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Abstract

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Keywords

nonemployment spells and wages

Cover Page Footnote

The author acknowledges an intellectual debt to Audrey Light and Manuelita Ureta, whose paper "Early Career Work Experience and Gender Wage Differentials" was one inspiration for this study. She also thanks Stephen Trejo for helpful comments and Steve McClaskie for answering questions about the data.

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TIME OFF AT WHAT PRICE? THE EFFECTS OF CAREER INTERRUPTIONS ON EARNINGS

CHRISTY SPIVEY*

Using the National Longitudinal Survey of Youth 1979, the author explores how nonemployment spells and career expectations affected men's and women's wages. Wage profiles were affected by total nonemployment time, by recent work interruptions, and by some past interruptions. Statistically significant interruptions were more numerous for women than men, but the wage loss associated with any given interruption was less severe for women. Future career interruptions, which workers presumably anticipate in many cases, affected current investment in human capital to some degree for both sexes. The wage effects of the timing of experience (defined by the fraction of weeks worked, by specific years) correspond closely to the wage effects of interruptions (calendar years without work): when the analysis accounts for the former, little additional penalty is found to have been associated with the latter. A very small fraction of the gender wage gap was attributable solely to timing of experience.

The possible earnings effects of career interruptions have long been a concern to labor economists when estimating traditional Mincerian wage equations. Early investigations of such effects focused on women, who are more likely than men to spend time out of the work force. More recent work has also investigated career discontinuity among men, partly in order to determine whether there are gender differences in how time out of the labor force affects wages. This paper focuses on how career interruptions and career expectations affect the wages of women and men.

Many of the previous studies, as well as casual observation, suggest that individuals who interrupt their employment can generally expect a reduction in their earning power upon their return to work, whether or not they return to the same occupation. Speculation suggests several factors that could contribute to the loss of earning power: skeptical employers, lost contacts, decreased confidence, and eroded skills. In addition, theory suggests that individuals who expect to interrupt their career in the future will accept a higher wage early in the career in trade for slower subsequent wage growth as a result of reduced human capital investment. Thus, taking expecta-

*Christy Spivey is a Ph.D. candidate at the University of Texas at Austin. She acknowledges an intellectual debt to Audrey Light and Manuelita Ureta, whose paper "Early Career Work Experience and Gender Wage Differentials" was one inspiration for this study. She also thanks Stephen Trejo for helpful comments and Steve McClaskie for answering questions about the data.

Computer programs used to generate the results are available from the author at Department of Economics, 1 University Station C3100, BRB 1.116, Austin, Texas 78712. Phone: (281) 773–5546; Fax: (512) 471–3510; email: cspivey@eco.utexas.edu.

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tions into account allows for a clearer picture of a person's lifetime wage profile.

This paper fits in well with and extends the more recent research on career interruptions. It uses similar, non-traditional wage equations to answer several questions. Do workers who interrupt their career pay a penalty? Is the penalty different for men and women? Does the timing of the interruption matter, and are these effects different for men and women? Is there a rebound effect when workers return to the labor force, and how do such effects compare for men and women? However, this study uses more complete data over a longer time span than have previous studies. It also extends recent research by attempting to answer two questions about career expectations. First, does the expectation of an interruption affect current and future wages? Second, does that effect (if it exists) differ between the sexes?

The answers to these questions could help labor economists in at least two important ways. First, they obviously could have a bearing on how best to specify a wage equation. Second, they are also essential if researchers want to know what factors contribute to the gender earnings gap, as well as earnings gaps between other groups. The fact that women are more likely than men to have career interruptions, with repercussions for their human capital accumulation, must be taken into account along with the many other factors that could affect the gender earnings gap—among them, women's job choice and career expectations, the effect on productivity of unpaid work associated with motherhood and housework, unobservable differences between mothers and non-mothers in such factors as "career motivation," and of course discrimination in the labor market—before that gap can be satisfactorily understood and before policy decisions regarding it are made. In this paper, a non-traditional wage equation is used in an effort to determine how much of the gender wage gap is due to the timing of work experience. This study also departs from previous work on career interruptions by trying to answer how career expectations affect current wages in a true panel data setting and by addressing the implications of career expectations for the gender gap.

Literature Review

Most researchers acknowledge that wages rise more quickly with time spent in paid employment than with time spent in other non-educational activities. Hence, the wages of a worker upon reentry into the labor force are expected to be below those of similar workers who have remained continuously employed. In addition, it may be the case that the reentry wage is below the pre-interruption wage for the given worker, depending on the length of the interruption and assuming the worker did not interrupt his or her career for educational purposes. Once workers return to work, wages are expected to rebound. Human capital theory explains this rebound as resulting from the restoration of skills. Others argue that another factor contributing to the rebound is the time it takes for firms to learn about a worker's productivity.

All of the papers in this literature draw from the theoretical model presented by Mincer and Polachek (1974), which is an extension of the basic formulation of the human capital earnings function to account for discontinuities in the labor market experience of individuals. A wide variety of studies since the early 1970s have investigated the existence of a wage depreciation effect for workers with career interruptions. In general, most studies have focused on women and have indeed found a statistically significant depreciation effect, one that ranges from around 0.6% to over 5% annually. Past studies fit into two general categories: those estimating cross-sectional equations using wages at one point in time, and those that have been able to use wages from at least two points in time.

Cross-Sectional Studies

Much of the early empirical work exploring the effects of career interruptions on wages was limited to cross-sectional analysis using retrospective data on labor force experience. Some studies simply regressed the logarithm of wages at one point in time on total work experience, total time spent out of the labor force, and a vector of individual characteristics. Rekko et al. (1993), for example, found that a year spent not working reduced the wage rate by approximately 1.4%. Other studies were more ambitious and segmented time spent working and not working in a chronological manner. The earliest study of this type, by Mincer and Polachek (1974), examined married women aged 30–44 who were surveyed as part of the 1966 National Longitudinal Survey (NLS) of Mature Women. Using a vector of work experience segments and a vector of home-time segments as explanatory variables, they found that a career interruption was associated with not only a penalty of foregone experience or tenure, but also a statistically significant negative annual return of approximately 1.5%.

Mincer and Ofek (1982) estimated a similar segmented empirical specification using the same data set, focusing on short-run depreciation, the loss associated with the most recent interruption, and long-run depreciation, the loss associated with the sum of previous interruptions. They found that the long-run depreciation effect ranged from 0.6% to 1.1%, while the short-run effect ranged from 3.3% to 7.6%. They concluded that the cost of work interruption is substantially higher in the short run than in the long run. Corcoran (1977) conducted a study similar to that of Mincer and Ofek using a cross-section from the Panel Study of Income Dynamics (PSID). Her results differed somewhat from those of previous studies: labor force withdrawals, she found, had either statistically insignificant or very small significant negative effects on wages. Overall, labor force withdrawals were associated with statistically significant depreciation only when the interruption occurred soon after the completion of school and the start of one's first job; withdrawals that occurred well into one's career had little impact.

Panel Data Studies

Mincer and Ofek extended their cross-sectional model by using the wage at the time of the most recent interruption and the wage at the time of reentry into the work force to estimate wage change equations. They estimated that real wages at reentry were from 5.9% to 8.9% lower per year than at the point of labor market withdrawal. They also found that a rapid restoration of wages occurred throughout the first five years after reentry and that only a relatively small part of this growth was tenure-related. In a sense, then, their findings implied that it costs less to restore human capital than to accumulate it.

Corcoran, Duncan, and Ponza (1983) estimated wage change equations similar to those of Mincer and Ofek for the years 1967–79, using a national sample of white women from the PSID. However, they estimated wage change equations over the whole time span, which is 13 years, rather than using only wages just prior to the last labor force withdrawal and immediately following, as Mincer and Ofek did. This enabled the estimation to take advantage of more of the information that was available in the panel data set. They also found that wages dropped significantly following a career interruption (from 3.3% to 4.1% per year) and that rapid wage growth followed reentry (5.1% in the first year), so that the net loss in wages from dropping out of the labor force was small.

