Unemployment Scarring by Gender: Human Capital Depreciation or Stigmatization? Longitudinal Evidence from the Netherlands, 1980-2000

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ABSTRACT

Much theoretical controversy surrounds the question of what drives unemployment scarring by gender: human capital depreciation or stigmatization? Using a comprehensive longitudinal dataset from the Dutch Labor Supply Panel for 1980 through 2000, our results reveal that wage penalties from unemployment are *not* skewed along lines of gender. Our analysis shows that unemployment-scarring effects exacerbate with ethnicity and, in particular, during economic downturns, although only among male workers 35 to 50 years of age. This study is one of the few that provides evidence that for women the effects of unemployment scarring are driven mainly by human capital depreciation, while for men stigma effects dominate.

INTRODUCTION

In the last three decades various studies have made important contributions to the understanding of the processes that generate long-term wage setbacks, also known as 'unemployment scarring' (DiPrete 1981; DiPrete and McManus 2000; Gangl 2004, 2006; Gregg 2001; Jacobson et al. 1993; Kuhn 2002; Moore 2010). Two competing explanatory mechanisms for unemployment scarring have been proposed: human capital depreciation and stigmatization. Drawing upon human capital theory (Becker 1964), the first explanation provides a theoretical account for the enduring negative wage effects from a supply-side perspective. Specifically, the human capital explanation argues that loss of human capital during periods of unemployment reduces workers' productivity and leads to lower post-unemployment wages subsequently (Gregg 2001; Ruhm 1991; Stewart 2000; Mühleisen and Zimmermann 1994). Stigma (or signaling) theory (Spence 1973) provides an alternative to this explanation from a demand-side perspective. With reference to how employers' make their hiring decisions, signaling theory hypothesizes that unemployment periods are interpreted as signals of low productivity and low commitment that lead to less secure and lower paid job-offers (Arulampalam 2001; Arulampalam et al. 2000; Correll et al. 2007; Gregory and Jukes 2001; Jacobson et al. 1993; Omori 1997; Stevens 1997).

Although important progress has been made, theoretical and empirical challenges remain. First, while existing studies provide conclusive evidence on *whether* unemployment scars, they still fall short in explaining *why* unemployment scars. More specifically, how do we know when unemployment scarring arises due to stigma effects or when it arises due to human capital depreciation effects? With exception of Omori

(1997) and more recently Correll, et al. (2007), no earlier unemployment scarring studies have made convincing attempts to disentangle stigma effects from human capital effects.

Second, earlier studies have shown that the negative impact of unemployment on workers' subsequent wages can be attributed to a number of different dimensions of unemployment, in particular, its occurrence, duration and repetition. These dimensions may each independently influence workers' post-unemployment wages, and in different ways. Yet, while the separate dimensions of unemployment have been extensively examined, surprisingly little is known about *how much* the combined effect of these dimensions damages workers' post-unemployment wages.

Third and finally, existing work on unemployment scarring – which is largely from the United States – has mainly focused on working men. Are women and men of different ages equally disadvantaged by episodes of unemployment and, if so, do the studies to date reflect a universal impact of unemployment scarring? The United States may be a unique case because of its relatively high labor market mobility, comparatively weak employment protection and high income inequality (DiPrete 1981; Müller and Gangl 2003) which may make men and women more vulnerable to unemployment scarring in the form of stigma (i.e., because workers depend more directly on employers' hiring decisions). A question that needs to be addressed further is to what extent unemployment scarring works out differently among men and women of different ages in countries with contrasting employment protection and parental leave systems.

In the present study, we focus on these three issues. First, we address *why* unemployment scars by comparing the two competing explanatory hypotheses for unemployment scarring: human capital depreciation and unemployment stigma

hypotheses. Similar to Omori (1997), we argue that if stigma drives unemployment scarring, then scarring effects should exacerbate in specific (tight) labor market situations and among specific (disadvantaged) groups (e.g., age, parenthood and ethnicity groups). By contrast, little or no contextual variation would indicate that human capital depreciation effects dominate. The aim of this approach is to disentangle stigma from human capital depreciation effects, which has been less common in existing literature. At the same time it allows us to examine when, and for which social groups, unemployment stigma effects dominate human capital depreciation effects.

Second, we address *how much* unemployment scars by including multiple dimensions of unemployment – previous unemployment occurrence, repetition and duration – to investigate how each influences men's and women's post-unemployment wages. We then combine these three dimensions into a single 'unemployment index' by which the *full magnitude* of unemployment effects is measured. This approach provides a comprehensive and statistically powerful perspective on the unemployment scarring effects, while at the same time it introduces a tool for other studies that seek to compare unemployment scarring across different countries.

Third, we examine gender differences in unemployment scarring in the Netherlands over the period of 1985-2000. Several aspects differentiate the Netherlands from the United States such as the high share of women working in part-time jobs, high employment protection, and job guarantee for mothers (and fathers) to return to the labor force after a temporarily interrupted employment career. Our research may provide contrasting insights into whether the gender wage gap generally increases with unemployment and/or in an advanced interventionist welfare regime.

We use a rich and comprehensive longitudinal dataset, the Netherlands Labor Supply Panel (OSA), which covers the period 1980-2000 with a biannual panel design. The panel structure of the data and its explicit definition of unemployment among men and women (explicitly ruling out other forms of non-participation in paid work) allows us to identify the multiple dimensions of unemployment and examine gendered unemployment effects more effectively than earlier studies. More importantly, the data includes rich information on labor market and demographic situations, which provides us with an excellent opportunity to disentangle stigma from human capital effects.

The analytical strategy in our study is to compare two equivalent groups of workers who differ only with respect to their route into employment: one group came into employment via a spell of unemployment and the other group via employment. We use fixed-effects panel models that correct for time-constant unobserved heterogeneity to analyze the effects of unemployment and to disentangle human capital depreciation from stigma effects on men's and women's post-unemployment wages.

PREVIOUS LITERATURE ON UNEMPLOYMENT SCARRING

In recent years, a considerable debate has arisen about the role played by trigger events (i.e., disruptive life-course events such as child-birth, divorce, job-displacement and unemployment) in generating enduring patterns of inequality in the labor market (Budig and England 2001; DiPrete and McManus 2000; Gangl 2004, 2006). This rapidly growing body of research suggests that trigger events, in general, and unemployment, in particular, lead to highly negative and long-lasting scars in workers' employment careers and post-unemployment wages. Early empirical evidence on unemployment scarring

comes from studies conducted in the US, where significant re-employment wage penalties range from 15 to 25 percent (Jacobson, LaLonde and Sullivan 1993) amongst once-displaced workers compared to a situation without such an interruption.

However, this literature offers conflicting evidence whether the danger of unemployment lies primarily in its *first* occurrence or in unemployment *re-occurrence(s)* over time, particularly. For instance, Jacobson, LaLonde, and Sullivan (1993), who used administrative data on Pennsylvanian workers and their firms (1974-1986), demonstrate that a *single occurrence of unemployment* leaves significant scars on post-unemployment wages even five years after the job loss. According to Stevens (1997), who used panel data from the US Panel Study of Income and Dynamics (PSID) 1968-1988, the key driving force behind these long-lasting wage penalties is the *number of earlier unemployment episodes* that inhibit workers' recovery trajectories. In line with this evidence, Gregory and Jukes (2001) find a persisting negative effect on workers' re-employment wages, arising from re-occurring unemployment periods, or as we call it in this study *unemployment repetition*. Interesting evidence follows from the study of Arulampalam, Booth, and Taylor (2000) who – using data from the British Household Panel Data (BHPS) – show that especially the *first* employment interruption carries the highest re-employment wage penalties compared to latter interruptions.

