in rent-sharing may be an additional reason for the rise in wage discrimination which Goldin (1986, 1990) and Owen (2001) suggest were related to job ladders and efficiency wages. Our results are somewhat different from those for Sweden at the end of the twentieth century, where men gained more than women from working in a more profitable firm, but women still gained (Nekby 2003).

How was it possible for employers who paid piece-rate wages to engage in profit-sharing with men but not women? There are two channels by which this might happen even if men and women were paid equal piece-rates. First, a few workers were paid time-rate wages. About half of preparatory workers and 20 percent of sorters were paid time-rates wages. Table 3 reveals that men received a greater premium for being a sorter, and a smaller penalty for being a preparatory worker, than women. In addition, among preparatory workers men were less likely than women to be working on piece-rates; only 15 percent of male preparatory workers (compared to 52 percent for female preparatory workers) were on piece-rates wages. Second, firms that hired no female rollers may have paid more. Firms that hired no female rollers did not have particularly high profits overall, but profits varied considerably and the earnings of rollers were positively correlated with profits among this group. If a few profitable firms paid more and hired no female rollers, then men but not women could benefit from firm profitability even if all firms that hired both sexes paid equal piece-rates to their male and female rollers.

Firms in the three largest cities paid women more than other firms. The coefficients on city location are always positive and are sometimes significant. This city premium may have compensated workers for urban disamenities or for a higher cost-of-living in the larger cities. While the effect of being a union member, as an individual characteristics, was positive, working in a firm where your co-workers were union members did not increase earnings; the coefficients

are negative. This suggests that unions were not effective in increasing wages at the firm level, and leads us to conclude that the positive coefficient on individual union membership reflects positive selection into union membership.

With whom you work

In addition to firm characteristics we also examine social interaction at the workplace and ask whether co-worker quality and characteristics mattered for individual earnings. To measure peer effects, we include in the wage regression a measure of the quality of your co-workers. To avoid the reflection problem, we need a measure of peer quality that is not itself a function of co-worker earnings. In our main specification we measure peer quality using experience in the industry. Average peer experience is the average experience level of all cigar-makers at the firm other than the individual whose wage is being observed. As a result average peer experience varies slightly across individuals within firms.

If we treat all co-workers as one group, the average experience level of co-workers had no significant effect on wages for either gender (Tables 8 and 9, columns 1 and 2). If we divide co-workers by gender, female peer experience seems to increase wages of both men and women (column 3), but controlling for firm characteristics removes this effect (column 4). We learn that it is important to control for firm characteristics when examining peer effects. There were no peer effects for cigar workers in general.

If peers affect wages by providing informal training, then we should see effects mainly for newer workers who have not yet reached the level of proficiency where their wage profiles becomes flat. To test this hypothesis we divide the sample into low-experience and high-experience workers and run separate regressions on each group. Since the wage-experience profiles have a steep portion and a flat portion, we define the training period as the time during which the wage-experience profile is steep.[7] We also interact average peer experience with the worker's own experience, to assess whether the effect of peers changes as workers acquire experience.

[7] This point is determined by the data. The break-point of the quadratic spline was chosen by searching among at least ten possible break-points and choosing the break-point that gave the highest R-squared. Thus we define low-experience women as women with 5 years of experience or less, and low-experience men with 8 years of experience or less. We also tried defining low-experience women as having 8 years of experience or less, and low-experience men as having 5 years or less, and got substantially similar results.

Table 10 presents the results for men. Point estimates suggest that male peer experience has positive effects for low-experience men and negative effects for high-experience men, though these effects are generally not statistically significant. The interaction between experience and male peer experience is significant, suggesting that male peer experience becomes less valuable as men acquire experience in cigarmaking, and even becomes harmful for men with more than 12 years of experience. The effects of firms characteristics differ somewhat by experience level. Firm size matters slightly more, and firm profitability significantly less, for low-experience men.

The strongest peer effects appear for low-experience women. Table 11 shows that low-experience women earned significantly higher wages when they worked with more experienced women. High-experience women, however, got no benefit from working with experienced peers. The interaction models suggests that women benefit significantly from female peers when they first begin making cigars, but that the benefit erodes with time.[8] At the mean, a ten-percent increase in average female peer experience will increase the earnings of a low-experience worker by about 1.7 percent. This is similar to the effect of coworker productivity on cashier productivity found by Mas and Moretti (2009), and larger than the effect of coworker wages on individual wages found by Cornelissen, Dustmann, and Schonberg (2013). A one standard deviation increase in female peer experience increases the hourly earnings of low-experience women by 0.16 standard deviations, which is substantially larger than the learning effects among teachers found by Jackson and Bruegmann (2009).