Several more recent panel studies have considered career interruptions of both men and women. Using a Swedish company-level data set, Stafford and Sundstrom (1996) attempted to explore the role of signaling by comparing the effects of career interruptions on wages for men versus women. They estimated earnings equations with cumulative measures of work experience and interruption time and found that time out had a much larger negative wage effect for men than for women.

Light and Ureta (1995) departed from the trend of employing cumulative measures. Considering young, white workers from the NLS young men and women samples, they estimated a wage model that included an array of experience variables measuring the fraction of time spent working in the last year, 2 years ago, 3 years ago, and so on, back to the beginning of an individual's career. An array of indicator variables was created that equaled one when the career was in progress but the individual did not work in the last year, 2 years ago, and so on.

Light and Ureta's model yielded markedly higher estimated returns to experience and lower returns to tenure for both men and women than have models that measure work experience cumulatively and use the quadratic functional form. The data rejected the standard model but not their model. This result suggests that conventionally specified wage equations provide a misleading picture of early career wage growth not only for women but also for men. Light and Ureta's finding that men are penalized more severely than women for career interruptions accords with results reported by Stafford and Sundstrom. For men, the drop in earnings upon returning to work after a year-long interruption was about 25%. Four years after the interruption, wages were still 10% lower than they would have been if no interruption had occurred. Women experienced an initial drop of about 23%, and they caught up to their continuously employed counterparts after 4 years. Unfortunately, missing data are a particular problem with the NLS's samples of young men and women because interviews sometimes occur every two years, not annually. As a result, the number of weeks worked is not known for every year of a respondent's career. The number of weeks worked may also be missing when a given individual is not interviewed in a given year.

In a provisional study, Kunze (2002) used a model similar to that of Light and Ureta and a West German panel data set spanning the years 1975 to 1997 for 17,000 individuals. She was able to distinguish several different reasons for career interruptions: unemployment, parental leave for female workers, national service for male workers, and other non-work spells. As expected, she found that human capital depreciation was less severe in the long run than in the short run; in addition, it differed across reasons for the interruption.

Comparing this model to the more traditional Mincerian quadratic model, Kunze found little difference in predicted wages for men between the two models. For women, however, the more flexible model predicted much higher wages than the Mincerian model, and the gap widens as experience accumulates; in fact, after 10 years of accumulated work experience the difference is about 20%. The drawbacks to this study include the fact that only full-time, skilled workers who were observed in apprenticeship training after high school and who had no further education were included. Individuals were thus mainly followed over their early careers, but workers who were not working continuously from age 26 to age 30 were dropped in an attempt to analyze more highly attached workers.

Data and Empirical Specification

The panel data analysis for this paper uses the National Longitudinal Survey of Youth 1979 (NLSY79), which began annual interviews in 1979 with over 12,000 individuals aged 14–22, continued interviewing that sample annually through 1993, and since 1994 has followed the group with interviews every two years. This study focuses on the men and women from the representative sample of the NLSY79, comprising 6,111 individuals, over the time period 1979–2000.

The NLSY79 contains a longer and more complete record of work history information than any of the other NLS samples. A weekly labor force status is available for each respondent up to the date of the very last interview, regardless of how often the respondent has been interviewed in the past. For example, even though the survey has been conducted every two years since 1994, respondents are now asked to report their labor force activity in the previous two years. Moreover, a respondent who misses an interview in a given year in the NLSY79 is asked to fill in his or her labor force activity since the date of the last interview. This information is updated in the weekly labor status array. The other NLS samples that have followed respondents' careers for a substantial period have not been consistently updated in this way. Because of the great detail, missing data for number of weeks worked in a given year are not as great a problem for the NLSY79 as for the young male and female cohorts used by Light and Ureta. On the other hand, recall may be a more serious problem, although the design of the survey attempts to minimize this.

The key variables created from these data include an array of experience variables that measure the fraction of time worked in the last year, 2 years ago, and so on, back to the beginning of the career. These are called FrcWksWrkd_1, FrcWksWrkd_2, …, FrcWksWrkd_{22} (some individuals are observed as many as 22 years into their career), where FrcWksWrkd_n denotes the fraction of weeks worked *n* years ago, by calendar year. This fraction equals zero either because an individual's career has not begun or because that person experiences a true career interruption. To distinguish between those two conditions, an interruption dummy variable array is created, Intrp_1, Intrp_2, …, Intrp_{20}. When FrcWksWrkd_n is zero but the career is in progress, Intrp_n equals one. Intrp_n therefore capture the effect of not working for an extended period of time.

While there is certainly nothing magical about a calendar year, there are three reasons for these particular formulations of the FrcWksWrkd_n and Intrp_n variables: the NLSY79 data facilitate using a calendar year; career interruptions of less than 6 months are less likely to have an impact on wages, especially for women who take maternity leave, as current state laws require that women be allowed to return to work at the same pay rate within a certain time range (6 months is most common, but for some states it is as much as a year); and this formulation is a good first step because it allows direct comparison with the results of the most recent studies (Light and Ureta 1995; Kunze 2002), which also used the calendar year.

Defining the start of an individual's career, which also determines when work experience begins accruing, is somewhat arbitrary. Here the start year is defined as the first year that an individual is at least 18 years of age and either not enrolled in school or employed full-time (greater than 30 hours per week) for at least 45 weeks out of the year. The start year ranges from 1979 to 1993. Approximately 30% of individuals started their career in 1979, and about 90% began their career before 1985.

Approximately 2,994 individuals, some 60% of whom were male, had worked some amount in every year following the start of the career. While men may have had more active and continuous work histories than women overall, they experienced career interruptions as well. Total time spent out of the labor force for men was 2.9 years on average, with a standard deviation of 3.7. Women spent on average 5.3 years out of the labor force, with a standard deviation of 5.1. The total number of times Intrp_n took on the value of one was, on average, 2.53 for women and 0.93 for men. For women with more than a high school education, this value was 1.75 compared to 3.12 for those with a high school education or less. For men, the corresponding numbers were 0.69 and 1.09, respectively. Although the Intrp_n dummy variables only capture interruptions of a sizeable duration and may not capture the whole duration, these cursory summary statistics indicate that more educated workers interrupted their careers less frequently or for shorter periods of time than did the less educated.

Table 1 presents the percentage of respondents who worked more than a given amount of time after their career began, by gender and educational level, taking into account any missing data. Educational attainment in 1994 is used as the benchmark, since there are fewer missing values for that year than for later years and less than 5% of the sample was enrolled in 1994. More-

Table 1. Percentage of Respondents Who Work More Than X% of the Time after the Start of Their Career, by Gender and Schooling Level in 1994.

Group	*10%*	*30%*	*50%*	*70%*	*90%*
Women	**95**	**87**	**75**	**57**	**29**
Less Than High School	82	62	39	22	5
High School	97	88	72	52	24
Some College	99	93	83	65	35
College Graduates	99	96	88	73	49
Graduate School	100	97	91	81	49
Men	**97**	**94**	**89**	**79**	**49**
Less Than High School	97	91	82	64	31
High School	98	96	91	81	48
Some College	99	97	92	81	50
College Graduates	99	99	97	94	72
Graduate School	99	98	97	92	61

over, the percentage enrolled did not decrease much in subsequent years.

It is clear from the table that the more educated tended to work for a larger fraction of potential career time than did the less educated. The only anomaly is that men who attended graduate school were slightly less attached to the labor force than were male college graduates, but this anomaly occurs because some men were still attending graduate school as of 1994. The numbers also reveal that, not surprisingly, women were less attached to the labor force than were men. Overall, about 75% of women had worked more than half of their potential career, as compared to 89% of men. But men were not as attached to the labor force as might be expected: less than 80% of them worked more than 70% of the time. These numbers suggest that women took more time to accumulate a given amount of experience than men, yet men seem to have experienced appreciable nonemployment spells.

