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Labour force dynamics and the obesity gap in female unemployment in Finland

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In this paper we analyse the obesity gap in female unemployment in Finland. A growing body of research has documented that women suffer from obesity penalties in the labour market, whereas men do not. In this paper, we focus on the link between obesity and female unemployment. Since the obesity gap in unemployment may be due to both worker and employer behaviour, our approach provides an interesting test case for analysing various hypotheses put forward to explain the obesity gap in labour market rewards. With data from the Finnish component of the European Community Household Panel, we start by decomposing the obesity gap in unemployment rates to transitions between labour market statuses. The results show that the difference in transitions from unemployment to employment is the most important component of the difference in unemployment rates. We further analyse this transition by performing event-history analyses of the transitions from unemployment to employment and by looking into the job search behaviour of obese versus non-obese women. The obesity gap in transitions from unemployment to employment remains after controlling for human capital and demographic features. Neither do obese women differ from their non-obese peers in job search behaviour. We conclude that employer discrimination is an important explanation of the obesity gap in female unemployment.

Keywords: Obesity, unemployment, discrimination, longitudinal data, dynamic analysis, Finland

Introduction

Increasing prevalence of obesity in the developed countries has been well documented (e.g. OECD 2006). Finland is no exception. According to data published by the OECD (2006), Finnish obesity rates increased from 7.4 percent in 1980 to 8.4 in 1990, and to 14.0 percent in 2004 (see also Lahti-Koski 2001). Acknowledgement of it adverse health outcomes has made obesity a public health concern.

Social scientists and epidemiologists have long recognized the socio-economic correlates of obesity. According to a recent review of the research (McLaren, 2007), the current consensus is that in economically developed countries, obesity is negatively associated with such measures of socio-economic status as educational attainment, incomes, and employment. While the causality is commonly seen as flowing from socio-economic status to obesity, a growing body of research has considered the possibility that obesity may cause socio-economic disadvantage.

Several studies have found that obese women suffer from labour market disadvantage in terms of higher unemployment and lower wages, whereas obese men do not experience such penalties (eg., Pagán & Dávila 1997; Cawley 2004; Garcia & Quintana-Domeque 2007; Conley & Glauber 2007;

I wish to thank the Editors and two anonymous referees for insightful comments that helped in improving a previous version of the paper. All remaining errors are mine. Address: Juho Härkönen, Department of Sociology, Yale University, P.O. Box 208265, New Haven, CT 06511 USA. Email: Juho.Harkonen@yale.edu

for Finland, Sarlio-Lähteenkorva & Lahelma 1999; Sarlio-Lähteenkorva et al. 2004; Härkönen & Räsänen 2008). For example, a recent study found that obese women in Finland are approximately twice as likely to be unemployed than non-obese women and they face a 5 percent wage penalty, after controlling for background factors (Härkönen & Räsänen 2008). For men, no differences according to obesity status were found.

The literature features a number of explanations of the association between female obesity and labour market disadvantage. These explanations—which will be discussed in more detail in the next section—have either stressed common factors that predict both obesity and labour market outcomes (heterogeneity), poor labour market success as a predictor of obesity (endogeneity), or factors that cause obese women to succeed poorly in the labour market (causality). Despite an increasingly accepted view that both selection and causal processes contribute to the explanation and that employer behaviour plays a role, several questions remain unanswered.

A clear gap in the literature is the lack of analyses on the relationship between obesity and labour market dynamics. Dynamic analysis of employment and unemployment is standard procedure in labour market research, yet we are not aware of any studies on the dynamic associations between obesity and labour market outcomes.

The objective of this paper is to contribute to the understanding of the obesity gap in female unemployment by analysing the dynamic roots of this gap in Finland. We concentrate on women due to the well-established result that obese men do not experience labour market penalties. Furthermore, we focus on unemployment as an indicator of problems in finding work. Unemployment can cause major economic and psychological distress and is a central social indicator. Since unemployed workers are by definition expected to search for and be available for work, this design also enables better tests of hypotheses that emphasise employer versus worker behaviour than one, which examines employment rates overall. Dynamic analysis yields similar advantages, as it enables one to move from analysing unemployment as a status to analysing unemployment as a process (Blossfeld & Rohwer 2002).

The structure of the paper is the following. In the next section, we discuss the relevant explanations of the obesity gap in female labour market outcomes. We then introduce the data, the European Community Household Panel, and the analytical strategy. After that we proceed to the analyses, where we first break down the difference in unemployment rates into differences in labour market flows. This decomposition points to a gap in flows from unemployment to employment as the single most important component. We then analyse this transition in more detail with event history models, seek for obesity status differences in job search behaviour and perform indirect analyses of employer discrimination.