More recent empirical evidence shows that unemployment scarring effects may work differently for different social groups and in different contexts. For instance – using the same PSID data –DiPrete and McManus (2000) find that, in general, unemployment reduces household earnings, but that these negative effects alleviate over time as result of counterbalancing effects that arise from subsequent employment episodes. In addition,

Gangl (2004, 2006) who compares the magnitude of unemployment scarring between US and German workers finds that wage penalties arising from previous unemployment become less dramatic when institutional support in the form of unemployment benefits is provided. In particular, this study demonstrates that German workers supported by unemployment benefits experience much lower and more temporary wage losses compared to their, otherwise equivalent, US counterparts.

These empirical findings suggest that different dimensions of unemployment entail different negative effects on workers' subsequent wages. These effects have different implications for different social groups and may also alleviate when followed by counterbalancing employment periods or when supported by institutions. In this study, we complement these existing studies by examining these dimensions separately and combined and by disentangling when and why unemployment scars. In what follows we use arguments from different labor market theories to derive the mechanisms that cause unemployment scarring.

THE GENDERED MECHANISMS OF UNEMPLOYMENT SCARRING

The theoretical literature on unemployment scarring has pointed out two key competing mechanisms that explain unemployment scarring, namely: (1) loss and depreciation of (non)transferable human capital, and (2) reduced bargaining power as result of unemployment stigma. We expect that these competing mechanisms may work out differently across gender because of differences in the accumulation of human capital and differences in the opportunity structures of men and women.

In particular, the first mechanism emphasizes that workers' wage losses after a spell of unemployment are related to changes in their human capital (Becker 1964, 1993). Theory suggests that human capital can be divided into a *generic* part, which is acquired through education and is transferable across employers, and a *specific* part, which is acquired through experience and on-the-job training in a certain firm or sector and is non-transferable across employers (Becker 1993). For both men and women, a direct implication of this distinction is the expectation that interruption of specific on-the-job training may lead to lower levels of productivity, both instantaneously and in the long run. In particular, skills related to specific firms, sectors, or industries are lost when unemployment occurs. By contrast, generic human capital depreciates over longer spells of unemployment.

Recognizing that women's careers are more often characterized by work interruptions due to caring responsibilities, we anticipate that the process of human capital depreciation may be stronger among women than men. Especially in the Dutch context, there are two aspects that differentiate women's careers from that of men. First, part-time work is highly common in the Netherlands where 71.5 percent of Dutch women who were employed, three quarters were employed in part-time jobs in 2011 (CBS 2011). Although employment protection and job guarantees may free Dutch women from their caregiver roles, it does not protect them from the depreciation of their firm-specific human capital when they are out of labor. Second, women's careers in general and those of Dutch women, in particular, are often characterized by multiple career interruptions. Previous research has established that *the number of previous job losses* may also have a negative effect upon workers' human capital (Jacobson et al. 1993; Stevens 1997). These

authors argue that in cases of multiple job loss, workers don't have sufficient time to recover from the effects of unemployment because the recovery periods are interrupted by new and recurrent unemployment spells. This repeating process of human capital depreciation is extremely precarious as it may lead to "low-pay-no-pay" cycles (Gregg and Tominey 2004). Following the above mentioned arguments we expect that unemployment should reinforce existing gender wage penalties due to differences in workers' human capital depreciation effects. This leads to our first hypothesis:

Human Capital Hypothesis: More recent occurrence, longer duration, and repetition of unemployment have a negative effect on post-unemployment wages, which are higher among women than men, and run parallel to gendered differences in labor market experience.

Unemployment and Stigma across Social Groups and Labor Market Circumstances

Unemployment stigma is the most often cited competing explanation for unemployment scarring. According to signaling theory (Spence 1973), employers must use 'signals' when a direct evaluation of a worker's productivity is unavailable. Within a signaling framework, employers' hiring decisions are taken against a background of uncertainty about workers' productive capabilities. Whenever such uncertainty exists, employers rely on the observable characteristics of workers such as age, ethnicity, and family situation, but also their past employment history, all of which serve as a statistical screening device in the hiring process (Lockwood 1991; Eliason 1995).

Unemployment stigma may be revealed by gender when unemployed men and women are treated differently in the hiring process. Existing studies show that stigma, or the way in which employers judge or prejudge social groups, does not arise in a social vacuum, but that employers' judgment interacts with the cultural norms and social policies related to work within a given country (England 2005; Budig et al. 2011). From the perspective of our study, unemployment stigma would reflect employers' culturally produced notions about which gender is more likely to experience a certain type of job interruption (i.e., periods of child rearing or unemployment). In the literature, it is often assumed that the Netherlands is a country with a strong cultural norm of mothers working limited hours (Mills and Täht 2010). In fact, the Dutch 'Employment Miracle' – between 1985 and 1997 – was accompanied with an explosion of part-time jobs that fulfilled this cultural norm and marked the beginning of a new family model that was characterized by full-time working husbands and part-time working wives, also known as the 'one-and-a-half earner' breadwinner model (Mills and Täht 2010).

We anticipate that the expansion of the Dutch labor market with most women working part-time jobs also changed employers' norms towards working men and women. Specifically, while women were more often expected to take up a part-time job and experience more fragmented careers (due to childrearing), men were expected to have a full-time and continuous employment career (Mills and Täht 2010). If this is true, we can expect that having experienced unemployment during an employment career would be a more negative signal for men than women. Specifically, interrupted careers among men would be considered as deviations from the 'standard' career and therefore penalize the wages of previously unemployed male workers as potentially unproductive.

In sum, it should be expected that for men, wage penalties that remain after controlling for human capital differences, should be the product of stigma effects, while for women human capital depreciation effects should prevail.

We also anticipate that the strength of stigma effects may vary across social groups with disadvantageous labor market assets (i.e., older age, parenthood status, and/or minority ethnicity) or during tight labor market circumstances. We start with *age* as a potential stigmatizing characteristic. Existing studies find that a spell of unemployment that occurs when the individual is older increases the likelihood that (s)he will once again experience unemployment in the future and that this can have a stigmatizing effect in the case of older workers (Stevens 1997). According to an explanation proposed by Arulampalam (2001), employers expect younger workers (i.e., younger than 25 years old) to exhibit a pronounced 'job-shopping' behavior that may be characterized by short periods of unemployment. Such early-age spells of unemployment produce less of a stigma than older age spells. Other studies argue that age-related stigma is closely related to employers' attitudes towards return-to-investments in on-the-job training (Wolbers 2008). In particular, with the shorter periods of retraining in mind, employers would be more likely to hire younger workers who are less expensive and have acquired skills more adaptable for newly created jobs. In contrast, older workers who are often trained for more traditional occupations are expected to have general skills that are outdated and weaken their comparative advantage relative to younger workers in terms of work experience. As a consequence, employers are more likely to hire older workers in lower-paying jobs that don't require long periods of retraining on-the-job. Overall we expect that:

Stigma Hypothesis (2a). Workers who experience unemployment at older ages will experience stronger wage penalties compared to workers who experience unemployment at younger ages.

Interestingly, existing research confirms that employers' hiring decisions are strongly influenced by one's parenthood status (Budig and England 2001; Budig and Hodges 2010; Correll et al. 2007; Gangl and Ziefle 2009). An extensive literature suggests that employers discriminate in terms of hiring decisions, promotion opportunities, and wages against mothers, but not against fathers. According to Correll et al. (2007), employer discrimination against working mothers is related to the cultural understanding of the motherhood role. Especially in societies in which women are expected to take care of their children, employers – unconsciously – prejudge working mothers as less productive and less competent (Ridgeway and Correll 2004). It is especially this cultural expectation that leads to discrimination against mothers in hiring, promotion, and wage decisions. By contrast, 'good' fathers are expected to work hard and are seen as more committed to their work. Fathers therefore generally experience an advantage over men without children. A recent study by Budig and Hodges (2010) shows that the motherhood wage penalty varies in regards to the age(s) of the woman's children in the United States. Specifically, the study finds that the older the children, the higher the hourly wage penalty experienced by the mother, because of foregone human capital accumulation. The motherhood wage penalty is also highly present in the Netherlands where the penalty reaches almost 20 percent and is among the highest in Western societies (Misra et al. 2007). In this study, we extend this evidence by investigating

whether the combination of being unemployed *and* a mother exacerbates existing gender inequalities even further. We argue that mothers who experience unemployment may be doubly stigmatized by employers for not only being a 'bad' but also an 'unproductive' worker. Given the arguments above, this would not hold for fathers. In sum, we expect that:

Stigma Hypothesis (2b): Once unemployed, mothers will experience stronger wage penalties than fathers or women without children, over and above the loss of human capital, by reduced work experience.