These percentages are slightly lower than similar calculations made by Light and Ureta. For their comparable analysis, however, Light and Ureta only analyzed men and women from ages 24 to 30, and they confronted important gaps in the data. Nevertheless, in both cases, substantial variation in accumulated experience remained after controlling for gender and education. As Light and Ureta pointed out, this suggests that wage equations that employ the sum of experience and many individual-level controls may not be the best way to measure differences in work experience.

Several variations on the following general wage model are explored in this paper:

$$\ln(\text{W}\textsc{age})_{it} = \alpha + \beta_1 X_{it} + \beta_2 Z_i + u_{it}. \qquad (1)$$

The dependent variable is the natural logarithm of the average hourly wage, deflated by the CPI, for person i at time t. The X_{it} represent regressors that vary over time for each person, while the Z_i include the time-invariant regressors. The X_{it} include experience measures, such as the previously discussed FrcWksWrkd_1, FrcWksWrkd_2, …, FrcWksWrkd_{22} and Intrp_1, Intrp_2,…, Intrp_{20}, as well as dummy variables indicating whether an individual was married, whether the individual had children present in the household, how much education had been attained (less than high school, high school graduate, some college, college graduate, or graduate school), whether the person was currently enrolled in school, region of residence (Northeast, North Central, South, West), and whether the individual was working part-time (less than 30 hours per week). The unemployment rate for the labor market of current residence is also included. The impact of the educational attainment variables is allowed to vary over the two decades, as are the experience variables where possible, in accordance with previous findings that the returns to education and experience were changing over this time period (see, for example, Katz and Murphy 1992; Bound and Johnson 1992). Here the Z_i include only a dummy variable indicating if the person was white. Separate equations are estimated for men and women.

The error term u_{it} can be expressed as the sum of an individual component v_i and a random component ε_{it}, both random variables with zero mean and constant variance. The random component is assumed to be uncorrelated with the explanatory variables, but it is likely that the individual-specific component is correlated with a number of the regressors. In fact, a Hausman test following random effects estimation of all specifications presented below allows rejection of the null hypothesis of no correlation at the 1% significance level. Thus fixed effects estimates are presented, which exploit the within-person variation across time and yield consistent estimates.[1]

Although weeks worked are available for years in which individuals were not interviewed, wages are not. Thus, observations for the years 1995, 1997, and 1999 cannot be included.[2] Individuals potentially reported wages for up to 19 years, but not all wages are used. Observations that precede the starting date of one's career are excluded. Obviously, years in which an individual did not work have no positive wage observations either. Individuals who never worked are thus excluded. Only 114 respondents, over 56% of them female, reported never working throughout 1979–99 once their career began. The few individuals (11) with full years of missing labor force status are also excluded. These criteria yield a sample of 5,935 individuals, 49% of whom are male, and 69,909 observations. Individuals appear in the unbalanced panel a minimum of once and a maximum of 19 times, with an average of approximately 11.6 times.

Results

Specification 2 (Basic Segmented Model) in Table 2, which includes total years of actual experience and total years of nonemployment and their respective squares, verifies that total time out of the labor force mattered. In both cases, wages fell at a decreasing rate with cumulative nonemployment time. The finding that total time out of the labor force mattered, and not just whether an interruption occurred, suggests that not all human capital accumulation was job-specific. For men, the loss incurred from the first year of nonemployment in each decade was very similar, and virtually identical in the 1990s, to the return to the first year of experience in that decade. Women faced a similar scenario, with a slightly larger difference between the absolute values of the return to experience and the return to nonemployment in the 1980s. The penalty from the first year of nonemployment was approximately 74% of the gain from the first year of employment for women in the 1980s, compared to over 82% for men. Thus, the absolute loss associated with nonemployment was larger for men in both decades, and women were not penalized as much as men for nonemployment in the 1980s relative to the return to experience, though they were penalized at a similar rate in the 1990s. In addition, although overall returns to experience were

[1]Hausman-Taylor (1981) instrumental variables estimation could potentially increase efficiency by exploiting both within-person and cross-person variation, but these estimates are not presented here because the gain from doing so is minimal. The only advantage is to allow estimation of the coefficient on the race variable, the only time-invariant variable in the model. Since this model includes no endogenous time-invariant variables, Hausman-Taylor instrumental variables will yield the same coefficients as fixed effects on all the time-varying variables.

[2]If these years' position in the business cycle differs from that of the years we observe, the wage effects could be misestimated. I attempted to fill in the data for these years by averaging the values for preceding and subsequent years; however, no substantive differences resulted.

lower in the 1990s than in the 1980s, there was a slight convergence in the returns to experience between the sexes over time.

These results are consistent with Light and Ureta's finding that interruptions are less damaging for women than for men in the sense that the initial wage loss is smaller and the rebound is quicker. It is possible that, in general, women select into careers that are compatible with nonemployment, so that human capital is more easily restored. Light and Ureta also suggested that men may be more likely than women to stop working for reasons that are negatively correlated with their productivity. These results are also consistent with women's increasing commitment to the labor force, since women's relative penalty from nonemployment increased by the 1990s, while their return to experience crept closer to that of men. While discrimination against women may have been declining, women may have been expecting fewer interruptions in the 1990s onward and may have been transitioning to jobs less conducive to human capital restoration.

Specification 3 (Segmented Model with Interruption Dummies) is meant to investigate how the timing of interruptions affected wages. Experience is still measured cumulatively, but the INTRP_1, INTRP_2, ..., INTRP_{20} dummy variables are included. This specification is motivated by the disparate results of previous studies that estimated wage change equations, in which the difference between an individual's first and last observed wage over the course of the career was estimated as a function of the duration of the most recent interruption, the duration of the sum of other nonemployment time, the sum of experience prior to the most recent interruption, and the sum of experience after the most recent interruption. Some researchers, such as Mincer and Ofek, have found that the loss associated with the most recent interruption is statistically significant and greater than the loss associated with the sum of previous nonemployment time; however, others have found that the most recent interruption has no statistically significant effect on wage growth. Corcoran, for example, found that only interruptions occurring near the start of one's career have any statistically significant impact.

My replication of a basic wage change equation for women, presented in Appendix Table A1, suggests that the most recent career interruption alone did not have a statistically significant impact on wage growth, though total time spent out of the labor force did. This result seems counterintuitive, as one would expect interruptions that occur relatively recently to have more impact on wage growth than those that occur farther in the past. On the other hand, this result may simply be a function of the data used. My data span a much longer time period than those used in previous studies that have estimated wage change equations, and the likelihood that any given interruption over such a long period will be statistically significant may be low. Because of the inconsistent results and the fact that wage change equations do not make use of all available data, considering the timing of nonemployment in a true panel study is relevant.

For both men and women, the null hypothesis that the coefficients on the interruption dummies are jointly equal to zero is rejected at the 1% significance level. The estimates indicate that more recent interruptions mattered as far back as 4 years ago in a consistent manner for men. Prior to that, only interruptions 8 years ago and 20 years ago are statistically significant at all. Why an interruption occurring 8 years ago mattered and one occurring 7 years ago did not is unclear, but the large negative effect of an interruption 20 years ago is difficult to ignore. This statistically significant result could be owing to a combination of two factors.