Theoretical background and hypotheses

The sociology and economics of health and social epidemiology have long-standing interests in the socioeconomic correlates of health (e.g., Smith 1999; Adler & Osgrove 1999). The main group of studies on the positive association between socioeconomic status and health takes as a starting point the assumption that low socioeconomic status produces poor health, and has sought for mechanisms that could account for this causal relationship. An alternative approach turns the causality upside down by arguing that socioeconomic status is influenced by health factors that possibly date back to childhood and adolescence, or that health and socioeconomic status are affected by common background factors such as personality traits (Blossfeld & Rohwer 2002; Adler & Osgrove 1999; Smith 1999; Koivusilta et al. 2003; Palloni 2006).

Similar explanations have been given to the negative socioeconomic gradient of obesity in general, and can be used to approach the positive association between obesity and unemployment in particular. Unemployment, especially when it is long-term or repeated, has been claimed to increase obesity risk through lower resources for a healthy diet, stress, or other factors (e.g., Morland et al. 2002; Lahti-Koski 2001). On the other hand, the general finding that obesity levels are higher among less educated people leads one to expect that the relationship between obesity and unemployment stems from an effect of education (and other human capital factors) on both obesity and unemployment; in other words, that the effect of obesity on unemployment is spurious. Some researchers have further speculated on the possibility that obesity is an outcome of limited self-control and myopic be-

haviour (Cutler et al. 2003), traits, which can also lower productivity and labour market success.

Obesity can have a causal effect on unemployment and other labour market outcomes. The negative health implications of obesity may mean more absenteeism and thus lower productivity, which may translate to a higher risk of being fired or lower chances of being hired. Some jobs may also have requirements for physical appearance, to which obesity does not fit (cf. Harper 2000). However, discrimination by body weight is the most common explanation given to the obesity gap in unemployment and other labour market outcomes (e.g., Pagán & Dávila 1997; Cawley 2004; Carr & Friedman 2005; Conley & Glauber 2007). Employer discrimination against obese workers may operate through plain distaste. Obesity can also act as a signal of low self-control and other unwanted traits, which were discussed above. Empirical support for the discrimination hypothesis is usually indirect so that what is not explained through standard variables is interpreted as discrimination. However, obese workers also experience higher levels of subjective discrimination (Carr & Friedman 2005).

Perhaps the most compelling case supporting the discrimination hypothesis is the finding that obese women experience labour market penalties whereas obese men do not. Given the standard gendered assessments of body weight in Western societies, obese women can be judged with tougher criteria than obese men (although Carr and Friedman (2005) did not find gender differences in experienced discrimination). This can be seen as an example of a more general dual standard, in which men and women are assessed differently. Other examples of assessments by body features are findings suggesting that tall men experience labour market premiums whereas tall women do not (e.g., Harper 2000; Palloni 2006, 600).[1]

These gender differences may, of course, also result from other factors. Given that women generally face more pressure concerning body weight than men, nonconformity with these expectations may reflect lower self-control or weaker concerns of meeting normative expectations relative to men.[2] The obesity gap in female labour supply (measured as labour force participation) may be seen as providing support for such hypotheses that assume gender differences in personal features by obesity status (e.g., Garcia & Quintana-Domeque 2007). However, even if female obesity is not associated with lower self-control or nonconformity to (cultural) expectations than male obesity, female obesity can nevertheless act as a signal of such traits in the popular imagination, which may in itself penalise obese women. Pagán and Dávila (1997) have also argued that obese men are more capable of sorting into jobs with lower requirements for appearance, which may explain a part of the gender differences in the obesity gap. However, also they concluded that discrimination is the likely explanation for the labour market penalties experienced by obese women.

Data on labour market dynamics can contribute to understanding the mechanisms behind the obesity gap in female unemployment and in labour market outcomes more generally. For example, if obese women have less self-control and other non-preferred (often unobservable) traits, we would expect that obese women not only have lower chances of getting a job, but that they also have a higher risk of losing a job, after controlling for human capital, demographic features, and job characteristics. We would also expect to find differences in job search behaviour between obese and non-obese women. On the other hand, if obese women face discrimination, we would expect to find an obesity gap in flows to employment but not in flows out of employment and no difference in job search behaviour, after controlling for the above variables. If, on the other hand, the link between obesity and labour market flows is spurious and caused by heterogeneity in (observed) background factors, we would expect the initial differences to disappear after controlling for these variables.

Data, variables, and methods

Data We use data from the four last waves (waves 4 to 8, years 1998 to 2001) of the Finnish European Community Household Panel (ECHP) data. The European Community Household Panel includes data from the fifteen member states of the European Union prior to the 2004 enlargement. The data include up to eight annual waves of follow-up infor-

[1] Sure enough, not all returns to psychical traits are gender specific: for example, Hamermesh and Biddle (1994) found that both men and women gain returns for attractiveness and Harper (2000) reported that unattractive workers and short workers experience significant pay penalties, irrespective of gender.