The results in Table 9 and 10 suggest that peer effects among our cigarmakers existed only for a subset of workers and did not cross gender lines. Low-experience women clearly benefit from experienced women, but not from experienced men. High-experience women, however, received no benefits from having quality peers. High-experience men may have earned less when working with other experienced men, though the effects are weak.

To explore whether peer effects might be driven by joint production, we examine whether the earnings of rollers were affected by the quality of assistants (defined as preparatory workers plus bunchmakers). Rollers and bunchmakers were most likely to work together in team, and we think it is also possible that the quality of work done by preparatory workers helped cigar rollers to earn more. Thus we examine the effects of average experience by sex among assistants on the

[8] The effect reaches zero at 17.8 years of experience.

wages of rollers. Table 12 presents the results. Observations are lost because not all firms had workers in all four categories (male and female rollers and assistants). Since there were relatively few male assistants to start with, only 32 observations were available, so we do not report regressions for male assistants. Peer experience had no effect on the earnings of female rollers. Male rollers may have earned less when working with more experienced female assistants, but the effects is significant only at the 10 percent level. Overall, rollers do not seem to have benefited from more experienced co-workers, throwing doubt on the hypothesis that peer effects were the result of externalities in the production process. Female assistants seem to have benefited from the experience of female rollers, but also seem to have been harmed by more experienced male rollers. This supports our claim that peer effects among cigarmakers worked along gendered lines.

Robustness Checks

To see if our results are robust to different definitions of the peer variables, we make two changes in the way we measure peer quality. First we use predicted wage as a measure of peer quality. We don't want to use the actual wage because both own wages and peer wages would be similarly affected if some firms simply paid higher wages than other firms. Also, using peer wages is subject to the reflection problem; if my wages are a function of my peers' wages, then my peers wages are a function of my wages. We get around these problems by using predicted wages rather than actual wages. We use the regressions in columns 2 and 4 of Table 3 to predict the wages of your peers. Predicted wages are thus the component of your wage that is determined by your individual characteristics. The results are presented in columns 1 and 2 of Table 13. Men are not affected by peer quality, but women are. Women do not benefit from their male peers, and they benefit from their female peers only when they are new to the occupation; the effect of female peers has disappeared by 13 years of experience. For women with no experience, a one standard deviation increase in the average predicted wage of their female peers will increase their wage by 0.046 log points, or 0.11 of a standard deviation.

Our second alternative measure of peer quality is a modified version of experience. Since training seems to have been complete in five years for women and eight years for men, and further years of experience had little effect on wages, we top-code peer experience at five years for women and eight years for men. Thus, male peers who have eight years of experience are just as valuable as those with twenty years of experience. Columns 3 and 4 of Table 13 presents the

results. Men do not benefit from having high-quality peers and, as in table 10, the negative coefficient on the interaction suggests that high-experience men earned less in the presence of other high-experience men. For women the results are consistent with previous estimates. Newly hired women gain from working with experienced female peers, but this effect erodes as the worker gains experience and has disappeared by 13 years of experience. A woman with no experience earns 0.065 log points, or 0.15 standard deviations, more if the average quality of her female peers is one standard deviation higher.

In addition to trying alternative measures of peer quality, we also check the robustness of our data by including peer quality of same-sex peers only. This allows us to include observations from all-female firms in the female equation.[9] Results are consistent with previous results; male peer quality has no effect for new male workers, but over time male peer quality has an increasingly negative effect on men's earnings. Female peer quality has a positive effect on earnings for new female workers, but this effect erodes with time. A woman with no experience earns 0.052 log points more, or 0.12 standard deviations, if the average quality of her female peers is one standard deviation higher.

Discussion of Peer Effects

Our results suggest a distinct pattern of peer effects. Most often the quality of your peers had no effect on your earnings, but in certain circumstances it mattered. Our most robust finding is that women starting in the occupation benefited from having high-experience female peers, but that once women acquired experience their peers did not matter. A weaker result is that men with high experience may have earned less when their male peers also had high experience. In light of these results, we assess the possible explanations of peer effects.