First, as Corcoran found, interruptions early in the career matter. Second, the construction of the data only allows interruptions as far back as 20 years. For some individuals, an interruption 20 years ago may not have been the first career interruption, so this variable may be picking up earlier interruptions. For women, with one or two exceptions, interruptions mattered as far back as 9 years, so statistically significant interruptions were more numerous for women than for men. However, in general, the absolute and relative losses associated with interruptions were not as steep for women as for men, which is consistent with the estimates of Specification 2, the Basic Segmented Model. For example, men experienced a loss of almost 4.8% if they did not work three years ago, which is 68% of the return to the third year of experience in the 1980s, whereas women faced a loss of 2.9%, only 47% of the return to the third year of experience in the 1980s. What Specification 3 adds beyond Specification 2 is that the effect of past interruptions was more persistent for women, since they continued to be influential as far back as 9 years. A possible explanation that is also consistent with a lesser penalty for women than for men for a given interruption is that employers viewed women's work interruptions as a signal that these workers were more likely to leave in the future, and hence hired them for jobs that were compatible with nonemployment, such as ones that required less training.[3]

The most detailed specification, Specification 4 (Work History Model with Interruption Dummies) in Table 3, is very similar to that of Light and Ureta. It accounts both for differences in total work experience accumulated and for the timing of the experience by including the fraction of weeks worked array as well as the interruption dummy variables. While some individuals are observed as far as 22 years into their career, so that the experience array could contain as many as 22 elements, estimation results for only 10 years are included separately, as the statistical significance of the fraction of weeks worked falls off approximately 10 years ago for both men and women. For years prior to 10 years in the past, summary measures are calculated. The fraction of an individual's career that was spent working prior to 10 years ago is calculated, along with the number of year-long interruptions experienced.

The results indicate that, for both sexes, once the timing of work experience has been taken into account with the fraction of weeks worked variables, interruptions have no statistically significant additional loss associated with them. The null hypothesis that the interruption variables are jointly equal to zero cannot be rejected at the 20% level of significance for either men or women.

Specification 5 (Basic Work History Model) presents the estimation with just the fraction of weeks worked variables included. These estimates imply that specifications including the sum of experience underestimate the return to experience in more recent years and overestimate the return in past years. Light and Ureta's finding that their more flexible work history model yielded higher returns to experience once a person's career had been under way for about 6 years is not corroborated here. This is not immediately apparent by looking at the estimates, but it can be seen by examining Figure 1, which shows the general trend of the predicted natural logarithm of wages against years of experience for Specifications 2, 3, and 5 for men and women. Specification 1, the Basic Mincer Model, is not graphed because it is almost indistinguishable from the graph of Specification 3, the Segmented Model with Interruption Dummies. The overall trends look remarkably similar for men and women, which Light and Ureta also found. Prior to about 12 years of experience, the various specifications yield only small differences in predicted wages. After that, Specification 2 yields slightly higher returns to experience than Specification 3,

[3]Specification 1 (Basic Mincer Model) is presented for the sake of comparison. The returns to experience in Specification 3 are similar to those in Specification 1. Comparing the estimates from Specification 2 to Specification 1, the returns to experience when interruption time is included are very similar for both sexes during the 1990s, but they increase slightly for the 1980s. The reason for this is not readily apparent, but it should be kept in mind that these are different models. It may also have something to do with the fact that not all experience is observed for individuals who began working prior to 1979, so the observed experience has inflated returns. Why the inclusion of nonemployment exacerbates this possible inflation remains unclear.

Table 2. Fixed Effects Estimates of Wage Equations Using Continuous Experience Measures, 1979–2000.

	Specification 1: Basic Mincer Model		*Specification 2: Segmented Model*		*Specification 3: Segmented Model with Interruption Dummies*	
Independent Variable	*Coefficient*	*t-stat*	*Coefficient*	*t-stat*	*Coefficient*	*t-stat*
Men						
Exp '80s	0.085***	28.2	0.102***	31.8	0.086***	28.4
Exp^2 '80s	–0.004***	–13.4	–0.005***	–16.6	–0.004***	–13.7
Exp '90s	0.051***	17.8	0.053***	18.1	0.048***	16.3
Exp^2 '90s	–0.001***	–9.2	–0.001***	–9.6	–0.001***	–8.2
Nonemp '80s			–0.093***	–13.0		
Nonemp^2 '80s			0.009***	7.2		
Nonemp '90s			–0.055***	–12.1		
Nonemp^2 '90s			0.002***	.5.9		
Intrp1					–0.094***	–5.1
Intrp2					–0.032**	–2.0
Intrp3					–0.048***	–3.3
Intrp4					–0.038***	–2.6
Intrp5					–0.010	–0.7
Intrp6					–0.019	–1.3
Intrp7					0.003	0.2
Intrp8					–0.035**	–2.1
Intrp9					0.000	0.0
Intrp10					0.022	1.1
Intrp11					–0.012	–0.6
Intrp12					0.002	0.1
Intrp13					–0.015	–0.6
Intrp14					–0.001	–0.1
Intrp15					–0.028	–0.9
Intrp16					–0.036	–1.1
Intrp17					0.053	1.4
Intrp18					–0.009	–0.2
Intrp19					–0.035	–0.5
Intrp20					–0.162**	–2.0
Part-Time	0.049***	5.8	0.051***	6.0	0.051***	6.1
Enrolled	–0.132***	–14.9	–0.126***	–14.3	–0.131***	–14.9
High School Grad. '80s	–0.064***	–4.1	–0.032**	–2.1	–0.054***	–3.4
Some College '80s	–0.080***	–3.9	–0.026	–1.3	–0.063***	–3.1
College Grad. '80s	0.060**	2.4	0.143***	5.5	0.079***	3.0
Graduate School '80s	0.033	1.0	0.126***	3.9	0.053*	1.6
Less High School '90s	–0.062***	–3.2	–0.001	–0.1	–0.035	–1.8
High School Grad. '90s	–0.082***	–3.7	–0.003	–0.2	–0.050**	–2.2
Some College '90s	0.010	0.4	0.108***	4.0	0.048*	1.8
College Grad. '90s	0.189***	6.3	0.298***	9.7	0.226***	7.4
Graduate School '90s	0.205***	6.2	0.330***	9.6	0.244***	7.3
Married	0.055***	9.2	0.050***	.8.5	0.055***	9.3
Children Present	0.011*	.1.9	0.012*	1.9	0.011*	1.9
Urban	0.017**	2.5	0.013*	1.8	0.015**	2.3
Northeast	0.081***	4.6	0.078***	4.4	0.079***	4.5
North Central	–0.043***	–2.7	–0.045***	–2.9	–0.042***	–2.7
West	0.080***	4.7	0.079***	4.6	0.080***	4.7
Unemployment Rate	–0.028***	–11.7	–0.032***	–13.1	–0.029***	–12.1
White	(dropped)		(dropped)		(dropped)	
R^2 Within	0.266		0.273		0.268	
No. Observations	36,429		36,429		36,429	

Continued

Table 2. Continued.