[2] I thank an anonymous referee for this insight.

mation on individuals and their households. The individual files include information on all household members aged 16 or above. The first wave was collected in 1994. The first wave of the Finnish subsample was collected in 1996 and the total Finnish subsample includes six waves. Information on height and weight was collected only in the last four waves of the panel; hence the decision to restrict the analysis to these waves. Although the last four waves are used, the analyses refer to three years (1998 to 2000) only. The reason for this is that monthly unemployment status, which is used in the dynamic analyses, is collected retrospectively, and refers to the status at each month of the previous year to the interview.

We restrict the analysis to women of working age (25-54 years). This excludes young women, who are more likely to be in education, and older women, many of whom start retiring. In these ages men and women are expected to participate in the labour market. In the descriptive analyses, we use the cross-sectional and longitudinal weights calculated by Eurostat to correct for sampling bias. Since the weights were constructed using a set of variables that commonly appear in the right-hand side of multivariate regression models, the weights may not help in correcting sampling bias but lead to a loss in efficiency (Winship & Radbill 1994). We also ran the analyses with weighted data, and we comment on the relevant differences in the text.

As all panel data, the ECHP suffer from attrition. We can see from Table 1 below that the biggest fall appears between the years 1998 and 2000. Attrition seems faster among non-obese than obese women. However, the annual obesity rates calculated from the data for age groups 17 to 64 years tracks the overall trend in obesity in Finland, when compared to OECD (2006) data (figures from the ECHP: 11.3 % (1998), 11.9 % (1999), and 12.6 % (2000)).

Variables The dependent variable of interest is the unemployment status of the respondent. According to the International Labour Organization, a person is unemployed if (s)he is not employed, is available for work, and is actively seeking employment. The ECHP reports the labour market status of the respondent according to the ILO definition and self-reported main activity status at time of interview, and retrospectively for each month of the previous year. We use the ILO definition for unemployment in the static analysis. In the dynamic analyses, we use the self-reported monthly main activity status variable.[3]

Table 1
Descriptive data on the variables used in the event-history analyses, all and by obesity status.

	All	By obesity status	
		Obese	*Not obese*
Unemployed, %	7.5	12.8	6.8
Obese, %	11.6	100	0
25-34 years, %	27.7	16.6	29.2
35-44 years, %	34.5	29.2	35.3
45-54 years, %	37.8	54.2	35.6
High education (ISCED 5-7)	43.6	26.9	46.0
Middle education (ISCED 3)	38.5	41.9	37.9
Low education (ISCED 0-2)	17.9	31.2	16.0
Married, %	68.6	68.8	68.6
Cohabiting, %	14.2	14.0	14.2
Single, %	17.2	17.3	17.2
Nbr. of children, mean	1.1	1.0	1.1
Child < 3 years, %	13.5	9.6	14.2
Bad or very bad health, %	3.2	8.9	2.4
Uusimaa, %	26.7	18.4	27.9
Southern Finland, %	35.9	43.4	35.0
Eastern Finland, %	14.8	15.4	14.8
Mid-Finland, %	14.4	15.1	14.2
Northern Finland, %	8.2	7.7	8.2
1998, %	39.1	37.4	40.1
1999, %	31.4	31.7	31.6
2000, %	29.5	31.0	28.3
Regional unempl. rate, mean	9.7	10.1	9.6
Regional obesity rate, mean	11.8	12.4	11.7
N (person months)	56,958	6,609	50,349
N (women)	2373		

Source: Eurostat (2003) European Community Household Panel, waves 6-8. Women aged 25-54 years, monthly data.

Our main independent variable is obesity, which is measured as a binary variable in which women with a body mass index (kg / m^2) of 30 or above are considered obese. Dummy coding of obesity is commonly used in the literature, since a body mass index of 30 or above not only is a clear health risk factor but is also a signal of higher-than-normal body weight.

[3] The unemployment rates (percentage of unemployed of the labour force) estimated using the monthly variable are higher than the ones estimated using the ILO definition. Additionally, the obesity gap in employment is bigger when the self-reported statuses are used.

Our results remained qualitatively equal when a continuous version of BMI was used.

In the multivariate analyses, we control for spurious effects of obesity on labour market dynamics with a standard set of demographic and human capital variables. Age is measured through three categories (25-34, 35-44, and 45-54 years) and controls for the finding that both female obesity and labour market dynamics vary across the life course (and across cohorts). Education (high (ISCED 5-7, tertiary education), middle (ISCED 3, second stage of secondary education), and low (ISCED 0-2, less than second stage of secondary education)) is used to control for possible spuriousness arising from the well-known effects of education on labour market outcomes and the negative correlation between education and obesity (McLaren 2007). Obesity levels can also vary by marital status (single, married, or cohabiting), which affects female labour market outcomes. Female labour market outcomes are furthermore affected by children (which we measure by the number of children and presence of a child who is less than three years old); due to post-delivery weight gain, these variables are also a potential source of spuriousness. We also control for subjective health status (dummy; unity if bad or very bad health), which can be affected by obesity, but also influence body weight. Finally, we control for regional (according to the EU NUTS2 classification [4] and annual variance (year dummies) in obesity and unemployment.

The means of these and other variables used in the analyses are shown in Table 1.