Another characteristic that may negatively influence employer's hiring and wage decisions is a worker's ethnicity. If employers have little information about the productivity of an applicant from a specific ethnic group then employers may discriminate on statistical grounds. The uncertainty about the productivity of workers from minority groups creates an extra risk for the firm that becomes expressed in the form of wage differences between native and ethnic applicants. In this study we extend this literature (Borjas 1994; 1999; Nielsen et al. 2004) by testing whether stigma effects related to unemployment are stronger among non-natives than among native applicants. We assume that a previous unemployment episode for non-natives will invoke the stereotype that applicants from minority groups are less productive and more vulnerable to recurrent unemployment periods. This will lead to higher wage penalties between natives and non-natives over time. We therefore expect that:

Stigma Hypothesis (2c): Previously unemployed non-native workers will suffer stronger wage penalties than native workers because of the loss of work experience effect.

Stigma effects from unemployment may also vary with the business cycle. In times of economic downturn, with high unemployment rates and few open vacancies, the probability of finding a job decreases. Following arguments from the economic literature, a spell of unemployment incurred during a recession can be regarded less of a negative signal to a firm than one experienced during an economic upturn (Blanchard and Diamond 1994; Lockwood 1991). When screening job applications employers will attribute the occurrence of unemployment during economic downturns to firm closures and reorganizations rather than to workers' lack of motivation or performance. Consequently, if stigma effects exist unemployment scarring should be higher when unemployment is encountered during periods with lower unemployment rates than in periods with higher unemployment rates. This argument builds upon two assumptions. Following these arguments we posit that:

Stigma Expectation (2d). Previously unemployed workers will suffer more severe wage penalties when their unemployment occurred during economic upturns compared to workers who remained in continuous employment, or experienced unemployment in tight labor market conditions.

DATA, MEASURES AND METHODS

Data and effective sample

The data for our study come from the Netherlands Labor Supply Panel (OSA). The OSA is a panel study that is continually refreshed and is targeted at a representative sample of 4,000 to 5,000 respondents in each wave. The first wave was interviewed in 1985 (with a retrospective component reaching back to 1980) and then re-approached in 1986 with further biannual waves until 2000. Panel attrition over the nine waves (around 39%) was compensated by adding fresh respondents using a sampling design that was stratified by region, gender, age, and education (NIWI 2000). The data includes a wealth of information about respondent's family background, education, and incomes. In particular, in each wave, the current earnings situation of the respondent was examined.

Moreover, the data provides detailed information about respondent's labor market situation, including start and end dates, of all unemployment episodes, making it possible to trace transitions in a dynamic way. To be included in our analysis, respondents had to be between 21 and 54 years old, be employed at the moment of interview, and have had to report positive earnings in a given wave. We also excluded wage observations in the bottom 1st percentile (N = 235), which are likely to be produced by measurement problems and can be influential. Finally, we excluded those workers who lost their jobs due to self-owned business failures or other reasons (N=33) as their job loss contradicts the definition of unemployment as an involuntary event resulting from exogenously determined firm decisions.

Given these requirements, we start with a sample containing 18,082 wage observations over 7,734 workers. In order to apply fixed-effects modeling (which we will

explain in the next section in more detail) we need at least two wage observations per worker. This means that workers with less than two wage observations are dropped from our analyses leaving us with an effective sample of 11,569 valid wage observations over 5,024 workers, which is an average of 2.3 wage observations for each individual worker. From the total number of 5,024 workers, 3,385 (containing 7,970 wage observations) were continuously employed over the entire observation period and 1,639 (containing 3,599 wage observations) experienced unemployment either at the time of interview or between the two interview dates. In Table 1A of Appendix A, we show the distribution of at least two consecutive wage observations from the second wave (in 1986) and onwards.

To identify *unemployment episodes* in our data we have followed a two-step approach. First, we have used each respondent's reported labor force status at the date of interview, distinguishing between (1) employed, (2) self-employed, (3) unemployed, (4) non-participating, (5) in military service and (6) in education. Unemployment is explicitly defined in the questionnaire as "*currently out of labor and searching actively for a job*". Second, the OSA survey asks respondents to report the start and end dates of any change in labor force status that occurred between the current and last interview date. Using this retrospective information, we can record all unemployment spells that occurred between two interview dates.

In Figure 1, we show the distribution of age at first unemployment spell among the unemployed only. This figure indicates the presence of two groups of unemployed men and women. First, we have a group of men *and* women who experience their first unemployment instance around their 20s and 30s, at which point a higher proportion indicates possible mismatches between their attained education and their labor force

entry. Second, we find a group of women who experience their first unemployment spell in their mid-30s or 40s, which is likely to be related to fertility and child-rearing periods. Official statistics for the Netherlands confirm that a substantial share of women experience unemployment after childbirth in which they temporarily withdraw from the labor market and re-enter again into part-time jobs when children enter elementary school (OECD 2011).

FIGURE 1 ABOUT HERE

Measures

Post-unemployment wages. In this study, the dependent variable is the *log of hourly wages* at time *t* for individual *i,* excluding overtime pay and overtime hours. This variable is constructed by dividing the monthly net wages by the hours of work and then taking the logarithm, which is a standard indicator also used in other studies that estimate scarring effects (Gregory and Jukes 2001; Arulampalam et al. 2000). To harmonize the units of measurement, we have divided hourly wages by the mean of hourly wages in each particular wave.

Measuring unemployment. To test the expectations about the scarring effects of unemployment, we have constructed the following indicators. *Recent unemployment occurrence* is measured by constructing a lagged binary unemployment variable, which takes the value of 1 if the worker was unemployed in the previous wave and 0 if (s)he was continuously employed. *Unemployment duration* refers to the most recent unemployment spell, which is measured by taking the difference between the start and end period of the most recent unemployment spell. To ease interpretation we divided the

variable by 12 to convert from monthly into yearly duration. *Unemployment repetition* is measured by counting the number of unemployment episodes over the entire observation period. To disentangle the effect of multiple unemployment episodes from the effect of a first unemployment spell we have constructed an indicator variable for the *first unemployment*, which takes the value of 1 if a worker's unemployment spell in the previous wave was his or her first unemployment spell. The reference category refers to those in continuous employment.

To capture the combined effects of these unemployment indicators, we have also constructed an '*unemployment index*'. To do so, we have first standardized the individual unemployment indicators to have a mean of 0 and a variance of 1 (for men and women combined). We then averaged the four standardized unemployment indicators into a single summative[1] index. This index indicates the extent to which one has been unemployed. For the ease of interpretation we rescale the index into a 0..1 variable such that 0 pertains to those in continuous employment and 1 refers to those with the highest extent of unemployment. The values in-between indicate various combinations between the different indicators. For instance, a value of 0.18 indicates a person who had a first unemployment record in the previous wave while 1 indicates a repeatedly unemployed worker in the previous wave with a relatively long unemployment spell (i.e., 69 months). In Figure 1A of Appendix A, the kernel distribution of the rescaled unemployment index (only for those who experienced unemployment) is shown for men and women separately. Interestingly, the figure shows that in general women experience more often unemployment spells than men. In particular, there is a large share of women with a relatively low unemployment index suggesting interrupted careers of shorter spells or

single unemployment spells. However, the share of men and women with a high unemployment index is also evident in our sample.