Independent Variable	Specification 1: Basic Mincer Model Coefficient	t-stat	Specification 2: Segmented Model Coefficient	t-stat	Specification 3: Segmented Model with Interruption Dummies Coefficient	t-stat
Women						
Exp '80s	0.069***	23.1	0.081***	26.2	0.070***	23.5
Exp^2 80s	–0.002***	–7.6	–0.003***	–10.1	–0.003***	–8.2
Exp '90s	0.046***	17.5	0.045***	17.1	0.039***	13.9
Exp^2 90s	–0.001***	–7.7	–0.001***	–7.9	–0.001***	–5.4
Nonemp '80s			–0.065***	–11.8		
$Nonemp^2$ 80s			0.005***	6.6		
Nonemp '90s			–0.049***	–16.0		
$Nonemp^2$ 90s			0.002***	10.5		
Intrp1					–0.076***	–6.1
Intrp2					–0.046***	–4.4
Intrp3					–0.029***	–2.9
Intrp4					–0.020**	–2.0
Intrp5					–0.015	–1.5
Intrp6					–0.023**	–2.2
Intrp7					–0.030***	–2.8
Intrp8					0.010	0.9
Intrp9					–0.028**	–2.4
Intrp10					0.010	0.8
Intrp11					–0.009	–0.7
Intrp12					–0.026*	–1.8
Intrp13					0.003	0.2
Intrp14					–0.001	–0.1
Intrp15					0.005	0.2
Intrp16					–0.036*	–1.7
Intrp17					–0.031	–1.2
Intrp18					–0.029	–1.0
Intrp19					0.036	0.9
Intrp20					–0.086*	–1.7
Part-Time	–0.017***	–3.3	–0.009*	–1.8	–0.012**	–2.3
Enrolled	–0.069***	–9.8	–0.067***	–9.6	–0.068***	–9.7
High School Grad. '80s	–0.016	–1.0	0.007	0.4	–0.003	–0.2
Some College '80s	–0.013	–0.7	0.033	1.6	0.006	0.3
College Grad. '80s	0.112***	4.7	0.182***	7.5	0.137***	5.7
Graduate School '80s	0.127***	4.3	0.205***	6.9	0.158***	5.4
Less High School '90s	–0.038**	–2.1	0.044**	2.1	0.021	1.1
High School Grad. '90s	–0.012	–0.6	0.087***	3.7	0.056**	2.5
Some College '90s	0.053**	2.2	0.161***	6.4	0.124***	5.0
College Grad. '90s	0.188***	7.0	0.306***	10.8	0.260***	9.3
Graduate School '90s	0.270***	9.2	0.397***	12.9	0.347***	11.5
Married	0.014***	2.8	0.010**	2.1	0.014***	2.8
Children Present	–0.033***	–5.7	–0.007	–1.2	–0.022***	–3.8
Urban	0.013*	2.0	0.009	1.3	0.010	1.5
Northeast	0.096***	5.8	0.089	5.4	0.092***	5.6
North Central	0.043***	2.9	0.037***	2.5	0.040***	2.8
West	0.111***	6.8	0.109***	6.8	0.110***	6.8
Unemployment Rate	–0.010***	–4.5	–0.014***	–6.4	–0.013***	–5.6
White	(dropped)		(dropped)		(dropped)	
R^2 Within	0.229		0.238		0.233	
No. Observations	33,480		33,480		33,480	

*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

Table 3. Fixed Effects Estimates of Wage Equations Using Alternative Experience Measures, 1979–2000.

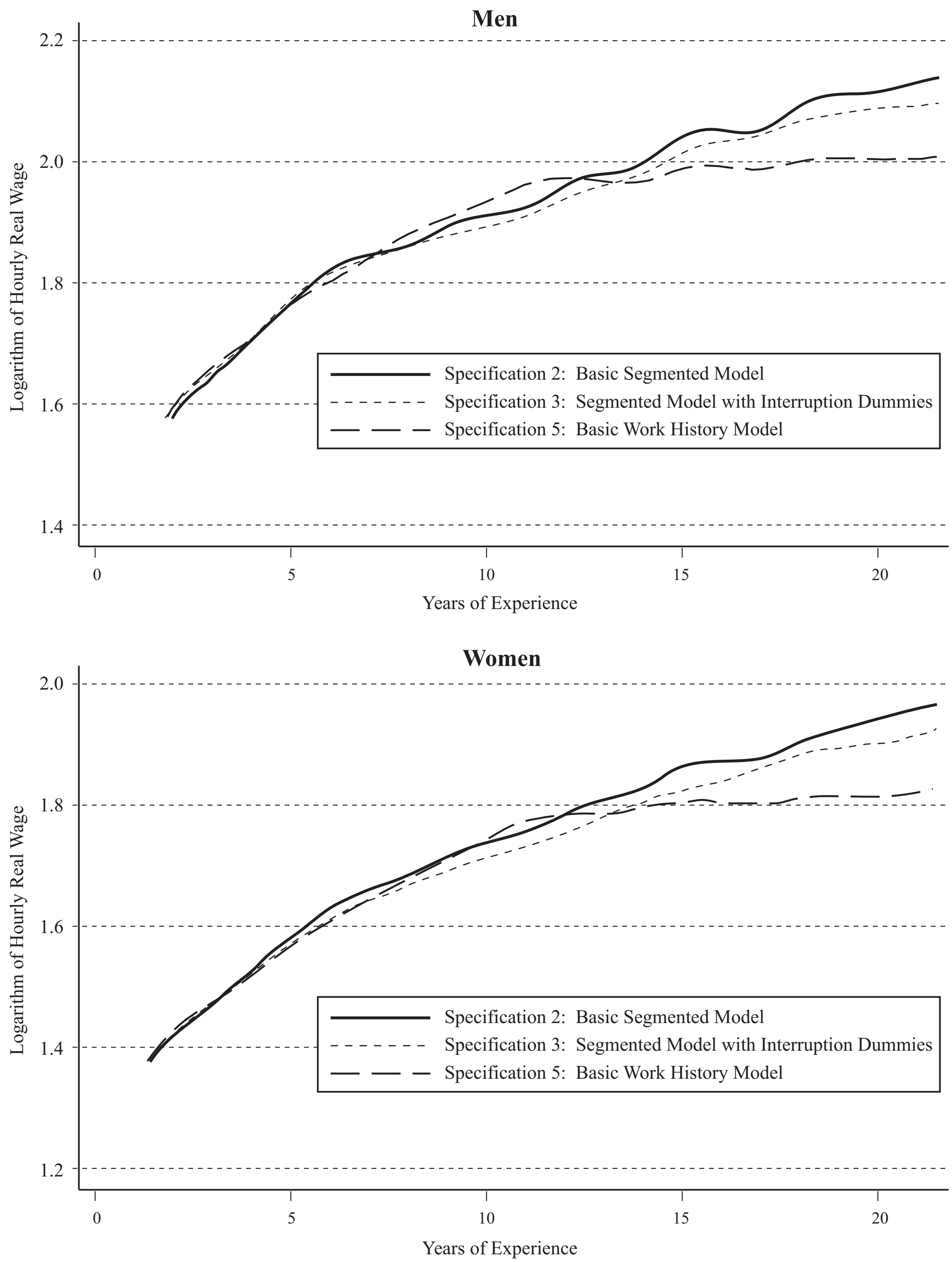
	Men				*Women*			
	Specification 4: Work History Model with Interruption Dummies		*Specification 5: Basic Work History Model*		*Specification 4: Work History Model with Interruption Dummies*		*Specification 5: Basic Work History Model*	
Independent Variable	*Coefficient*	*t-stat*	*Coefficient*	*t-stat*	*Coefficient*	*t-stat*	*Coefficient*	*t-stat*
FrcWksWrkd1	0.173***	20.6	0.169***	21.2	0.160***	21.9	0.157***	23.3
FrcWksWrkd2	0.072***	11.6	0.069***	11.3	0.051***	8.8	0.051***	9.1
FrcWksWrkd3	0.068***	8.6	0.069***	9.1	0.065***	9.1	0.064***	9.4
FrcWksWrkd4	0.050***	5.8	0.052***	6.3	0.046***	5.9	0.046***	6.2
FrcWksWrkd5	0.039***	4.5	0.038***	4.6	0.031***	3.9	0.032***	4.2
FrcWksWrkd6	0.041***	4.7	0.042***	4.9	0.027***	3.4	0.032***	4.2
FrcWksWrkd7	0.019**	2.2	0.019**	2.3	0.036***	4.4	0.039***	5.0
FrcWksWrkd8	0.029***	3.2	0.034***	3.8	0.032***	3.7	0.027***	3.4
FrcWksWrkd9	0.023**	2.5	0.023**	2.5	0.026***	3.0	0.029***	3.5
FrcWksWrkd10	0.019**	2.0	0.017*	1.9	0.026***	2.9	0.023***	2.8
FrcWksWrkd11 +	0.083***	9.6	0.083***	9.8	0.078***	9.3	0.079***	9.7
Intrp1	0.020	1.0			0.013	1.0		
Intrp2	0.027	1.6			0.000	0.0		
Intrp3	–0.004	–0.3			0.003	0.3		
Intrp4	–0.015	–1.0			0.000	0.0		
Intrp5	0.001	0.1			–0.004	–0.4		
Intrp6	–0.008	–0.5			–0.017	–1.6		
Intrp7	0.000	0.0			–0.017	–1.5		
Intrp8	–0.035**	–2.0			0.018	1.6		
Intrp9	–0.004	–0.2			–0.018	–1.4		
Intrp10	0.015	0.8			0.014	1.1		
# Intrp11+	0.006	1.0			0.000	–0.1		
Part-Time	0.063***	7.5	0.063***	7.5	–0.001	–0.1	–0.001	–0.2
Enrolled	–0.129***	–14.7	–0.129***	–14.7	–0.068***	–9.7	–0.068***	–9.7
High School Grad. '80s	–0.049***	–3.2	–0.048***	–3.2	–0.004	–0.3	–0.004	–0.3
Some College '80s	–0.054***	–2.7	–0.053***	–2.7	0.018	0.9	0.017	0.9
College Grad. '80s	0.100***	3.9	0.101***	4.0	0.162***	6.8	0.161***	6.9
Graduate School '80s	0.077**	2.4	0.079**	2.5	0.176***	6.1	0.175***	6.1
Less High School '90s	–0.096***	–8.7	–0.097***	–8.9	–0.071***	–4.9	–0.075***	–5.3
High School Grad. '90s	–0.103***	–6.3	–0.103***	–6.4	–0.033*	–1.9	–0.035**	–2.1
Some College '90s	–0.005	–0.3	–0.006	–0.3	0.042**	2.1	0.039**	2.0
College Grad. '90s	0.164***	6.2	0.164***	6.3	0.181***	7.5	0.178***	7.5
Graduate School '90s	0.184***	6.2	0.185***	6.3	0.265***	9.9	0.261***	9.9
Married	0.047***	7.9	0.046***	7.8	0.012***	2.6	0.012**	2.6
Children Present	0.015**	2.4	0.015**	2.4	–0.014**	–2.3	–0.015***	–2.6
Urban	0.003	0.4	0.003	0.4	–0.001	–0.1	0.000	–0.1
Northeast	0.073***	4.2	0.073***	4.2	0.085***	5.2	0.085***	5.2
North Central	–0.045***	–2.9	–0.045***	–2.9	0.037**	2.5	0.037**	2.6
West	0.075***	4.4	0.075***	4.4	0.108***	6.7	0.108***	6.7
Unemployment Rate	–0.034***	–14.6	0.034***	–14.8	–0.019***	–8.6	–0.019***	–8.6
White	(dropped)		(dropped)		(dropped)		(dropped)	
R^2 Within	0.273		0.272		0.241		0.241	
No. Observations	36,429		36,429		33,480		33,480	