We first examine which of the four explanations best explains the female peer effects. Cornelissen, Dustmann and Schonberg (2013, p. 30) distinguish between peer pressure and knowledge spillover effects by assuming that, in low-skilled repetitive jobs, knowledge spillover should only be relevant for workers in their first two years on the job. Since they observe peer effects that persist for experienced workers, they conclude that at least part of the peer effect must be due to peer pressure. Our results suggest the opposite conclusion; since only low-experience

[9] For men we do not get an increase in the sample size because firm profits are missing for all the all-male firms of sufficient size.

women are effected by the experience of their peers, the results are more consistent with knowledge spillovers than peer pressure.

Since our results are correlational, they could be the result of workers choosing where to work based on who their co-workers will be, but if peer effects were driven by worker choice, we would expect the effects to be stronger for men than for women. In the early nineteenth century workers lived quite close to their places of work due to high transportation costs. Men were more likely to be heads of household, who chose where the family lived, and women were more likely to live with their husbands or fathers and thus would have had limited choice in where they worked. We find, instead, stronger effects for women than for men. We do not think that firm sorting provides an adequate explanation for the female peer effects. If peer effects were the result of high-ability workers choosing to work with their high-ability friends, we would not expect the result to fade after a few years. The fact that only low-experience women gain from working with experienced women, and that once they are trained the effect disappears, suggests that if women were choosing their workplace, then they were choosing it on the basis of training potential rather than social groups.

Our results also do not fit with the hypothesis that peer effects were driven by joint production. The extensive use of piece-rates suggests that employers felt they could, with reasonable accuracy, assign output to a specific worker. In addition, we find no evidence that the earnings of rollers were affected by the quality of their assistants. The pattern of peer effects observed for women is, however, consistent with the existence of informal training. Women new to the occupation had higher earnings if they worked with experienced women. However, since the occupation could be fully learned in a few years, women with more than five years of experience had learned the necessary skills and did not benefit from working with experienced co-workers. Informal training occurred along gender lines. Women learned from older women, but not from men.

For men, however, the results do not suggest knowledge spillover. The estimated effects are weak, so it is possible that men experienced no peer effects. If they did, however, these effects must have been due to some type of social interaction. We rule out knowledge spillover because experienced rather than inexperienced men are affected. We also rule out joint production because the quality of assistants did not increase the earnings of rollers. Selection could contribute to the male peer effects if men choose to work with their friends. Park (2016) found that working with

your friends reduced productivity, presumably because socialization distracted from work, but that workers enjoyed this socialization enough that they were willing to give up 5 percent of their wage to enjoy it. Male cigarworkers may also have engaged in socialization that reduced earnings. The effects may also have been caused by peer pressure, if men pressured other men to work more slowly. This is consistent with stories about male work cultures where those that worked too fast were called "rate busters."[10] However, if such pressure operated it did not seem to affect low-experience men.

While other explanations are possible, we find informal training to be the most likely explanation for our most robust peer effect, the effect of female peer experience on the earnings of women new to the occupation. Men do not seem to have benefited from the same informal training channels, but men were more likely than women to receive formal training as an apprentice. For men, social interactions among high-experience workers may have reduced productivity, but here our results are relatively weak. In either case we find that the cigar workshop was a gendered workplace, as peer effects did not cross gender lines. Even when working at the same job in the same firm, there was a social barrier between the genders.

Conclusion

In this study we have found some evidence that where you work mattered, but the effects look different from those in the current labor market. While modern studies find a robust relationship between wage and firm size, we find no such relationship for women, and for men the positive relationship fades when we regress firm fixed effects on firm size. Modern studies also find that more profitable firms pay both sexes more. We, however, find a positive effect for men only. Firms with more heavily female workforces may have paid less, but these results here are weak. While neither firm size nor profitability matter for women, we do find that firms in the largest three cities paid women more than other firms.

We also find evidence for that with whom you worked mattered, but only under certain circumstances. Among Swedish cigar workers in 1898, experienced female co-workers improve the earnings of new women, but not experienced women. While there are a number of possible

[10] Whyte (1955, p. 4, 39). Rule (1986 p. 120) suggests that piece-rate workers would "take care that over-zealous comrades did not disturb notions of what was 'normal' and thereby not only obtain for themselves a disproportionate share of available work, but risk a lowering of the rate for all."

explanations for this pattern, we think the most likely reason was informal training among women. There is weak evidence of negative peer effects among experienced men, which may have been due to social interaction. Both of these results highlight the gendered nature of social interactions in the cigar workshop.