Measuring human capital. To capture workers general skills we construct a time-varying measure for *education* that refers to the level of education attained by each individual at the time of interview. This variable distinguishes between five levels: (1) elementary education [LO]; (2) lower intermediate education [VBO-MAVO]; (3) higher intermediate secondary education [MBO-HAVO-VWO]; (4) vocational college [HBO] and (5) university degree [WO]. To capture the loss of specific human capital we construct the variable years of *tenure* with the former employer. The information is based on workers reported start and end dates of employment spells that occurred between the interview dates. Since the variable measures the foregone skills with the former employer we expect a negative relationship with re-employment wages. Using the four-digit occupation we construct a time-varying dummy variable for *same occupation* that indicates whether the former and current occupation were the same and 0 if otherwise. This should capture the retention of occupation specific skills and should be positively associated with re-employment wages. *Age* in years is included as a proxy for work experience and the variable *age squared* is included to examine the curvilinear relationship between accumulation of work experience and re-employment wages.

Measuring stigma. We uncover stigma effects by examining interactions of unemployment index with whether or not unemployment was experienced in tight labor markets (=1 if unemployment rate at year of unemployment is above the average unemployment rate and 0 if otherwise), whether unemployment scarring effects exacerbate during old age (=1 if first unemployment occurred at the age of 45 and older

and 0 if otherwise). We also examine interactions with whether any differences in the wage penalties result from ethnic differences (1= non-native, 0=native). The information is derived from workers country of birth. Finally, we explore interactions of the unemployment index with whether or not children are present in the household. To do so, we create a measure for parenthood indicating the presence of home-living children (0 = no children; 1 = home-living children; 2 = children, but not home-living).

Control variables. We also control for various job-related characteristics that may influence re-unemployment wages such as the *number of working hours* (ranging between 12 and 40); *type of contract* (1 = permanent and 0 = temporary contracts); *sector* (1 = public and 0 = private) and the *payment period* (1 = per year; 2 = per month; 3 = per four weeks; 4 = per weeks). Finally, to check period and business cycle effects, we include a variable indicating the *annual rate of unemployment* separately for men and women as reported by Statistics Netherlands (2010)[2]. Since we expect men and women to differ in their labor market experiences and to have different labor market behaviors, we have conducted the analyses for men and women separately. A detailed description of the variables by unemployment status is provided in Table 2A of Appendix A.

Methods

To address scarring in terms of wage penalties, a log-wage linear regression panel model is fitted. We apply a fixed-effects model, which eliminates biases that occur by the failure to include controls for unmeasured personal characteristics such as motivation to work or ability to keep a job. In fixed-effects models, comparisons within individuals are conducted by (1) averaging at least two wage observations and by (2) modeling their

deviations from this average. Since the unobserved heterogeneity in fixed-effects models is assumed to be time constant, any difference with its mean results in 0 and is dropped from the model. The model yields the following linear specification:

$$\ln w_{it} = \boldsymbol{\beta}'\mathbf{x}_{it} + \alpha_i + e_{it} \qquad (1)$$

Where $\ln(w_{it})$ is the natural logarithm of hourly wage at time t for individual i. $\mathbf{x}_{it}$ refers to a vector of observable variables on individual characteristics, $\boldsymbol{\beta}'$ refers to a transposed vector that accounts for coefficients associated with the observable characteristics. Finally, α_i refers to the time-invariant individual specific errors that capture the unobserved heterogeneity while the e_{it} is the equation error term. To test our hypotheses we start with a model that includes the separate indicators of unemployment, namely: recent unemployment occurrence, duration, and repetition. In this case, wage equation (1) is extended to the following specification:

$$\ln w_{it} = \boldsymbol{\beta}'\mathbf{x}_{it} + \boldsymbol{\gamma}'\mathbf{u}_{i,t-1} + \alpha_i + e_{it} \qquad (2)$$

Where $\boldsymbol{\beta}'$ includes a vector of the observable characteristics indicating workers' education, tenure, age, employed in the same occupation, marital status, home living children, sector, type of contract, weekly working hours, payment period and unemployment rate. The value of $\mathbf{u}_{i,t\text{-}1}$ refers to the vector of (lagged) unemployment dimensions whereas $\boldsymbol{\gamma}'$ refers to a vector that captures the coefficients associated with each separate dimension of unemployment. Next, interaction effects are added to the

model to examine the stigma hypothesis. The wage equation (2) therefore extends to the following specification:

$$\ln w_{it} = \boldsymbol{\beta}'\mathbf{x}_{it} + \boldsymbol{\gamma}'\mathbf{u}_{i,t-1} + \boldsymbol{\lambda}'(\mathbf{ux})_{i,t-1,t} + \alpha_i + e_{it} \qquad (3)$$

Where, $\mathbf{ux}_{i,t-1}$ refers to the vector of interactions between disadvantageous micro- and macro-level labor market conditions (i.e., old age, parenthood, ethnicity, tight labor markets during unemployment) and the unemployment index with $\boldsymbol{\lambda}'$ as the pertinent vector of coefficients. In addition, to test our expectation that men and women of different ages are affected differently by employers' hiring decisions we conducted stigma analyses separately among workers of young and old ages.

EMPIRICAL RESULTS

Testing the Human Capital Depreciation Hypothesis

It is important to recall that a central expectation of our first *human capital depreciation* hypothesis was that each specific indicator of unemployment would entail a negative effect on re-employment wages leading to wage inequalities between those with and without previous unemployment spells. The descriptive results in Figure 2 provide an initial clue concerning the unemployment scarring effects, showing that unemployed workers not only have lower wages compared to their continuously employed companions, but that these wage differentials grow larger over time.

FIGURE 2 ABOUT HERE

In Table 1 we present baseline results from fixed-effects models for men and women separately. These models do not control for any differences in human capital, demographic differences, or macro fluctuations, but provide information about the gross effects of unemployment indicators on the re-employment wages of men and women. Model 1 in Table 1 indicates that, for women, unemployment occurrence in the previous wave is key to scarring, inflicting an hourly wage penalty of 13.8 percent. In contrast, for men, all the three different dimensions of unemployment seem to affect their wages negatively. Different from women, the first spell of unemployment cuts the deepest scar in re-employment wages for men with 7.1 percent, followed by unemployment occurrence and increasing for each additional year in unemployment. So far, our results are in line with earlier results established in the UK (Arulampalam et al. 2000) and imply that once unemployed, workers will suffer wage penalties over longer periods.

TABLE 1

We next explore whether these results continue to persist once we control for human capital, demographic, in addition to job and macro variables. Results from four fixed-effect regression models that test for human capital depreciation effects are presented in Table 2. By including individual-level and business cycle differences, Models 1 and 2 test the human capital depreciation hypothesis followed by a third column which tests for gender differences. In Models 3 and 4, we include the unemployment index to measure the combined 'total' effect of unemployment on workers' re-employment wages. Also here the last column tests for gender differences within our estimates.

TABLE 2

With regard to the human capital depreciation hypothesis, we have argued that recent unemployment occurrence, duration, and repetition will have an added negative effect on post-unemployment wages due to the loss and/or depreciation of human capital which proves to be highest among women. Taking into account the listed background variables, results from Model 1 and 2 show more pronounced scarring effects (especially for women) as opposed in the findings in Table 1. Specifically, Models 1 and 2 in Table 2 indicate, that for women, a first unemployment spell inflicts an average wage scar of about 15.4 percent compared to women in continuous employment. In addition, women who experienced unemployment one wave earlier earn on average 13.7 percent lower hourly wages; a penalty that differs significantly between men and women. For women, we find no evidence that the wage gap grows over the spell of unemployment.