*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

while Specification 5 yields lower returns. These trends also differ from Kunze's findings. She showed that the difference between her work history model and the simple Mincerian model was very small for men, but the work history model consistently yielded higher returns for women.

The possible reasons for the differences between the studies are numerous. Each study uses a slightly different sample and spans a different time period, with Kunze's sample coming from a different country. Both Light and Ureta and Kunze used a young sample; Kunze's sample was espe-

Figure 1. Predicted Wage-Experience Profiles.



Note: Figures are plotted using medium splines. The x-axis is divided into 15 equal-width intervals and then the median of y and the median of x are calculated in each interval. It is these cross-medians to which a cubic spline is then fit.

Table 4. Ratios of Estimated (Mean) Wages.

Workers with an Interruption X Years Ago vs. Workers with No Interruptions	*Men*				*Women*			
	Specification 1	*Specification 2*	*Specification 3*	*Specification 5*	*Specification 1*	*Specification 2*	*Specification 3*	*Specification 5*
1	0.953	0.870	0.868	0.845	0.954	0.895	0.885	0.854
2	0.953	0.870	0.922	0.933	0.954	0.895	0.912	0.950
3	0.953	0.870	0.908	0.933	0.954	0.895	0.927	0.938
4	0.953	0.870	0.917	0.949	0.954	0.895	0.935	0.955

cially attached to the labor force. My sample spans a wider range of ages and uses more complete data. Confining the analysis to the younger workers in my sample produces results similar to those reported for my whole sample: the Basic Work History Model continues to yield lower returns to experience than the other specifications after about 12 years of experience has been accumulated. In addition, the three studies use three different models. Notably, Kunze's model took the reason for the interruption into account, which may be why she found differences between the sexes, whereas Light and Ureta and I do not. One important common finding of all three studies is that measuring an individual's experience in a more detailed fashion than simply with a cumulative measure appears to be important at higher experience levels. At low levels of experience, a cumulative measure provides just as much information.

To further investigate the effect of interruptions, in Table 4 I present some calculations based on the various estimates presented above. More specifically, Table 4 presents the wages of workers who experienced an interruption last year, 2 years ago, 3 years ago, and 4 years ago relative to the wages of workers who worked continuously. The calculations assume that workers were five years into their working lives during the 1980s. Specification 1, the Basic Mincer Model, allows for an interruption only in the sense that a year of experience is foregone. Specification 2 takes cumulative nonemployment time into account, but the return to an interruption is the same no matter when the interruption occurs. Intuitively, however, the penalty associated with a given interruption should decline over time, and Specification 3, the Segmented Model with Interruption Dummies, and Specification 5, the Basic Work History Model, allow for that possibility.

For men, the loss in earnings upon returning to work ranged from about 13% to almost 16% depending on whether Specification 3 or Specification 5 is considered, but wages had rebounded to a great extent after just one year. For women, the penalty upon returning to work ranged from almost 12% to almost 15%. In addition, the relative wage rebound over four years was the same for both sexes under Specification 3,[4] but it was slightly quicker for men under Specification 5. This is consistent with the point made in the previous discussion that although women are not penalized as much as men for a given interruption, the effect of their interruptions persists longer.

An Application of the Work History Model: Wage Gaps and Employment Expectations

Estimating alternatives to traditional Mincerian wage equations is certainly use-

[4]The rebound is slower for women than for men when workers with more years of experience have interruptions further in the past than four years, which is consistent with the previously reported finding of this analysis that more past interruptions mattered for women than for men.

ful for analyzing career interruptions, which unquestionably affect wages. However, when career interruptions are not the explicit topic of study, are their wage effects large enough to justify supplementing traditional Mincerian wage equations? Light and Ureta applied their work history specification to an analysis of the earnings gender gap. They decomposed the gender wage gap into the portion due to differences in returns to experience and the portion due to timing of experience by comparing the wages of men and women with equal amounts of experience, using a procedure similar to that proposed by Blinder (1973) and Oaxaca (1973).

First, Light and Ureta calculated the wage gap due to differences in the returns to *and* timing of experience by multiplying each person's values for the fraction of weeks worked by the coefficients for his or her gender and then subtracting the women's average log wage for a particular experience category from the men's average for the same experience category. This was decomposable into a portion due solely to timing and a portion due solely to returns. The wage gap due solely to timing was calculated by multiplying the fraction of weeks worked for all individuals by the coefficients from the male regression and then subtracting the women's average from the men's average. Light and Ureta found that the observed wage gap between men and women averaged about 40% across experience categories. The gap due to timing *and* returns between men and women ranged from about 10% to 28%, depending on the experience level. The gap due solely to timing ranged from less than 1% to about 6%; while these percentages are small, they accounted for 20% to 30% of the total experience gap (due to both timing and returns) for most experience groups.

My replication of this procedure yields slightly different results, as can be seen in Table 5. Workers had up to 22 years of experience in the sample, and the wage gap estimated by Specification 5, the Basic Work History Model, ranges from 13% to 20%, depending on the amount of experience acquired. It is not surprising that the total gender wage gap is smaller than Light and Ureta found, as their sample spanned an earlier time period, 1968–81. The wage gap due to both timing of and returns to experience ranges from a negligible amount to over 5%. This suggests that the vast majority of the gender wage gap in my sample was accounted for by differences in mean endowments of the other explanatory variables and the returns to these endowments. For almost all experience groups, about 20% to 25% of the total estimated wage gap is accounted for by the timing of and returns to experience. Light and Ureta, in contrast, found that for most experience groups, almost 50% of the total gap was due to the timing of and returns to experience.[5] The wage gap due solely to the timing of experience in my sample is very small, ranging from 0.6% to over 2%. However, between 18% and 50% of the gap due to timing and returns is explained by timing, which is comparable to the range found by Light and Ureta.