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Table 1. Descriptive Statistics

	Men N=711		Women N=1,558	
	Mean	SD	Mean	SD
Wages (ore/hour)	24.43	9.14	16.46	6.45
Ln Wage	3.10	0.48	2.72	0.42
Age	34.50	14.43	29.66	12.34
Experience	20.24	15.43	11.05	10.51
Tenure	7.74	10.70	5.66	7.22
Age at Start of Work	14.26	3.87	18.61	7.26
Married	0.42	0.49	0.19	0.39
Previously Married	0.06	0.23	0.08	0.27
Kids at Home	0.42	0.49	0.31	0.46
Union Member	0.80	0.40	0.36	0.48
Benefit Society Member	0.64	0.48	0.51	0.50
Good Health	0.80	0.40	0.72	0.45
Preparation Worker	0.04	0.19	0.27	0.44
Bunchmaker	0.05	0.23	0.15	0.36
Roller	0.83	0.38	0.47	0.50
Sorter	0.08	0.28	0.11	0.31
Apprentice	0.10	0.30	0.05	0.23
Big City	0.62	0.49	0.74	0.44
Firm Size (in 100s of workers)	1.18	1.15	1.56	1.41
Small Firm	0.23	0.42	0.18	0.38
Medium Firm	0.28	0.45	0.25	0.44
Large Firm	0.49	0.50	0.57	0.50
Firm Profit per Worker	236.20	97.11	236.38	86.91
Percent Union	0.64	0.27	0.43	0.32
Percent Female	0.52	0.22	0.75	0.16
Peer Experience	14.76	4.23	13.55	4.59
Male Peer Experience	20.24	6.90	23.65	7.24
Female Peer Experience	10.10	5.25	11.05	4.50

Source: Specialundersökningar Tobaksindustrien 1898, Statistiska avdelningen, HIII b:1 samt HIII b:1 aa vol 1, Kommerskollegiets arkiv, National Archives (*Riksarkivet*), Stockholm.

Table 2. Wages By Gender and Occupation

	Men	Women	Wage Ratio
Prep Worker	17.34 (9.99) 27	11.17 (3.45) 418	0.64
Bunchmaker	8.64 (3.14) 38	13.10 (4.00) 236	1.52
Roller	25.23 (8.02) 587	19.48 (5.76) 733	0.77
Sorter	29.95 (9.94) 59	21.10 (6.41) 171	0.70

Note: For the "Men" and "Women" columns the first number is the average wage, the number in parentheses is the SD of the wage, and the bottom number is the number of observations in that cell.

Table 3. Who You Are

	1	2	3	4
	Men		Women	
Constant	1.9250*** (0.1525)	2.3898*** (0.1228)	1.9768* (0.0838)	2.2694* (0.0703)
Experience	0.3051*** (0.0362)	0.2306*** (0.0354)	0.2735* (0.0413)	0.2078* (0.0320)
Experience Squared	–0.0202*** (0.0038)	–0.0164*** (0.0032)	–0.0262* (0.0069)	–0.0208* (0.0053)
Spline	0.0182 (0.0268)	0.0300 (0.0182)	–0.0040 (0.0317)	0.0030 (0.0247)
Spline Squared	0.0201*** (0.0038)	0.0163*** (0.0032)	0.0259* (0.0069)	0.0207* (0.0053)
Tenure	0.0003 (0.0042)	0.0027 (0.0041)	–0.0022 (0.0039)	–0.0029 (0.0037)
Tenure Squared/100	–0.0039 (0.0091)	–0.0087 (0.0089)	0.0067 (0.0148)	0.0136 (0.0113)
Age at Start of Work	–0.0056 (0.0130)	–0.0184 (0.0112)	0.0040 (0.0050)	0.0059 (0.0043)
Age at Start of Work Squared/100	0.0143 (0.0302)	0.0460* (0.0246)	–0.0253* (0.0086)	–0.0184* (0.0070)
Married	0.0750** (0.0328)	0.0603* (0.0333)	0.0804* (0.0198)	0.0408* (0.0144)
Previously Married	0.0498 (0.0476)	0.0341 (0.0511)	0.0154 (0.0384)	0.0151 (0.0283)
Kids at Home	0.0816** (0.0403)	0.0936** (0.0410)	0.0545* (0.0183)	0.0640* (0.0173)
Union	0.0929** (0.0391)	0.0980** (0.0388)	0.0941* (0.0221)	0.0737* (0.0198)
Benefit Society	0.1633*** (0.0398)	0.1481*** (0.0433)	0.1283* (0.0253)	0.1081* (0.0240)
Good Health	0.0578* (0.0296)	0.0485* (0.0265)	0.0596* (0.0155)	0.0549* (0.0151)
Apprentice		–0.2951*** (0.0621)		–0.3386* (0.0593)
Preparation Worker		–0.2225* (0.1308)		–0.3832* (0.0384)
Bunchmaker		–0.3948*** (0.0825)		–0.3197* (0.0306)
Sorter		0.1344*** (0.0477)		0.1093* (0.0423)
R^2	0.695	0.732	0.484	0.644
N	711	711	1,558	1,558