The growing wage penalties are present among men, however. Specifically, the wage penalty grows by 3.2 percent for every additional year in unemployment whilst a first unemployment spell causes hourly wages to decrease by 8 percent compared to those earned by men in continuous employment. These results imply that an initial incidence of unemployment not only gives rise to a wage penalty, but that this penalty grows over each additional year in unemployment. Interestingly, we find that both women and men who return into the same occupation earn respectively 3.6 and 3.3 percent higher wages compared to those who fail to do so. Furthermore, only for men, we find a wage penalty of 4 percentage points for each year lost in on-the-job training. Finally, we also find a motherhood wage penalty of 3.6 percent and a fatherhood wage *reward* of 1.6 percent.

These results are in line but much lower than the reported results of 20 percent by Misra et al. (2007) for the case of the Netherlands.

How large is unemployment scarring when we *combine* the different unemployment indicators? To answer this, we have added the standardized unemployment index in Model 3 and 4 in Table 2. The index gives us an opportunity to look at unemployment on a continuous scale where cases vary from workers with no unemployment scores to those with extensive scores. As the index has been rescaled into a 0..1 variable, the coefficients reflect effects between those in continuous employment and workers with the most recent, most often, as well as the longest unemployment spells. According to the estimates and as expected, the full cost of unemployment experiences is higher for women (30 percent) than for men (22.8 percent). This implies that as the combination of the unemployment dimensions (i.e., the unemployment index) increases by one unit, the log of net hourly wages decreases by an additional 30 percent for women and 23 percent for men. Translated into real net wages, a female worker with an average net hourly pay of 30 Dutch guilders[3] would suffer around 9 Guilders pay penalty per day (based on 8 working hours per day) or else 2,376 Guilders wage penalty per year on the basis of full-time work (22 days per month) compared to a male counterpart who suffers a pay penalty of 1,822 Guilders per year. Adding up the separate effects into the index indicate a much larger wage penalty than already reported in existing unemployment studies. The absence of gender difference in unemployment scarring, however, implies that unemployment scarring is distributed evenly among Dutch men and women.

Testing for Stigma Effects

Using explanations from the stigma model, we hypothesized that unemployment scarring should be more pronounced among men and especially higher among disadvantaged groups such as workers of older ages, non-natives, and working mothers. In addition, we also prove that unemployment scarring is higher in times of economic upturns. As mentioned earlier – after controlling for individual differences – interaction between unemployment and potential stigmatizing characteristics would indicate the existence of stigma effects, while an absence of such effects would favor the human capital depreciation hypothesis. To test the stigma hypotheses 2a-2d, we first run two separate models for women (Model 1) and men (Model 4) in Table 3 that include the various interaction terms and control for human capital and demographic differences.

Interestingly, results from Model 1 and Model 3 suggest that especially men who experience unemployment at older ages (45 and older) experience a substantial wage penalty of around 31 percent compared to younger male workers. For women, all the different interaction terms remain non-significant suggesting that unemployment wage penalties among women are not skewed along lines of parenthood, age, ethnicity, or labor market conditions.

A rival account of these findings is that stigma effects may exist among men and women but only across different age groups. Existing literature suggests that stigma effects may be more pronounced among older age groups (DiPrete 1981); effects that may fade away when looking over the entire age group. To test this possibility, we examined the data separately for different age groups by estimating models separately for young women (Model 2) and men (Model 5) and for older women (Model 3) and men

(Model 6). We classified those aged between 20-35 years as young workers, and those between 36-50 years as older workers.

Again, the results in Model 2 and 3 show that no significant interaction effects exist between the unemployment index and women's disadvantageous characteristics at different ages. For men, results from Model 5 and 6 show that employers' hiring decisions are highly dependent on their age, ethnicity, and economic conditions. In particular, results in Model 5 show that the wage penalty of young men who experience unemployment during economic downturns closes by 23 percent. This result coincides with our hypothesis 2d which expected lower wage penalties during economic downturns because firms attribute the job loss to firm closures and reorganizations rather than to a worker's own lack of motivation or performance. Interaction effects with other disadvantageous characteristics appear non-significant among this age group.

Remarkably, results in Model 6 show three contrasting results among older male workers. First, we find that the wage penalty of male workers between 35-50 years of age widens by almost 59 percent when unemployment is experienced during tight labor market conditions. An explanation for this is, that in times of high unemployment rates and stiff competition between job seekers, employers prefer younger workers because their skills may adapt better to the newly created occupations. As hypothesized in hypothesis 2a, employers are more likely to hire older workers in low-pay jobs that do not require long periods of retraining on-the-job, which corroborates with our extensive wage penalty.

Second and interestingly, our results demonstrate a weak but significant wage penalty for unemployed men who are non-native, suggesting that the wage gap between

native and non-native male workers between the ages of 35-50 widens by an average of 39 percent in their record of net hourly wages. This implies that being unemployed and non-native is an added complication, which reinforces any negative wage effect that relates to certain ethnical stereotypes prospective employers may induce.

Finally, although not statistically significant, unemployment experience among fathers with home-living children counteracts any previously existing wage rewards related to fatherhood. This contradicts our expectations that existing gender wage inequalities exacerbate during unemployment periods with the motherhood status but invalidate the existing view that this is due to stigmatization for women, at least for the Dutch case.

CONCLUSIONS AND DISCUSSION

Unemployment literature has continuously demonstrated significant wage penalties exist between groups of previously unemployed workers and those with no such gaps. Wage differences would reflect loss of worker's human capital and employer's prejudgment regarding worker's past spells of unemployment. However, little is known when unemployment scarring arises due to stigma or to human capital depreciation? More importantly, does the scarring differentiate between men and women of different age groups? The resurgence of research on unemployment has focused primarily on the direct associations of different dimensions of unemployment (i.e., recent occurrence, repetition, and duration of unemployment) on workers' post-unemployment wages. Attention on the single dimensions of unemployment has meant that the combined and

thus total effect of unemployment on workers' post-unemployment wages has been overlooked in existing literature.

This study presents an alternative approach. It examines unemployment scarring among men and women of different ages and under different circumstances. The guiding assumption is that if stigma drives unemployment scarring, then scarring effects should exacerbate in specific (tight) labor market situations and among specific (disadvantaged) groups (e.g., age, parenthood and/or ethnicity groups). By contrast, little or no contextual variation would indicate that human capital depreciation effects dominate. Using longitudinal data from the Dutch Labor Supply Panel (OSA) spanning over the period 1980-2000 we constructed an unemployment index, which combined the different unemployment dimensions into a single measure.

Our findings offer meaningful theoretical contributions to the literature on unemployment scarring. First, our research suggests that unemployment effects are additive, such that the effect of single unemployment dimensions adds up to a much larger total scarring effect than already indicated in the literature. Specifically, the highest negative wage effects were found among women, although we did not find significant gender effects to exist. In the spirit of classic human capital and signaling theories, we combined workers unemployment experiences (through the unemployment index) with workers additional disadvantageous traits to test whether scarring effects arise due to human capital depreciation effects or stigma effects. We find that scarring effects exacerbate with ethnicity and in particular during economic downturn, but only among male workers of 35 to 50 years of age.

Second, our results provide an explanation for the reversal of why unemployment scars, by showing that – for women – unemployment scarring arises mainly due to human capital depreciation, while for men, they are due to stigma effects. More importantly, we find that discriminatory practices in hiring are more likely to occur during economic downturns among older male workers because of stiff competition between job seekers and because employers may refuse to retrain older workers in uncertain economic times to manage their costs. This finding advances existing literature (Blanchard and Diamond 1994; Omori 1997), which assumed that unemployment should be less scarring by showing that this is conditional upon gender and age. Our study also reveals a possible racial disadvantage in post-unemployment wages, which widens with more extensive unemployment spells.