Methods Our analytical strategy consists of two steps. We first decompose the obesity gap in unemployment rates to obesity gaps in labour market dynamics. In the second step, we focus on the dynamics that are most relevant for explaining the obesity gap in unemployment rates.

In the first step, the dynamic decomposition of rates into flows, we start off with the following formula (cf. Azmat et al. 2006):

$$r = \frac{h_{eu}}{h_{ue} + h_{eu}} \tag{1}$$

where r is the steady-state rate of unemployment, h_{eu} is the transition rate from employment to unemployment, and h_{ue} is the transition rate from unemployment to employment. An increase in flows from employment to unemployment increases the unemployment rate, while an increase in transitions in the other direction (decreasing unemployment duration) decreases the unemployment rate.

A problem with this decomposition is that it assumes only two labour market statuses, unemployment and employment. However, obese women have higher rates of inactivity than non-obese women and the obesity gap in unemployment may also be linked with, for instance, obese women experiencing spells of unemployment upon re-entry into the labour force. Azmat et al. (2006, 11) presented the following formula to introduce inactivity as an extra status:

$$u = (1 - \alpha)\frac{h_{eu}}{h_{eu} + h_{ue}} + \alpha\frac{(h_{ei}/h_{ui}}{(h_{ei}/h_{ui}) + (h_{ie}/h_{iu})} \tag{2}$$

According to (2), an unemployment rate is the weighted average of two component unemployment rates: an unemployment rate in which there are no flows to and from inactivity, and one in which all flows between unemployment and employment go through a period of inactivity. The former is a weighted version of (1). The latter is slightly more complex. It tells, firstly, that an increase in the flows from inactivity to employment decreases the unemployment rate, while an increase in flows from inactivity to unemployment increase it. Secondly, an increase in transitions from unemployment to inactivity decreases the unemployment rate, but an increase in the transition rate from employment directly to inactivity increases it.

The weight, α, is a measure of the relative importance of flows via inactivity, and can be written as (ibid.)

$$\alpha = \frac{h_{ie}h_{ui} + h_{iu}h_{ei}}{h_{ie}(h_{ui} + h_{eu} + h_{ue}) + h_{iu}(h_{ei} + h_{eu} + h_{ue})} \tag{3}$$

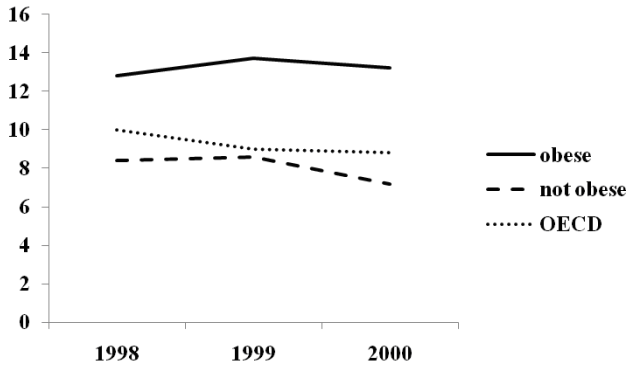
α is zero if all flows between unemployment and employment are between these two states and unity if all flows between unemployment and unemployment are through inactivity. These decompositions are used to identify the most important flows accounting for the obesity gap in female unemployment.

The objective of this first step is to identify the relevant dynamics that produce the obesity gap in female unemploy-

[4] See http://ec.europa.eu/eurostat/ramon/nuts/

ment rates. In the second step, we analyse these dynamics in more detail. An appropriate method for transition data is event history (or survival / hazard regression) analysis. We analyse the transition data using discrete time event history models (Yamaguchi 1991), which rely less on assumptions of functional form than continuous time models (such as Cox-regression), are more practical in dealing with time-varying independent variables (all in our case), and provide flexible means for handling ties in the data (more than one event per time unit). We arranged the data into a person-month format, that is, each woman in our sample has an entry for each month she is in the origin state (for example, unemployment) and an entry for the month when she moved to the destination state (for example, employment). Such data can be analysed with usual logistic regression models, where the dependent variable is unity for the month when the event (transition) takes place, and zero otherwise.

Figure 1. The obesity gap in female unemployment in Finland: own estimates from the ECHP and OECD unemployment rate estimates, women aged 25-54 years, 1998-2000 (%)



Sources: Eurostat (2003) European Community Household Panel, waves 6-8, weighted annual data. Women aged 25-54 years; OECD (2001) Employment Outlook.

Results

Unemployment rates and dynamic decomposition Figure 1 shows the unemployment rates (in the period 1998 to 2000) for obese and non-obese women aged 25 to 54 years in Finland, and compares these to OECD unemployment rate estimates for the same age group of women during the same period (OECD 2001). The Finnish ECHP returns slightly lower unemployment rates than those calculated by the OECD (up to 1.1 percentage points, depending on the year). Otherwise, the figure shows the already familiar result pointing to a higher unemployment rate among obese than non-obese women. Obese women also have a constantly lower labour force participation rate than non-obese women (the three-year averages being 78.9 percent and 87.2 percent, respectively).