Note: Standard errors (clustered by firm) are in parentheses. Spline breaks at 8 years for men and 5 years for women.
* = significant at the 10% level; ** = significant at the 5% level; *** = significant at the 1% level
Source: See Table 1.

Table 4. Average Wages by Firm Size and Profitability

	Small	Medium	Large	Low Profit	High Profit
Average Male Wage	23.26	24.74	25.83	23.12	25.33
Average Female Wage	16.60	16.14	16.84	16.59	16.40
Wage Ratio	0.71	0.65	0.64	0.72	0.65
Percent Female	0.63	0.67	0.72	0.74	0.72
Average Age	28.84	31.43	31.88	29.79	32.48
Average Experience	11.67	14.17	14.61	12.83	15.04
Pct Member of Benefit Society	0.40	0.45	0.66	0.51	0.63
Pct. in Good Health	0.80	0.76	0.72	0.78	0.71
Pct. Married	0.24	0.27	0.26	0.28	0.27

Source: See Table 1.

Table 5. Where You Work: Individual Wage Regressions

	Men		Women	
Medium Firm	0.1121** (0.0415)		–0.0195 (0.0360)	
Large Firm	0.0822* (0.0422)		–0.0278 (0.0360)	
Firm Size		0.1155* (0.0574)		0.0091 (0.0377)
Firm Size Squared		–0.0221** (0.0093)		–0.0020 (0.0061)
Firm Profit per Worker/100	0.0435*** (0.0135)	0.0410*** (0.0121)	–0.0096 (0.0170)	–0.0122 (0.0218)
Big City Location	0.0784 (0.0509)	0.0833** (0.0406)	0.0902** (0.0338)	0.0894** (0.0342)
Percent Unionized	–0.1505* (0.0763)	–0.1773** (0.0827)	0.0133 (0.0451)	0.0134 (0.0464)
Percent Female	–0.1557** (0.0738)	–0.1472** (0.0688)	0.1035 (0.0871)	0.1066 (0.0873)
R^2	0.758	0.756	0.685	0.685
N	638	638	1,398	1,398

Note: All regressions include the complete set of individual variables from Table 3. Standard errors (clustered by firm) are in parentheses. * = significant at the 10% level; ** = significant at the 5% level; *** = significant at 1% level
Source: See Table 1.

Table 6. Where You Work: Firm Averages

	Men		Women	
Medium Firm	0.0207 (0.0446)		–0.0358 (0.0622)	
Large Firm	–0.0472 (0.1366)		–0.1137 (0.0744)	
Firm Size		0.0047 (0.1311)		–0.1149 (0.0917)
Firm Size Squared		–0.0008 (0.0208)		0.0232 (0.0164)
Firm Profit per Worker/100	–0.0128 (0.0340)	–0.0039 (0.0310)	–0.0038 (0.0348)	–0.0047 (0.0447)
Big City Location	0.1375 (0.1119)	0.0935 (0.0774)	0.1459 (0.1068)	0.1224 (0.1010)
Percent Female	0.1714 (0.1753)	0.1307 (0.1651)	0.2197 (0.1904)	0.2932 (0.2038)
R^2	0.944	0.942	0.915	0.913
N	35	35	40	40

Note: All regressions include the complete set of individual variables from Table 3. Standard errors (clustered by firm) are in parentheses. * = significant at the 10% level; ** = significant at the 5% level; *** = significant at 1% level