Finally, our study demonstrates gender differences exist in parenthood status such that mothers are penalized in their hourly wages while fathers are rewarded for being a parent. However, we find (weak) evidence that parenthood combined with unemployment may be particularly harmful among fathers with home-living children and not among mothers as we expected initially. Although this result was almost significant, it deserves a deeper understanding of the conditions under which unemployment in combination with parenthood becomes scarring.

What can we learn from the findings of this particular study? First and foremost, we have shown that it is fruitful to study the effects of different unemployment dimensions simultaneously. The different dimensions of unemployment are measured in different units of analyses and differ considerably between workers. This study shows that creating an unemployment index is a useful tool to measure the 'full' effects of

unemployment, and in doing so, calls into question the reported magnitude of unemployment scarring which might have been underestimated in existing literature.

Second, our results suggest that loss of on-the-job training and occupation specific knowledge exacerbate wage penalties, especially among men. The results imply that mismatching between the former and current occupations may be a crucial, yet overlooked area in existing scarring research. Similar to the recent approach by Moore (2010), additional research is needed that reveals wage differences resulting from mismatching and differences in workers search behavior.

Third, in this study we assumed that wage disadvantage related to ethnicity, which was revealed among male workers between 35-50 years, was the product of stigma. However, lack of social networks and less effective search strategies may be an alternative explanation for this wage gap that should be investigated with more rigor in future research.

Fourth, while our results suggest that unemployment scarring arises through human capital depreciation for women, it should be emphasized that for specific groups of women – such as those who have received a lower level of education or who are in lower wage quintiles – stigma effects may play a role as well. More research is needed to explore these differences and understand when human capital depreciation effects dominate the stigma effects and for which groups. Finally, in the present study we have used wage penalties to draw conclusions about stigma effects. More research is needed on the firm recruitment behavior to understand why stigma effects exist.

These findings also provide directions for future policies. First, results of this study show that the best way to prevent unemployment scarring is to avoid falling into

unemployment to begin with. In addition, our results in favor of stigma effects during economic downturns ask for more attention from governments to design policies that protect workers from becoming unemployed (i.e., wage subsidies) during economic crises. Such measures would not only stimulate employers to hire sooner those once unemployed, but would also raise worker's self-esteem and confidence and make them more ready to accept a job.

This study has shown that breaking the chain of employment has far-reaching and long-term negative consequences for workers' re-employment wages that in turn may affect the lives of their families as well. The latter needs to be investigated in more detail, perhaps in future research.

Women also form a group that deserves more attention in the labor market. Their vulnerable position in the labor market and the higher wage penalties during their work career call for gender specific policies that offer institutional support like in the form of subsidies for childcare. This would not only support a broader labor market attachment of women, but also assure equal rewards for women in continuous employment and those who once experienced unemployment.

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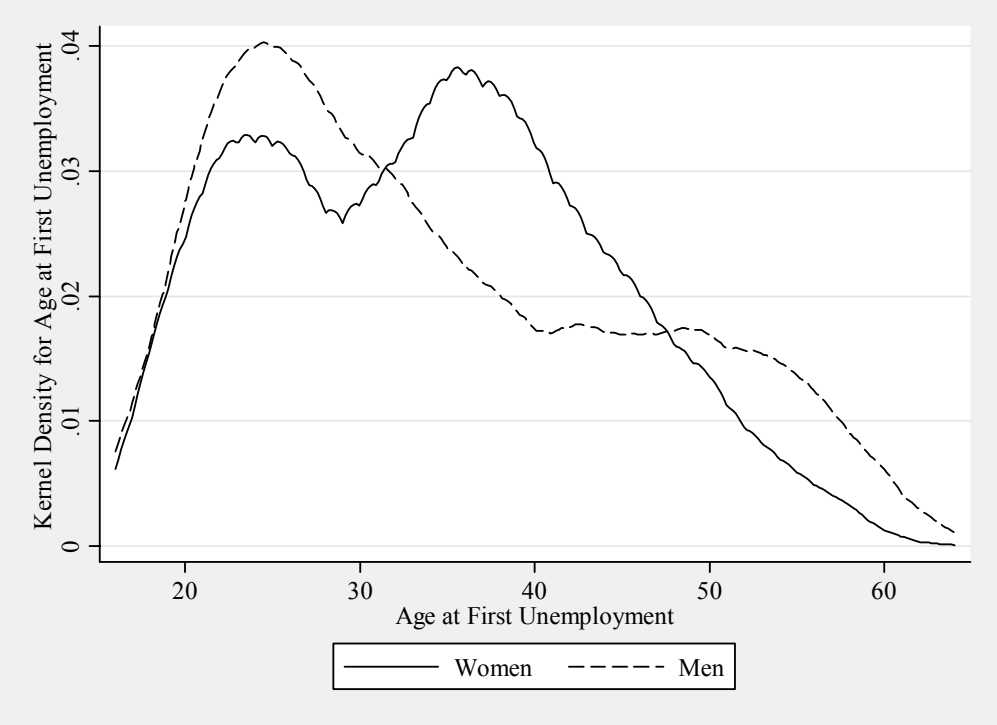
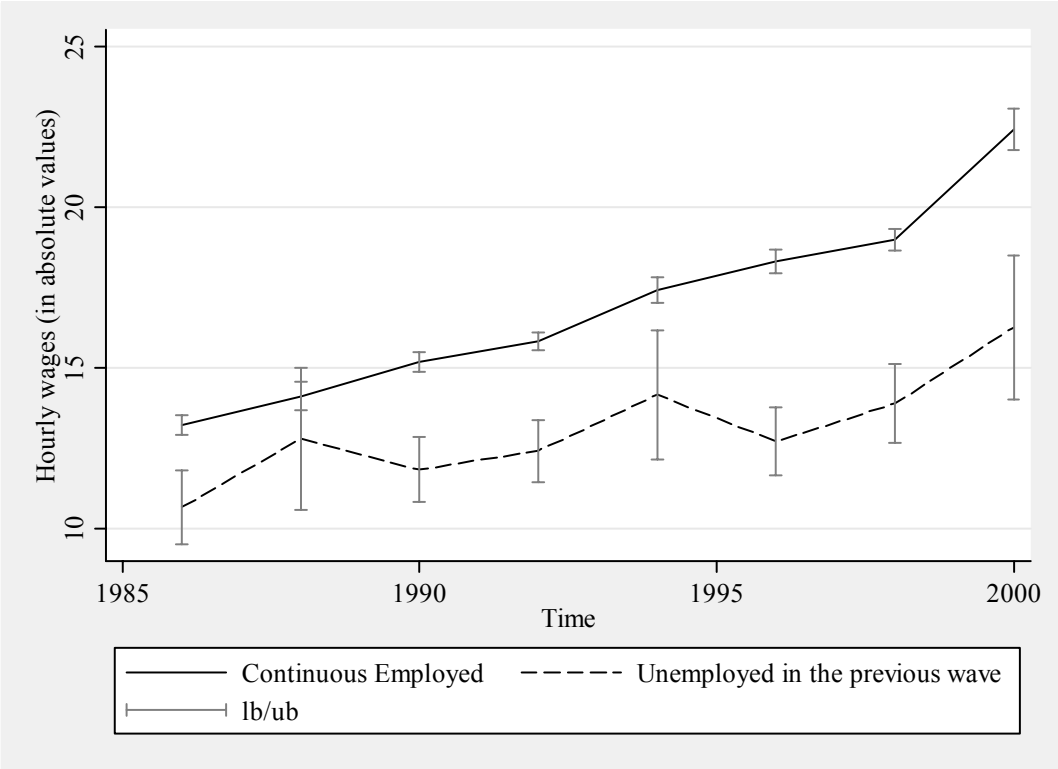
FIGURE 1
The Distribution of the Age at First Unemployment, by Gender, 1980-2000



SOURCE: Data are from the OSA Supply Panels, 1985-2000, Netherlands.