Light and Ureta's findings lead one to question the automatic use of the Mincerian wage equation that pervades labor economics, and my findings corroborate this concern to a lesser degree. While the estimated portion of the total gap explained by both the timing of and the returns to experience is larger in Light and Ureta's study than in the present one, the two studies show that a similar portion of the timing and returns gap is accountable to the timing of experience alone.[6]

[5]As with any wage gap decomposition, caution must be taken when interpreting the results. The effect of changes in individual coefficients used in the decomposition on the gender gap depends not only on how the variables are measured but also on the assumption that all of the other coefficients remain unchanged. Another possible reason for the difference, one might surmise, is that Light and Ureta's sample was slightly younger than mine. However, when I repeat this procedure for a sample similar to theirs, I find that for most experience groups less than 20% of the total wage gap is explained by timing and returns.

[6]An analysis of the earnings gap between women without children and women with children, presented in Table A2, yields slightly different results. The

Table 5. Decomposition of the Gender Wage Gap.

Years Experience	Total Estimated Gap (1)	Gap Due to Timing and Returns (2)	Gap Due to Timing (3)	Column (3) as a Percentage of Column (2) (4)	No. Observations Men	No. Observations Women
0	0.127	0.000	—	—	1,867	1,968
1	0.144	0.016	0.006	0.348	2,824	2,945
2	0.157	0.028	0.007	0.253	2,782	2,868
3	0.171	0.037	0.010	0.279	2,713	2,797
4	0.186	0.046	0.014	0.313	2,636	2,663
5	0.189	0.048	0.011	0.239	2,546	2,522
6	0.195	0.050	0.013	0.253	2,455	2,374
7	0.190	0.043	0.010	0.243	2,363	2,219
8	0.197	0.049	0.014	0.283	2,244	2,061
9	0.194	0.045	0.013	0.278	2,116	1,877
10	0.193	0.044	0.013	0.301	1,945	1,676
11	0.202	0.054	0.022	0.408	1,787	1,453
12	0.188	0.046	0.014	0.295	1,565	1,290
13	0.195	0.050	0.018	0.356	1,413	1,112
14	0.184	0.044	0.011	0.244	1,191	912
15	0.196	0.046	0.012	0.274	1,009	734
16	0.187	0.043	0.010	0.224	827	604
17	0.198	0.041	0.007	0.180	599	438
18	0.197	0.046	0.012	0.270	572	391
19	0.199	0.038	0.004	0.115	364	230
20	0.203	0.041	0.007	0.172	313	198
21	0.202	0.035	0.001	0.037	144	78
22	0.170	0.035	0.001	0.027	154	70
0–22	0.200	0.058	0.030	0.516	36,429	33,480

Note: Observations are grouped based on years of work experience accumulated, rounded to the nearest whole number.

The Role of Career Expectations

Another potential problem with comparing wage equations between the sexes and calculating wage gaps is the lack of consideration for career expectations, and exploring this topic seems a natural extension of this study. Perhaps women's returns to experience are lower than men's because their career interruptions are expected to a greater degree than men's, and hence women invest less in human capital. If the currently estimated returns to the fraction of weeks worked are underestimated for women because of a failure to take career expectations into account, then the portion of the gap due to timing will be understated, while the portion due to returns alone will be overstated. Human capital theory predicts that individuals who expect interruptions will have slower wage growth than those who are employed continuously or who experience unanticipated interruptions. They are willing to accept this slower wage growth in return for a higher initial wage. Thus, if expectations about future interruptions affect current decisions about human capital investment, the interaction of a variable indicating the extent of future career interruptions with current experience will have a negative coefficient, while including the variable by

timing effect again explains a very small portion of the overall gap, and for most experience groups it explains a smaller portion of the gap due to timing and returns than it does for the gender gap decomposition. Holding the amount of experience constant, the returns to experience explain most of the total gap between mothers and non-mothers. Again, however, caution must be exercised in interpreting detailed wage decompositions.

itself will result in a positive coefficient.

The question of whether a future planned interruption will have an impact on current earnings growth has been discussed at length (see, for example, Polachek 1975; Weiss and Gronau 1981), but few attempts have been made to determine the impact empirically. No study has been able to make full use of panel data, and none has looked at both men and women. Sandell and Shapiro (1979) used a variable from the National Longitudinal Surveys of Young Women (NLSYW) indicating what an individual expected to be doing at 35 years of age as of the start of the survey in 1968. They estimated a cross-sectional wage equation that included a dummy variable equal to one if a woman planned to work at age 35 and interaction terms for work experience and plans to work, and their results supported the human capital hypothesis. However, their wage equations did not incorporate time spent out of the labor force, just work experience; thus, it may be that these interaction terms were capturing the effects of time spent out of the labor force.

Cox (1984) used data from the 1973 Current Population Survey and the 1937–73 Social Security Longitudinal Earnings Public Use File to estimate segmented earnings functions for women, interacting a future interruption with current experience. He restricted his study to women who experienced either no interruptions or one interruption at most, which neglected a large number of individuals and resulted in a small sample size. Nevertheless, his results partially supported the human capital hypothesis. Earnings growth in general was lower if a future work interruption existed, but relatively longer future career interruptions were associated with a slightly higher rate of earnings growth early in the life cycle.

My analysis, presented in Table 6, includes both men and women. For each year, I calculate the fraction of future years spent not working, FutIntrp, and interact this variable with current work experience. Specification 2 with Expectations is an extension of the Basic Segmented Model. As human capital theory predicts, the coefficient on FutIntrp is positive and statistically significant for both sexes, but the magnitude is larger for men. This suggests that women did not require as high an initial wage to compensate them for slower wage growth prior to an interruption. Moreover, the interaction between FutIntrp and experience has negative coefficients in both decades. The absolute magnitudes of the coefficients are similar across the sexes, but relative to the return to experience, women faced slower wage growth prior to interruptions. In addition, the interaction terms are more statistically significant for women; in fact, the interaction term for men in the 1980s is insignificant. This is consistent with women being more likely than men to expect future interruptions. Controlling for expectations does not significantly affect the returns to experience for either sex, suggesting that there are other explanations for the return to experience for women being lower than that for men. Again, one possibility is employer discrimination.

Specification 5 with Expectations is an extension of the Basic Work History Model. The fraction of weeks worked n years ago, for example, is interacted with the value of FutIntrp n years ago in order to measure what an individual's career expectations were n years ago. Now the coefficient on FutIntrp is not statistically significant for women, but it is still positive and statistically significant for men. This is more extreme than the result from Specification 2, suggesting that women did not require any compensation for slower wage growth due to future interruptions. The coefficients on the interaction terms, while mostly negative for both sexes, are statistically significant only about half of the time.

Because of the unwieldy nature of this specification, I am hesitant to place much emphasis on these results. It is interesting to note, however, that the returns to past experience again do not increase once an attempt is made to control for career expectations. This suggests that the portion of the gender gap due to timing is not understated because of a failure to take career expectations into account.

Table 6. Selected Fixed Effects Estimates of Wage Equations Using Expectations Measures, 1979–2000.