Table 7. Where You Work: Fixed Effects Regressed on Firm Characteristics

	Men		Women	
Medium Firm	0.0705 (0.0606)		–0.0048 (0.0517)	
Large Firm	0.0726 (0.0768)		–0.0443 (0.0455)	
Firm Size		0.0817 (0.0852)		–0.0317 (0.0548)
Firm Size Squared		–0.0163 (0.0149)		0.0043 (0.0104)
Firm Profit per Worker/100	0.0405* (0.0220)	0.0440* (0.0225)	0.0049 (0.0254)	0.0068 (0.0298)
Big City Location	0.0781 (0.0688)	0.0853 (0.0613)	0.1363** (0.0615)	0.1247* (0.0630)
Percent Unionized	–0.1441 (0.1206)	–0.1445 (0.1278)	0.0279 (0.0626)	0.0320 (0.0640)
Percent Female	–0.1244 (0.1010)	–0.1117 (0.0942)	0.0648 (0.1044)	0.0727 (0.1076)
R^2	0.233	0.218	0.271	0.263
N	35	35	40	40

Note: Standard errors (clustered by firm) are in parentheses. * = significant at the 10% level; ** = significant at the 5% level; *** = significant at 1% level

Table 8. With Whom You Worked: Men

	1	2	3	4
Peer Experience	0.0034 (0.0058)	–0.0008 (0.0064)		
Male Peer Experience			–0.0011 (0.0028)	–0.0029 (0.0030)
Female Peer Experience			0.0110*** (0.0036)	0.0005 (0.0056)
Medium Firm		0.1143** (0.0461)		0.1200*** (0.0430)
Large Firm		0.0840 (0.0513)		0.0866 (0.0532)
Firm Profit per Worker/100		0.0436*** (0.0133)		0.0414*** (0.0014)
Big City Location		0.0800 (0.0484)		0.0777 (0.0603)
Percent Unionized		–0.1469 (0.0909)		–0.1527* (0.0798)
Percent Female		–0.1554** (0.0731)		–0.1166 (0.0806)
R^2	0.733	0.758	0.744	0.759
N	711	654	708	637

Note: All regressions include the complete set of individual variables from Table 3. Standard errors (clustered by firm) in parentheses. * = significant at the 10% level; ** = significant at the 5% level; *** = significant at 1% level

Table 9. With Whom You Worked: Women

	1	2	3	4
Peer Experience	0.0043 (0.0037)	0.0023 (0.0049)		
Male Peer Experience			0.0005 (0.0021)	–0.0011 (0.0019)
Female Peer Experience			0.0057* (0.0032)	0.0051 (0.0052)
Medium Firm		–0.0219 (0.0364)		–0.0530 (0.0494)
Large Firm		–0.0316 (0.0377)		–0.0687 (0.0590)
Firm Profit per Worker/100		–0.0126 (0.0194)		–0.0113 (0.0202)
Big City Location		0.0800** (0.0362)		0.0844** (0.0361)
Percent Unionized		0.0024 (0.0543)		–0.0212 (0.0707)
Percent Female		0.1103 (0.0877)		0.1091 (0.1015)
R^2	0.646	0.685	0.661	0.686
N	1,558	1,398	1,413	1,296

Note: All regressions include the complete set of individual variables from Table 3. Standard errors (clustered by firm) in parentheses and p-values in brackets.

Table 10. With Whom You Worked: Results Split by Experience, Men

	Low Experience	High Experience	Interaction
Male Peer Experience	0.0016 (0.0041)	–0.0065* (0.0033)	0.0040 (0.0035)
Male Peer Experience x Own Experience/100			–0.0327*** (0.0093)
Female Peer Experience	–0.0077 (0.0076)	0.0029 (0.0062)	–0.0005 (0.0064)
Female Peer Experience x Own Experience/100			0.0141 (0.0131)
Medium Firm	0.1366*** (0.0487)	0.1281** (0.0574)	0.1223** (0.0445)
Large Firm	0.1818*** (0.0653)	0.0836 (0.0664)	0.0777 (0.0568)
Firm Profit per Worker /100	0.0016 (0.0205)	0.0448** (0.0168)	0.0410*** (0.0145)
Big City Location	0.0730 (0.0846)	0.0845 (0.0630)	0.0685 (0.0626)
Percent Unionized	0.0777 (0.1295)	–0.2130** (0.0858)	–0.1656* (0.0837)
Percent Female	0.0714 (0.1591)	–0.1966** (0.0925)	–0.1426 (0.0894)
R^2	0.780	0.405	0.763
N	202	435	637

Note: Low experience means 8 years of experience or less. All regressions include the complete set of individual variables from Table 3, except that columns 1-4 include only a quadratic in experience rather than a spline and there are no high-experience bunchmakers. Standard errors (clustered by firm) in parentheses and p-values in brackets. * = significant at the 10% level; ** = significant at the 5% level; *** = significant at 1% level
Source: See Table 1.