In Table 2, we turn to the equations presented above to decompose the obesity gap in unemployment to its dynamic components. The first six columns show the monthly transition rates between employment, unemployment, and inactivity. The next three columns show the components of the steady state unemployment rate as in equation (2). Column 7 tells what the unemployment rate would be were there only flows between employment and unemployment, and Column 8 gives the estimated unemployment rate with flows only via inactivity. α gives the relative importance of the flows via inactivity for the unemployment rate, Column 10 shows the implied steady-state unemployment rate from equation (2), and for comparison, the last column displays the actual unemployment rate calculated using the self-reported monthly measure (which is different (higher) from the ILO measure used in Figure 1). The implied rates are in both cases lower than the actual rate, which is not surprising given the non-steady state of Finnish labour markets at the turn of the millennium. The obesity gap is also larger according to the self-reported measure than the ILO measure.

The figures in Table 2 show that there are some differences in flows between labour market statuses between obese and non-obese Finnish women. The three biggest gaps in transitions rates are, in order of magnitude, in the transition from inactivity to employment (non-obese women are approximately three times more likely to move from inactivity to employment than obese women), from employment to inactivity (non-obese women are twice as likely to make this transition), and from unemployment to employment (non-obese women's transition rate is 1.6 times higher). The three other gaps are relatively minor.

We can also see that α, the share of the female unemployment rate that is due to flows between employment and unemployment via inactivity is rather small and the two component unemployment rates (Columns 7 and 8) are very similar in both cases. These results altogether suggest that inactivity

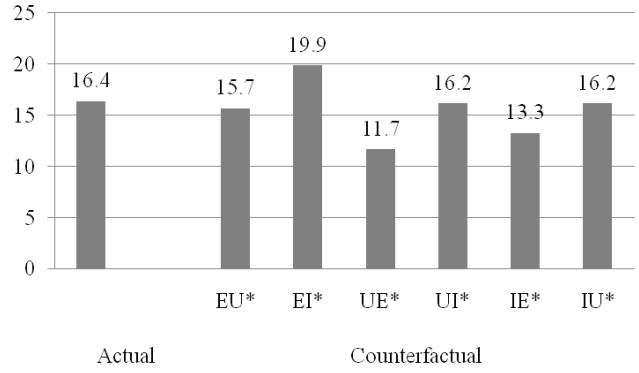
Table 2
Dynamic decomposition of the obesity gap in female unemployment, monthly transitions, % (standard errors in parentheses).

	$E \to U$	$E \to I$	$U \to E$	$U \to I$	$I \to E$	$I \to U$
	(1)	(2)	(3)	(4)	(5)	(6)
Obese	0.98	0.78	5.25	2.67	1.20	0.95
	(0.14)	(0.12)	(0.74)	(0.52)	(0.19)	(0.17)
Not obese	0.91	1.56	8.54	2.85	3.80	0.89
	(0.04)	(0.06)	(0.43)	(0.25)	(0.14)	(0.07)

	U-rate (no inactivity)	*U-rate (only inactivity)*	α	*Implied steady-state U-rate*	*Actual U-rate, monthly data*
	(7)	(8)	(9)	(10)	(11)
Obese	15.7	18.8	0.23	16.4	15.2
Not obese	9.6	11.4	0.22	10.0	8.5

Source: Eurostat (2003) European Community Household Panel, waves 6-8, weighted data. Women aged 25-54 years.

Figure 2. Counterfactual analysis of the relevance of the different transition rates: The implied steady-state unemployment rate for obese women and counterfactual rates, when transition rates equal those for non-obese women, %.



Source: Eurostat (2003) European Community Household Panel, waves 6-8, weighted annual data. Women aged 25-54 years.

plays a limited role in accounting for the obesity gap in female unemployment. This is not to deny the differences in, for instance, transition rates from inactivity to employment or vice versa. It is only to say that the differences do not play a large role in producing the difference in unemployment rates.

This general conclusion is assessed further in Figure 2, where we create counterfactual implied static-state unemployment rates for obese women (Column 10 in Table 2) by replacing the transition rates of obese women with those of non-obese women. We do this separately for each transition rate to assess their relative importance. We can see that the counterfactual implied steady-state unemployment rates for obese women are rather close to the ones reported in Table 2 in three of six cases. The transition rates between employment and inactivity work in the opposite directions; the lower transition rates from employment to inactivity for obese women reduces their unemployment rate whereas their lower transition rate in the other direction increases it. The differences between the actual and estimated counterfactual rates are approximately three percentage points. The difference in transitions from employment to inactivity all but disappears and becomes non-significant after controlling for age, education, children, marital status, year, health, and region (not shown). The difference in the opposite transition remains, however. This result may point to lower self-control or a lower interest in work; alternatively, it may point to a high proportion of discouraged workers among obese economically inactive women or lower chances of entering work without an intervening unemployment spell. The finding of minor obesity gaps in transitions between unemployment and inactivity rather support the latter explanation.