	Men				*Women*			
	Specification 2 with Expectations		*Specification 5 with Expectations*		*Specification 2 with Expectations*		*Specification 5 with Expectations*	
Independent Variable	*Coefficient*	*t-stat*	*Coefficient*	*t-stat*	*Coefficient*	*t-stat*	*Coefficient*	*t-stat*
FutIntrp	0.468***	4.5	0.166***	4.2	0.243***	4.2	–0.019	–0.8
FutIntrp*Exp '80s	–0.024	–1.1			–0.026**	–2.0		
FutIntrp*Exp2 80s	–0.001	–0.2			0.000	0.2		
FutIntrp*Exp '90s	–0.040***	–2.8			–0.036***	–4.2		
FutIntrp*Exp2 90s	0.000	0.4			0.001**	2.3		
Exp '80s	0.102***	28.7			0.083***	22.3		
Exp^2 80s	–0.005***	–14.7			–0.003***	–8.7		
Exp '90s	0.055***	18.5			0.047***	17.6		
Exp^2 '90s	–0.001***	–10.2			–0.001***	–8.6		
Nonemp '80s	–0.073***	–8.7			–0.057***	–9.6		
Nonemp^2 '80s	0.009***	7.3			0.005***	6.8		
Nonemp '90s	–0.034***	–5.3			–0.042***	–11.1		
Nonemp^2 '90s	0.003***	6.2			0.003***	11.1		
FutIntrp1*FrcWksWrkd1			–0.148***	–3.6			0.054**	2.1
FutIntrp2*FrcWksWrkd2			0.006	0.2			–0.010	–0.4
FutIntrp3*FrcWksWrkd3			–0.119***	–2.8			–0.055*	–1.9
FutIntrp4*FrcWksWrkd4			–0.102**	–2.2			–0.055*	–1.7
FutIntrp5*FrcWksWrkd5			–0.071	–1.5			–0.068**	–2.0
FutIntrp6*FrcWksWrkd6			–0.008	–0.2			–0.032	–0.9
FutIntrp7*FrcWksWrkd7			–0.122**	–2.3			0.001	0.0
FutIntrp8*FrcWksWrkd8			0.041	0.8			–0.057	–1.5
FutIntrp9*FrcWksWrkd9			–0.024	–0.4			–0.070*	–1.8
FutIntrp10*FrcWksWrkd10			–0.166***	–2.9			–0.094**	–2.4
FutIntrp11*FrcWksWrkd11+			–0.072	–1.2			–0.035	–0.9
FrcWksWrkd1			0.170***	17.4			0.132***	14.4
FrcWksWrkd2			0.063***	8.9			0.046***	6.5
FrcWksWrkd3			0.075***	8.1			0.068***	7.8
FrcWksWrkd4			0.060***	6.1			0.051***	5.5
FrcWksWrkd5			0.044***	4.4			0.040***	4.1
FrcWksWrkd6			0.038***	3.7			0.034***	3.5
FrcWksWrkd7			0.028***	2.8			0.033***	3.3
FrcWksWrkd8			0.028***	2.6			0.032***	3.1
FrcWksWrkd9			0.019*	1.8			0.037***	3.5
FrcWksWrkd10			0.030***	2.8			0.037***	3.5
FrcWksWrkd11+			0.079***	8.2			0.070***	7.2
R^2 Within	0.273		0.276		0.239		0.245	
No. Observations	36,429		36,429		33,480		33,480	

Note: The remainder of the explanatory variables are the same as in previous regressions. Full results are available from the author upon request.

*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

Of course, it is important to remember that this analysis uses an *ex post* measure of expectations, which assumes that individuals correctly anticipate future interruptions. An *ex post* measure of expectations is certainly not perfect, but it is the most practical approach given data limitations. More specifically, the measure used here assumes that individuals correctly anticipated how much interruption time they would experience in the future, not just whether an interruption would occur. It seems reasonable to suppose that a worker is able to correctly predict more than just the existence of any future interruptions. Nevertheless, it is encouraging that other specifications with simpler measures of expectations (not presented here), such as whether an interruption of at least a year occurs in the future, yield similar general conclusions. Taken together, the results suggest that future career interruptions do affect current wages and are expected to some degree for both sexes, probably more so for women than for men.

Conclusion

This study finds that total nonemployment time has a statistically significant depreciation effect on wages, which corroborates past findings. Previous literature, however, has been divided as to whether any given interruption, especially the most recent interruption, matters. Researchers estimating wage change equations in the 1970s and 1980s failed to come to a consensus. More recent studies have found that only interruptions occurring in the past few years matter. This paper, using data that are more complete and span a longer time period than the data used in previous studies, finds that, while more recent interruptions mattered, past interruptions and ones that occurred at the very beginning of an individual's career also mattered. It also finds that wage losses associated with nonemployment were less severe for women than for men, although more past interruptions seemed to matter for women than men. In addition, once the timing of an individual's work experience has been taken into account, I find that little further penalty is associated with long periods of nonemployment. In these data, the timing of experience explains a very small percentage of the gender wage gap, and controlling for career expectations does not change this result. However, career expectations did affect current wages for both men and women to some extent, though there is limited evidence suggesting that women's interruptions were more anticipated.

When career interruptions are not the focus of study, it is not clear whether estimating traditional Mincerian wage equations is justified. However, this study indicates that such estimations are less problematic than previous ones, like Light and Ureta's. It is beyond the scope of this paper to investigate whether depreciation effects vary with type of interruption, but such a study might provide insight into why the wage losses of interruptions vary by sex. It might also be useful in exploring the respective roles of human capital, signaling, and job mismatch theories in individuals' work histories.

Appendix Table A1
First and Last Wage Change Equations for Women, 1979–1998

Change in Independent Variable	*Coefficient*	*t-stat*
Cumulative Experience Measures		
Total Experience	0.031**	2.2
Change in Total Experience^2	–0.001	–0.8
Total Nonemployment	–0.038***	–2.7
Total Nonemployment^2	0.002*	1.7
Years Schooling	0.104***	13.4
Years Tenure	0.014***	4.5
Constant	–0.022	–0.3
Adjusted R^2	0.231	
No. Observations	2,012	
Segmented Experience Measures		
No Interruption	0.087	0.7
Previous Experience	0.010**	2.0
Previous Nonemployment	–0.008	–1.0
Most Recent Nonemployment	0.021	0.8
Most Recent Nonemployment^2	–0.002	–1.0
Post Experience	0.054***	3.9
Post Experience^2	–0.001	–1.6
Total Experience*No Interruption	0.041**	2.2
Total Experience^2*No Interruption	–0.001	–1.2
Years Schooling	0.102***	13.2
Years Tenure	0.010***	3.1
Constant	–0.117	–1.4
Adjusted R^2	0.243	
No. Observations	2,012	

Note: No Interruption = 1 if worker never experienced a career interruption.
*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

Appendix Table A2
Decomposition of the Wage Gap Between Mothers and Non-Mothers

Years Experience	*Total Estimated Gap*	*Gap Due to Timing and Returns*	*Gap Due to Timing*	*Column (3) as a Percentage of Column (2)*	*No. Observations*	
	(1)	*(2)*	*(3)*	*(4)*	*Non-Mothers*	*Mothers*
0	0.058	—	—	—	1,522	446
1	0.111	0.040	0.032	0.822	2,087	858
2	0.107	0.040	0.020	0.509	1,892	976
3	0.123	0.066	0.032	0.481	1,707	1,090
4	0.133	0.081	0.031	0.387	1,489	1,174
5	0.132	0.091	0.027	0.295	1,311	1,211
6	0.132	0.100	0.022	0.219	1,159	1,215
7	0.142	0.111	0.018	0.161	971	1,248
8	0.158	0.136	0.026	0.187	851	1,210
9	0.178	0.153	0.027	0.175	717	1,160
10	0.186	0.171	0.028	0.166	603	1,073
11	0.193	0.185	0.037	0.198	494	959
12	0.189	0.182	0.028	0.156	412	878
13	0.192	0.182	0.027	0.150	351	761
14	0.175	0.176	0.018	0.100	258	654
15	0.173	0.183	0.024	0.129	217	517
16	0.156	0.171	0.008	0.045	176	428
17	0.151	0.164	0.000	—	132	306
18	0.165	0.173	0.007	0.040	116	275
19	0.145	0.162	—	—	72	158
20	0.161	0.173	0.003	0.016	61	137
21	0.146	0.166	—	—	28	50
22	0.158	0.174	—	—	22	48
0–22	0.038	0.014	—	—	16,648	16,832

Note: Observations are grouped based on years of work experience accumulated, rounded to the nearest whole number.

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