Table 11. With Whom You Worked: Results Split by Experience, Women

	Low Experience	High Experience	Interaction
Male Peer Experience	–0.0002 (0.0018)	–0.0022 (0.0021)	0.0003 (0.0022)
Male Peer Experience x Own Experience/100			–0.0129 (0.0146)
Female Peer Experience	0.0153** (0.0064)	–0.0014 (0.0046)	0.0151** (0.0062)
Female Peer Experience x Own Experience/100			–0.0846*** (0.0268)
Medium Firm	–0.1177** (0.0530)	0.0084 (0.0513)	–0.0609 (0.0471)
Large Firm	–0.1755*** (0.0630)	–0.0038 (0.0559)	–0.0857 (0.0570)
Firm Profit per Worker/100	0.0139 (0.0231)	–0.0189 (0.0182)	–0.0096 (0.0192)
Big City	0.0879** (0.0398)	0.0556 (0.0364)	0.0696* (0.0323)
Percent Unionized	–0.0435 (0.0725)	–0.05651 (0.0669)	–0.0227 (0.0692)
Percent Female	0.1196 (0.1053)	0.0511 (0.1332)	0.0752 (0.1073)
R^2	0.631	0.565	0.693
N	548	748	1,296

Note: Low experience means 5 years of experience or less. All regressions include the complete set of individual variables from Table 3, except that columns 1-4 include only a quadratic in experience rather than a spline. Standard errors (clustered by firm) in parentheses and p-values in brackets. * = significant at the 10% level; ** = significant at the 5% level; *** = significant at 1% level
Source: See Table 1.

Table 12. Interactions Between Rollers and Assistants

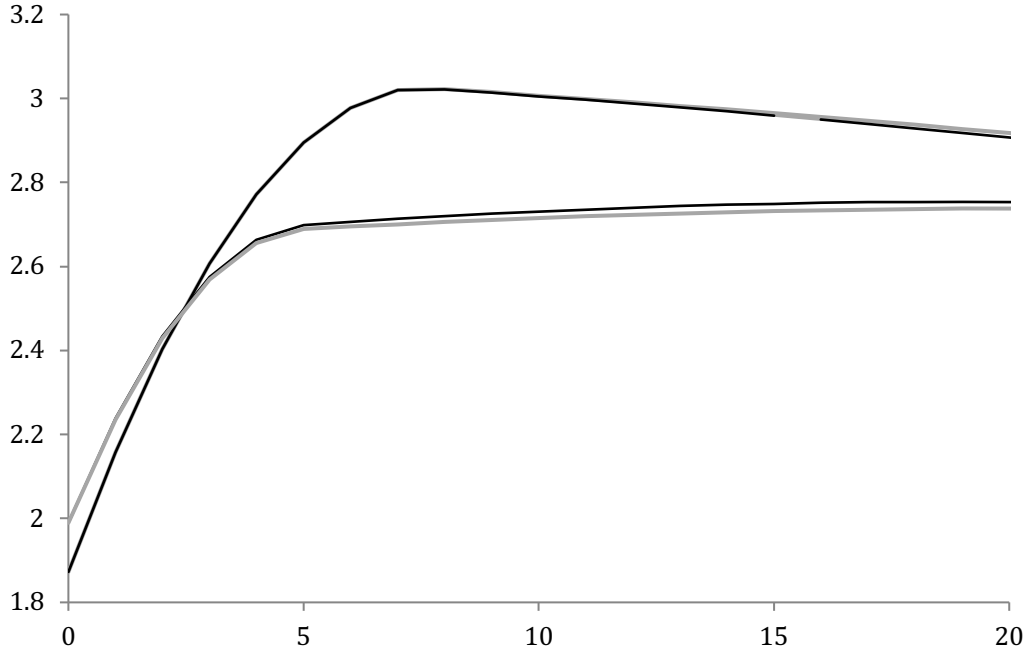
	Male Rollers	Female Rollers	Female Assistants
Male Roller Peer Experience	0.0048 (0.0054)	–0.0044 (0.0064)	–0.0148*** (0.0024)
Female Roller Peer Experience	0.0008 (0.0067)	0.0141 (0.0105)	0.0352*** (0.0037)
Male Assistant Peer Experience	–0.0024 (0.0043)	–0.0005 (0.0076)	0.0035 (0.0033)
Female Assistant Peer Experience	–0.0108* (0.0057)	–0.0002 (0.0091)	0.0093 (0.0077)
Medium Firm	0.2169 (0.2122)	0.2876 (0.1818)	0.0612* (0.0333)
Large Firm	0.6171 (0.4363)	0.5125* (0.2697)	–0.0742 (0.0839)
Firm Profit per Worker/100	0.0310 (0.0345)	–0.1779** (0.0762)	–0.2058*** (0.0224)
Big City Location	–0.1808 (0.1287)	–0.0287 (0.0916)	0.0843** (0.0357)
Percent Unionized	–0.0191 (0.2055)	–0.2694 (0.2031)	–0.1793** (0.0815)
Percent Female	–0.5198 (0.7695)	–0.9648* (0.5048)	0.4703** (0.1633)
R^2	0.606	0.537	0.675
N	247	310	312