Given space limitations, we do not analyse this interesting issue further. Instead, we turn to the obesity gap in transitions from unemployment to employment, which is the biggest contributor to the gap in unemployment rates. This is also

interesting theoretically, as it may reflect difficulties in finding work (when wanting one and looking for one) due to employer discrimination/prejudices, and it is socially important, since low transition probabilities reflects an increased probability of long-term unemployment.

We perform the further analyses in three parts, first by analysing the gap in this transition rate with event history models, second by comparing the job search behaviours of obese and non-obese women, and finally with an indirect test of employer behaviour.

Event-history analysis of transitions from unemployment to employment. We first use discrete time event history models to analyse the transitions from unemployment to employment (Table 3). The purpose of this exercise is to analyse whether the relationship between obesity and this transition is spurious and disappears after we control for age, education, marital and cohabitational status, number of children, presence of a child under three years old, health status, region of residence, and calendar year.

The first model includes obesity status as the only independent variable. The estimate is statistically significant and negative, implying that obese women have a lower exit rate from unemployment to employment. When we enter the control variables in Model 2, the estimate becomes less significant. The size of the estimate also decreases by approximately one fourth. However, if we are willing to accept the significance level of the estimate (10 percent), obese women have an approximately 25 percent ($e^{-0.299}$– 1) lower chance of exiting unemployment for employment at a given point in time than non-obese women, when other relevant variables are held constant. When we used weighted data (not shown), the estimate was larger (-0.360) and significant at the 5 percent level. The results show that the link between obesity and the chances of getting a job if unemployed cannot be explained through selection by different (observed) characteristics. The results also suggest that the link can be causal in nature. In the following, we analyse possible mechanisms that may produce this effect.

Obesity and job search. The obesity gap in transition rates from unemployment for employment among women may result either from differences in job search behaviour between the groups or differences in employers' willingness to hire women based on their BMI. We will next look into the former, which is easier to examine with the data at hand. Unemployed obese women may differ from their non-obese peers in their job search patterns by their job search intensity, the standards they give to possible jobs, or the methods they use for job search.

Table 4 presents some job search related data among unemployed women, by obesity status. These data are based on the annual interviews and thus could not be linked to the monthly analyses above. Judging from the first three variables, there are only minor, if any, differences in job search among obese and non-obese women. The share of unemployed women who have contacted a public job search agency is high regardless of obesity status[5]. Neither do obese or non-obese women show differences in the hours they wish to work[6] or their self-reported reservation wages[7].

However, a comparison between the gap in reservation wages and actual wages is more important than a comparison between reservation wages as such. If employers discriminate against obese women by paying them less than non-obese workers, obese workers may face a gap in offered and desired wages and thus be less willing to accept job offers. Indeed, the fourth row does support this hypothesis. Obese women receive lower entry wages (wages of women who began working within a year and were unemployed before the current job, see Gregg and Wadsworth (2000)) than non-obese women. However, this difference becomes non-significant when the controls are entered into the equation (coefficient size –0.066, robust standard error 0.069).[8]

[5] Unfortunately, with the data at hand it is not possible to examine whether obese women differ from non-obese women in other forms of job search (for example, the number of applications sent) or whether they have access to or use different job search methods. Regarding the latter, it is possible, for instance, that due to their generally weaker ties to employment and/or discrimination, obese women have less access to social networks that facilitate finding a job (on social networks and job search, e.g., Granovetter 1974).

[6] The question in the ECHP is "Assuming you could find suitable work, how many hours per week would you prefer to work in this new job?"

[7] The question in the ECHP is "Minimum monthly income the person would accept to work the number of hours indicated".

[8] This result would also suggest that employer discrimination in wage offers is an unlikely explanation for the obesity gap in wages. However, the cells sizes used for the estimation are not very big (40

Table 3
The obesity gap in monthly transitions from unemployment to employment, discrete-time event history analysis.

	Model 1, no controls		Model 2, with controls	
	b	*s.e.*	*b*	*s.e.*
Not obese (BMI<30)	Ref.		Ref.	
Obese (BMI>=30)	-0.406	0.162*	-0.299	0.169†
25-34 years			Ref.	
35-44 years			-0.262	0.144†
45-54 years			-0.421	0.159**
High education			Ref.	
Middle education			-0.170	0.136
Low education			-0.418	0.162*
Married			Ref.	
Cohabiting			0.267	0.156†
Single			-0.287	0.186
Number of children			0.061	0.061
Child < 3 yrs. (dummy)			-0.413	0.236†
Bad health (dummy)			-0.647	0.373†
Uusimaa			Ref.	
Southern Finland			-0.020	0.166
Eastern Finland			0.079	0.186
Mid-Finland			-0.025	0.189
Northern Finland			-0.317	0.246
1998			Ref.	
1999			-0.012	0.137
2000			0.380	0.134**
Constant	-2.186	0.059*	-1.955	0.225***
N person-months	3823		3807	
Log-likelihood	-1200.933		-1169.852	