FIGURE 2
Wage Distribution of those in Continuous Employment vs. those Unemployed One Period Earlier



SOURCE: Data are from the OSA Supply Panels, 1985-2000, Netherlands.

TABLE 1
Baseline Fixed-Effect Estimates for the Effect of Unemployment on Subsequent Log of Hourly Wages, by Gender, The Netherlands 1980-2000

	Female	Male
	(1)	(2)
Unemployment occurrence (T-1)	-0.138***	-0.047*
	(3.65)	(1.88)
Unemployment duration, years (T-1)	0.003	-0.029**
	(0.26)	(2.48)
First unemployment (T-1)	-0.061	-0.071**
	(1.15)	(2.46)
Unemployment repetition (T-1)	0.004	0.006
	(0.15)	(0.45)
Constant	2.321***	2.488***
	(213.02)	(664.11)
Observations	3,937	7,192
Number of Respondents	1,888	2,982
R-squared	0.007	0.004

SOURCE: - Authors' calculations, using data from the OSA Supply Panels, 1985-2000.
NOTE: The dependent variable is the *log of hourly wages*; - Absolute value of t statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1% .

TABLE 2
Unstandardized Coefficients for the Effect of Unemployment on Subsequent Log of Hourly Wages, from Fixed- Effects Models by Gender, The Netherlands 1980-2000

	Separate Human Capital Effects			*Combined Human Capital Effects*		
	Female	*Male*	Δ	*Female*	*Male*	Δ
	(1)	(2)		(3)	(4)	
Unemployment indicators						
Unemployment occurrence (T-1)	-0.137***	-0.002	**	-	-	
	(3.05)	(0.06)				
Unemployment duration, years (T-1)	-0.014	-0.032***		-	-	
	(1.16)	(2.89)				
First unemployment (T-1)	-0.154***	-0.093***		-	-	
	(2.67)	(3.52)				
Unemployment repetition (T-1)	-0.001	-0.022		-	-	
	(0.02)	(1.60)				
(Standardized) Unemployment index	-	-		-0.306***	-0.228***	
				(3.74)	(3.96)	
Human Capital Measures						
Education level	-0.006	-0.013		-0.007	-0.012	
	(0.25)	(1.21)		(0.29)	(1.19)	
Tenure (years)	-0.003	-0.004**		-0.001	-0.005**	
	(0.53)	(2.09)		(0.12)	(2.32)	
Same occupation	0.036**	0.033**		0.039**	0.026**	
	(1.97)	(2.55)		(2.14)	(2.05)	
Age (years)	0.007	0.025***		0.008	0.023***	
	(0.56)	(4.51)		(0.58)	(4.21)	
Age squared	-0.000	-0.000***		-0.000	-0.000***	

	(0.25)	(4.22)		(0.23)	(4.00)	
Demographic, job –and macro variables						
Married	-0.064*	-0.035*		-0.065*	-0.035*	
	(1.67)	(1.70)		(1.71)	(1.68)	
Home living children	-0.036***	0.016***	***	-0.036***	0.017***	***
	(2.97)	(3.43)		(3.03)	(3.79)	
Ethnicity (1= non-Dutch)	-0.016	-0.005		-0.020	-0.007	
	(0.31)	(0.16)		(0.37)	(0.23)	
Working hours	-0.014***	-0.020***	***	-0.014***	-0.020***	***
	(13.13)	(20.18)		(13.04)	(20.26)	
Payment period	0.003***	0.000	**	0.003***	0.000	**
	(2.70)	(0.66)		(2.76)	(0.58)	
Sector (= public)	0.006	0.003		0.006	0.003	
	(0.35)	(0.30)		(0.33)	(0.25)	
Type of contract (= permanent)	0.032	0.010		0.033	0.011	
	(1.30)	(0.78)		(1.35)	(0.86)	
Unemployment rate	0.001	-0.006**		0.002	-0.006***	
	(0.31)	(2.55)		(0.43)	(2.60)	
Constant	2.507***	2.810***		2.546***	2.861***	
	(8.35)	(22.74)		(8.55)	(23.45)	
Observations	3,004	5,679		3,004	5,679	
Number of Respondents	1,584	2,479		1,584	2,479	
R-squared	0.138	0.160		0.134	0.156	

SOURCE: - Author's calculations, using data from the OSA Supply Panels, 1985-2000.
NOTE: The dependent variable is the *log of hourly wages*; - Absolute value of t statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

TABLE 3

Unstandardized Coefficients for the Stigma Effect of Unemployment on Subsequent Log of Hourly Wages, from Fixed- Effects Models by Gender and Age, The Netherlands 1980-2000

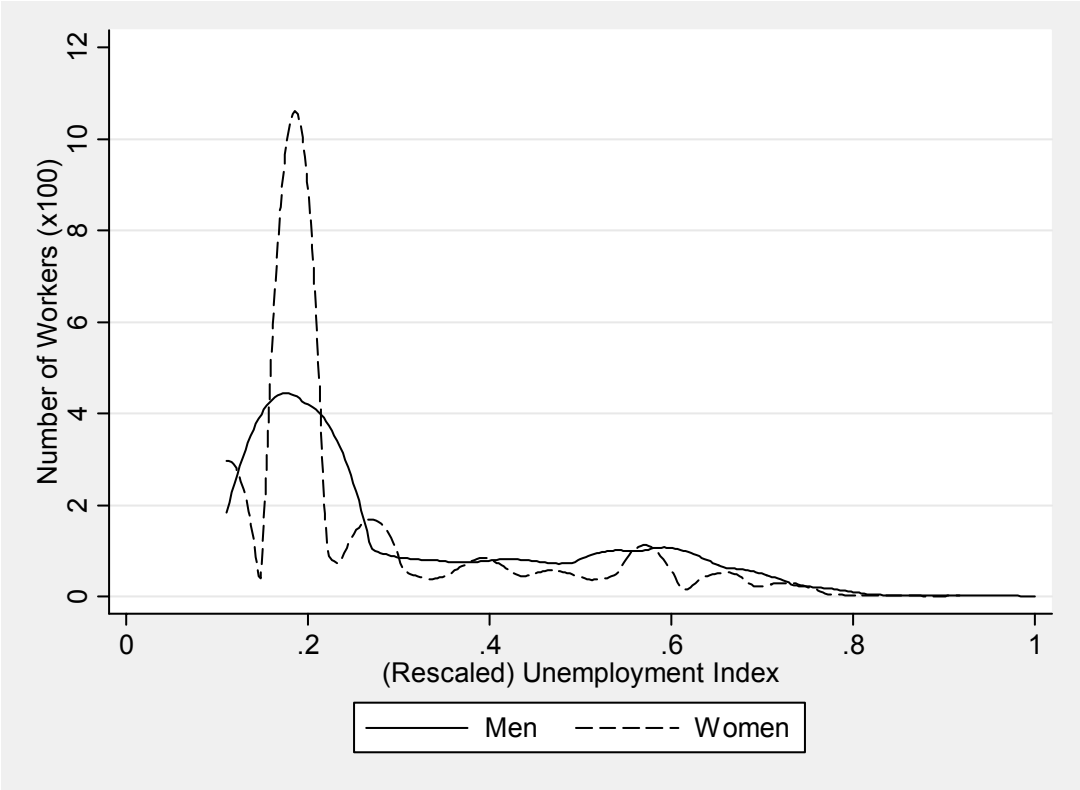
	Stigma Effects			*Stigma Effects*		
	Female			*Male*		
	ALL	20-35 yrs	36-50 yrs	ALL	20-35 yrs	36-50 yrs
	(1)	(2)	(3)	(4)	(5)	(6)
Unemployment index	-0.055	-0.025	-0.008	-0.004	-0.075**	0.128***
	(1.43)	(0.48)	(0.13)	(0.15)	(2.03)	(3.18)
High unemployment at year of unemployment	-0.269	-0.109	-1.040	-0.161	-0.480***	0.512*
	(1.37)	(0.49)	(0.75)	(1.42)	(3.85)	(1.72)
Unemployed ≥ 45 years *(ref: otherwise)*	0.007	-	-	0.003	-	-
	(0.10)			(0.07)		
Non-Dutch (*ref: Dutch*)	0.008	0.006	0.080	0.011	0.024	0.038
	(0.17)	(0.08)	(1.06)	(0.35)	(0.48)	(0.95)
Home-living children (*ref: no children)*	-0.010	0.023	0.008	0.012	0.056*	0.035
	(0.19)	(0.47)	(0.07)	(0.47)	(1.77)	(0.86)
Not home-living (*ref: no children)*	0.069	0.056	0.100	-0.029	-0.000	0.042
	(1.30)	(1.10)	(0.85)	(1.06)	(0.01)	(0.98)
Interaction Effects						
High unemployment × unemployment index	0.196	0.048	-0.136	-0.116	0.233*	-0.588***
	(1.32)	(0.22)	(0.53)	(1.11)	(1.72)	(3.58)
Unemployed ≥ 45 years × unemployment index	-0.509	-	-	-0.309**	-	-
	(1.52)			(1.97)		
Non-Dutch × unemployment index	0.122	0.088	-0.860	-0.131	-0.221	-0.395*
	(0.36)	(0.31)	(0.82)	(0.78)	(0.86)	(1.65)
Unemployment index × home-living children	-0.190	-0.295	0.729	0.019	0.102	-0.430
	(1.01)	(1.38)	(0.53)	(0.18)	(0.75)	(1.61)