Note: All regressions include the complete set of individual variables from Table 3. Assistants include both preparatory workers and bunchmakers. Standard errors (clustered by firm) in parentheses and p-values in brackets.
* = significant at the 10% level; ** = significant at the 5% level; *** = significant at 1% level

Table 13. Robustness Checks

	Predicted Wage		Experience Topcoded		Same-Sex Peers Only	
	Men	Women	Men	Women	Men	Women
Male Peer Quality	–0.0630	0.1381	0.0101	0.0032	0.0033	
	(0.1703)	(0.0982)	(0.0226)	(0.0137)	(0.0033)	
Male Peer Quality x Own Experience	–0.0039	–0.0079	–0.0014**	–0.0008	–0.0003**	
	(0.0046)	(0.0057)	(0.0006)	(0.0007)	(0.0001)	
Female Peer Quality	–0.1337	0.3526*	–0.0181	0.0896**		0.0116**
	(0.1501)	(0.1745)	(0.0316)	(0.0398)		(0.0058)
Fem. Peer Quality x Own Experience	–0.0026	–0.0276***	–0.0002	–0.0070***		–0.0008**
	(0.0023)	(0.0100)	(0.0006)	(0.0021)		(0.0002)
Medium Firm	0.1147***	–0.0508	0.1267***	–0.0634	0.1212**	–0.0207
	(0.0400)	(0.0408)	(0.0434)	(0.0418)	(0.0412)	(0.0364)
Large Firm	0.0971**	–0.0689	0.1004**	–0.0821	0.0777	–0.0377
	(0.0438)	(0.0441)	(0.0446)	(0.0504)	(0.0507)	(0.0380)
Firm Profit per Worker/100	0.0415***	–0.0076	0.0387***	–0.0048	0.0422***	–0.0109
	(0.0130)	(0.0186)	(0.0134)	(0.0178)	(0.0139)	(0.0189)
Big City Location	0.1065*	0.0852**	0.1042	0.0641**	0.0842	0.0679**
	(0.0626)	(0.0419)	(0.0865)	(0.0315)	(0.0517)	(0.0311)
Percent Unionized	–0.1215	–0.0113	–0.1287	0.0082	–0.1620**	–0.0070
	(0.0862)	(0.0714)	(0.0865)	(0.0734)	(0.0808)	(0.0572)
Percent Female	–0.0047	0.0445	–0.0969	0.0818	–0.1401	0.0598
	(0.1025)	(0.1081)	(0.0831)	(0.0958)	(0.0883)	(0.1022)
R^2	0.761	0.693	0.762	0.695	0.762	0.691
N	637	1296	637	1296	637	1398

Figure 1. Wage-Experience Profiles for Male and Female Cigar makers, Movers and Stayers



Note: Movers have tenure always equal to zero. Stayers have tenure equal to experience.
Profiles for movers and stayers are indistinguishable.
Source: See Table 3.