Source: Eurostat (2003) European Community Household Panel, waves 6-8. Women aged 25-54 years.
*Significance levels: † p<0.10; * p<0.05, ** p<0.01; *** p<0.001*

Table 4
Job search among unemployed obese and non-obese women

	Obese		Not obese		*Sig.*
	Mean	*s.e.*	*Mean*	*s.e.*	*of differ.*
Contacted public employment agency	84.3	4.44	81.5	2.19	n.s.
No. hours wish to work	38.1	0.81	37.0	0.38	n.s.
Reservation wage (logged, FIM, monthly)	8.56	0.96	8.53	0.11	n.s.
Entry wage (logged, FIM, monthly)	8.21	0.07	8.48	0.03	p<0.05
Expect chances of finding job bad or very bad	59.1	6.00	45.0	2.82	p<0.05
Received job offers in past four weeks	10.7	3.77	16.0	2.07	n.s.

Source: Eurostat (2003) European Community Household Panel, waves 6-8, weighted data. Women aged 25-54 years, annual data.

Obese and non-obese women differ in their subjective expectations of finding a suitable job (fifth row).[9] This difference remains statistically significant at the 5 percent level after the controls are entered (coefficient estimate 0.614, robust standard error 0.305). In other words, obese women are less hopeful than non-obese women in their chances of finding a job, regardless of their observed characteristics. This may reflect experienced difficulties in finding a job or knowledge of the labour market in which obese women are discriminated. Related to this, the sixth row shows how obese women were less likely to receive job offers during the past four weeks. However, possibly due to small cell sizes, the difference is not statistically significant.[10]

The conclusion of this analysis is that differences in reservation wages, the gap between reservation wages and offered wages, or job search methods do not explain the obesity gap in unemployment durations. In other words, obese women are not different from non-obese women when it comes to job search behaviour. They are, however, less wishful of finding a job they are looking for, possibly reflecting knowledge of a discriminatory labour market. In the following, we perform some indirect analyses of discrimination against obese women.

Characteristics of regional labour markets and the obesity gap in unemployment durations. Direct evidence on weight discrimination by employers cannot be attained with the data at hand: that would require data on employers or data on recruitment decisions. Instead, we can seek to analyse these questions indirectly. For instance, if employers prefer hiring non-obese women instead of obese ones, this would lead one to expect that employers' chances of acting according to such preferences are higher when unemployment rates are high and job queues longer. One could also expect that employers hire obese women more likely in an obese labour market. In other words, the more obese workers in a labour market, the higher the chances that any single obese worker finds a job. This could happen if obesity increasingly becomes a norm and employers soften their attitudes towards obese workers. Furthermore, obesity is a stronger signal in labour markets with fewer obese workers. The opposite may also be true. Increasing obesity may in fact benefit the chances of non-obese women, as slimmer workers are harder to find. Increasing obesity has arguably also increased awareness of its health and other problems in the Western countries. This may translate to stronger prejudices against obese workers.

In Table 5 we present results from three models that examine these issues. We enter estimates of regional (quarterly) unemployment rates and regional (annual) rates of obese women and their interactions with obesity status of the respondent as explanatory variables in the event-history models reported in Table 3. The regional unemployment and obesity rates are centred to their regional-quarterly mean levels. As in Table 3, we also include the fixed effects of the region of residence of the respondent and year. We correct for the multi-level structure of the data by calculating robust standard errors using the regions as clusters.[11] Due to space considerations, we only report the estimates of obesity status, the regional unemployment rate, the regional obesity rate, and their interactions.

The first model enters the regional unemployment rate and its interaction with obesity. Unlike expected, the obesity gap seems to widen as unemployment rates fall. This result remains in the third model, where the interaction between obesity status and regional obesity levels is controlled. The latter interaction is significant, and in the expected direction in the second model (without the interaction between obesity status and regional unemployment levels): obese women appear less disadvantaged in more obese labour markets. However, the association loses its significance in the third model. This suggests that the initial interaction effect is spurious, and results from the positive interaction between the regional labour market (measured as unemployment rates) and obesity status. Indeed, cross-sectional regional unemployment

for obese women), and a strong conclusion cannot thus be made.

[9] The question in the ECHP is "How good or bad do you think that your chances of finding the kind of job you are looking for within the next 12 months?".

[10] The difference became nearly significant at the 5 percent level, when the analysis was performed with a sample of all working age women. The difference became non-significant after introduction of the control variables. Obese women were also more likely to have declined a job offer, even though this difference was not statistically significant, reflecting small cell sizes. The difference remained non-significant even in the sample of all working-age women.

[11] This is done using the cluster –option in STATA.

Table 5
Interactions between obesity status and regional unemployment rates and regional obesity rates in models for monthly transitions from unemployment to employment.