Unemployment index × not home living children	-0.168	-0.136	0.261	-0.136	-0.098	-0.223
	(0.77)	(0.66)	(0.19)	(1.04)	(0.60)	(0.75)
Human Capital measures						
Education level	0.021	0.060**	0.007	-0.006	-0.020	-0.005
	(1.05)	(2.15)	(0.22)	(0.60)	(1.20)	(0.45)
Tenure (years)	-0.004	-0.007	-0.001	-0.009***	-0.005	-0.005**
	(0.89)	(1.10)	(0.13)	(4.66)	(1.46)	(2.02)
Same occupation	0.027	0.011	0.044*	0.013	-0.005	0.028
	(1.62)	(0.54)	(1.68)	(1.18)	(0.35)	(1.58)
Demographic, job, and macro variables						
Married	-0.042	-0.002	-0.058	-0.027	-0.060***	0.006
	(1.41)	(0.05)	(1.10)	(1.62)	(2.82)	(0.22)
Working hours	-0.013***	-0.007***	-0.023***	-0.022***	-0.029***	-0.018***
	(14.36)	(6.76)	(13.72)	(24.14)	(17.50)	(16.85)
Payment period	0.002*	0.002*	0.002	0.000	0.001*	0.001
	(1.87)	(1.79)	(1.50)	(0.97)	(1.80)	(1.50)
Sector (= public)	0.000	0.016	0.003	-0.009	-0.015	0.013
	(0.00)	(0.80)	(0.12)	(0.88)	(0.83)	(1.04)
Type of contract (= permanent)	0.042**	0.023	0.023	0.022*	0.018	0.012
	(2.00)	(0.88)	(0.65)	(1.95)	(1.16)	(0.71)
Constant	2.612***	2.223***	2.868***	3.350***	3.640***	3.081***
	(22.96)	(16.29)	(16.28)	(48.93)	(35.52)	(34.80)
Observations	3,402	1,594	1,718	6,011	2,440	4,315
Number of Respondents	1,685	897	899	2,566	1,266	1,920
R-squared	0.131	0.101	0.220	0.167	0.254	0.116

SOURCE: - Authors' calculations, using data from the OSA Supply Panels, 1985-2000.
NOTE: The dependent variable is the *log of hourly wages*. - Absolute value of t statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

APPENDIX A

Figure 1A: The Kernel Distribution of the Rescaled (0/1) Unemployment Scale



SOURCE: Data are from the OSA Supply Panels, 1985-2000, Netherlands.

TABLE 1A:
Workers' Wage Observations across the Nine Waves

Wage Observations	Waves								
	1986	*1988*	*1990*	*1992*	*1994*	*1996*	*1998*	*2000*	*Total*
2	4,376	301	214	98	64	42	26	7	5,128
3	0	2,351	159	126	55	32	18	10	2,751
4	0	0	1,398	95	81	32	16	4	1,626
5	0	0	0	878	52	45	16	4	995
6	0	0	0	0	511	22	20	8	561
7	0	0	0	0	0	303	7	4	314
8	0	0	0	0	0	0	132	1	133
9	0	0	0	0	0	0	0	61	61
N	*4,376*	*2,652*	*1,771*	*1,197*	*763*	*476*	*235*	*99*	*11,569*

SOURCE: Data are from the OSA Supply Panels, 1985-2000, Netherlands.

TABLE 2A
Means, standard deviations (SD) and sample size (N) of Previously Unemployed, by Gender

	Male Workers			*Female Workers*		
	Mean	*SD*	*N*	*Mean*	*SD*	*N*
Dependent measure						
Hourly wages (in Dutch guilders, absolute value)	11.86	5.83	1,762	10.27	6.92	1,837
Log of hourly wages (deflated)	2.39	0.37	1,762	2.24	0.35	1,837
Unemployment dimensions						
Unemployment occurrence (T-1)	0.11	0.32	1,434	0.14	0.35	1,378
Unemployment duration, years (T-1)	1.73	1.08	1,434	1.91	1.12	1,378
First unemployment (T-1)	0.04	0.22	1,762	0.02	0.18	1,837
Unemployment repetition (T-1)	1.66	0.95	1,762	1.46	0.80	1,837
Human Capital Measures						
Elementary education	0.00	0.00	1,762	0.00	0.02	1,837
Lower intermediate education	0.36	0.48	1,762	0.34	0.47	1,837
Higher intermediate secondary education	0.32	0.46	1,762	0.39	0.48	1,837
Vocational college	0.17	0.38	1,762	0.18	0.38	1,837
University degree	0.06	0.24	1,762	0.02	0.15	1,837
Tenure (years)	2.36	1.27	1,762	2.28	1.14	1,837
Same occupation	0.62	0.48	1,762	0.59	0.49	1,837
Age (years)	38.1	12.4	1,762	36.7	10.59	1,837
Demographic, job, and macro variables						
Married	0.74	0.44	1,762	0.77	0.42	1,837
Non-Dutch	0.03	0.17	1,762	0.03	0.17	1,837
Working hours	37.0	5.30	1,706	24.6	11.4	1,827
Sector (= public)	0.26	0.44	1,725	0.28	0.45	1,778
Type of contract (1= permanent)	0.88	0.32	1,762	0.84	0.36	1,837
Macro variables						
Unemployment rate	5.38	1.16	1,762	10.03	1.99	1,837

[1] The four indicator variables are highly interrelated. Constructing an index allows us to avoid multi-collinearity problems in interaction models. However, the four indicators all tap independently collected information, and averaging them also redresses random measurement error.
[2] http://statline.cbs.nl/StatWeb/selection/default.aspx?DM=SLNL&PA=80718NED&VW=T
[3] 1 Dutch Guilder = 0.6176USD; rates updated by November 2011 (http://www.exchangerateusd.com/NLG)