	Model 1		Model 2		Model 3	
	b	s.e.	b	s.e.	b	s.e.
Obese	-0.236	0.127†	-0.135	0.174	-0.198	0.118†
Regional unemployment rate	-0.119	0.049*			-0.140	0.055*
* obese	0.173	0.008***			0.169	0.010***
Regional obesity rate			0.015	0.063	0.087	0.066
* obese			0.116	0.057*	0.032	0.029
N events						
N person-months	3807		3807		3807	
Log-likelihood	-1163.418		-1168.608		-1162.624	

Source: Eurostat (2003) European Community Household Panel, waves 6-8. Women aged 25-54 years.
*Significance levels: † p<0.10; * p<0.05, ** p<0.01; *** p<0.001*

rates and regional obesity rates are positively related.[12]

However, the sign of the interaction term between obesity and regional unemployment rates is opposite to that initially expected. A possible explanation for this result may, paradoxically, also include employer preferences. It may be that—at least in times of falling, yet still high, regional unemployment rates such in the Finnish case at the turn of the millennium—employers rank job applicants with similar human capital characteristics according to physical appearance so that slimmer candidates occupy the first places. These slimmer candidates may also be the ones first benefiting from more favourable economic conditions at the expense of the obese. Although a possible explanation, the issue warrants further investigation.

Conclusions and discussion

Obese women suffer labour market penalties, which have been documented in several studies across many countries. In this article, we have analysed one such penalty: the higher unemployment rates of obese than non-obese women in Finland. This gap is important in its own right, and since part of the wage penalty experienced by obese women works through lower job tenure (Härkönen & Räsänen 2008), analysis of the obesity gap in unemployment helps in understanding the broader labour market penalties experienced by obese women and gives the possibility to shed light on the roles of worker and employer behaviours in producing these penalties.

This paper presents the first dynamic analysis of the obesity gap in female unemployment. The approach proved fruitful. The results showed that the most important single dynamic component that contributes to the gap in unemployment rates is the gap in transitions from unemployment to employment. We also found differences in transitions between employment and inactivity, which worked in the opposing directions: both transition rates are lower for obese women.

We focused our further analyses on the transitions from unemployment to employment. The analyses ruled out some possible explanations. Firstly, an obesity gap in unemployment durations is not due to differences in (observed) background factors. Secondly, the results did not support the hypothesis that obese women differ in any important way from non-obese women in terms of job search behaviour. They had, however, less hopes of finding work, possibly reflecting knowledge of their possibilities in the labour market. Thirdly, the finding that obese women do not have lower employment exit rates than non-obese women casts into doubt the hypothesis that obese women are less productive workers than non-obese women. Also, even though obese women have lower transition rates from inactivity to employment,

[12] When analysed with weights, the interaction between regional obesity rate and obesity status was already not significant in the second model. Otherwise, the conclusions remained the same.

the finding that there is only a minor gap in transitions between inactivity and unemployment counters the hypothesis pointing to traits and behaviours of obese women. These findings are left for future research. Fourthly, since obesity reduces transitions from unemployment to employment, and obesity status remained rather constant in the data, endogeneity is not a likely explanation (cf. Conley & Glauber 2007, who reported an 18 percent wage gap for American women when obesity status lagged by 15 years).

Our results suggest that the behaviour of employers was more important in accounting for the obesity gap. If employers have distaste for obese female workers, the obesity gap in unemployment exit could be expected to be higher when unemployment rates are higher, job queues longer, and employers can choose from a larger pool of job applicants. The results did not support this hypothesis. In fact, the relationship was the opposite. A possible explanation put forward is that a rising tide does not lift all boats alike. Instead, improving labour market conditions can affect the employment prospects of non-obese women faster than those of obese women. This may also have to do with employer preferences: when demand for labour increases, employers first offer job possibilities to workers who hold favoured characteristics, such as relatively low body mass.

While a research setting such as this one cannot definitely prove that employers discriminate against obese women, it is useful to keep in mind that employer discrimination is maybe the most common explanation given to the adverse labour market effects of obesity for women (e.g., Pagán & Dávila 1997; Cawley 2004; Garcia & Quintana-Domeque 2007; Conley & Glauber 2007; Härkönen & Räsänen 2008). Why this is so, is a relevant question for future research. A plausible hypothesis is that employers use body weight as a signal for health problems and other causes of lower productivity (such as low self-control (cf. Cutler et al. 2003)).

Any explanation of female obesity penalties has to acknowledge the fact that men do not suffer such penalties. Therefore, the explanation needs to be gendered. A good working hypothesis is that these penalties have to do with cultural codes that govern the attitudes towards male and female body weight and beliefs of the traits and characteristics of women (but not of men) who do not fit into these ideals.

The increasing obesity rates in Finland and other countries are likely to create inequalities both among women and between women and men and also through other channels than the labour market (such as the marriage market (e.g., Harper 2000; Conley & Glauber 2007)). These consequences are additional reasons why both obesity and the cultural codes and practices regulating its perception warrant attention, both by scientists and policy makers.

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