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# Childbearing and psycho-social work life conditions in Sweden 1991-2000

## **Childbearing and psycho-social work life conditions in Sweden 1991-2000\***

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## **Abstract**

In Sweden, a dramatic fall in fertility coincided with recession and high unemployment during the 1990s. Recent research has shown that the precarious labor market has been one factor contributing to women postponing family formation. Studies have also shown that during the 1990s, the degree of negative psycho-social stress in work life increased in certain trades (care and education, and commerce) which are dominated by female employees. In the present paper, I focus on the interaction between psycho-social work conditions as defined by Robert Karasek and the likelihood of childbearing. As data material, the Swedish Level of Living Surveys of 1991 and 2000 are used. The research questions are: (1) Does job strain affect the likelihood of having the first, second and third child? Are there any differences between women and men? (2) Are there any differences in the likelihood of having children between individuals employed in trades characterized by high levels of jobs strain vs low levels of job strain? Are there any differences between men and women? The results indicate that women working in high-strain jobs have a lower likelihood of having the first child compared with women working in low-strain jobs, even when several important factors are controlled for. No significant associations between job strain and the timing of the second and third child are found for women. For men, no significant associations between job strain and the births of children are found, at least not when relevant controls are made. Analyses of childbearing and trade indicate that women working in commerce are more likely to have their first child compared with women working in manufacturing. For men, the results indicated that those working in public service are more likely to enter fatherhood compared with men working in manufacturing.

## **Sammanfattning**

I Sverige sammanföll under 1990-talet en dramatisk nedgång i födelsetalen med lågkonjunktur och hög arbetslöshet. Tidigare forskning har visat att en osäker arbetsmarknadsanknytning är en faktor som bidragit till att kvinnor skjutit upp barnafödande. Empiriska studier har visat att den negativa stressen ökade inom vissa kvinnodominerade branscher under 1990-talet; nämligen vård och utbildning, samt handel. Syftet med denna uppsats är att undersöka sambanden mellan barnafödande och psykosociala arbetsförhållanden som de definieras av Robert Karasek. Som datamaterial används Levnadsnivåundersökningen 1991 och 2000. Frågeställningarna är: (1) Påverkar de psykosociala arbetsförhållandena sannolikheten att få det första, andra och tredje barnet? Finns det skillnader mellan män och kvinnor? (2) Finns det skillnader i sannolikheten att få barn mellan individer anställda i branscher som karaktäriseras av olika psykosociala arbetsförhållanden? Finns det skillnader mellan män och kvinnor? Resultaten visar att kvinnor som arbetar i högstressjobb har en lägre sannolikhet att få sitt första barn jämfört med kvinnor som arbetar i lågstressjobb, även när man kontrollerar för olika relevanta faktorer. Däremot finns det för kvinnor inget samband mellan psykosociala arbetsförhållanden och sannolikheten att få andra eller tredje barnet. För män finns det inget samband mellan psykosociala arbetsförhållanden och sannolikheten att få första, andra eller tredje barnet, åtminstone inte när man kontrollerar för olika relevanta faktorer. Analyser av sambanden mellan barnafödande och att arbeta i en viss bransch visar att kvinnor som jobbar inom handel har en större sannolikhet att få sitt första barn jämfört med kvinnor som arbetar inom tillverkningsindustrin. För män indikerar resultaten att de som arbetar inom offentlig tjänster har en större sannolikhet att få sitt första barn jämfört med män som arbetar inom tillverkningsindustrin.

## 1. INTRODUCTION

For the most time since World War II, Sweden has been a society enjoying almost full employment. However, during the early 1990s Swedish unemployment increased to conspicuously high levels<sup>1</sup> and a period of mass unemployment and severe recession began. During the same period, a dramatic drop in fertility occurred. A total fertility rate of 2.1<sup>2</sup> in 1990 (Statistics Sweden 1992) had dropped to about 1.5 by 1997, the lowest level ever recorded<sup>3</sup> (Statistics Sweden 1998). In particular it became increasingly common among Swedish women, and especially among women under 30, to postpone the birth of the first child (Statistics Sweden 1998). Among Swedish women, deferment of the first birth has been gradually developing since the end of the 1960s (Santow and Bracher 2001). Previous cohorts have however been able to compensate for this deferment later. Although in a comparative perspective Sweden has experienced greater fluctuations in fertility levels than many other countries (Söderström et al. 1999), the question has thus been when rather than if to have children. However, since the average age of entry into parenthood has been rising steadily, it may not be possible to compensate fully for the postponements of the 1990s at a later stage, something which naturally will have great impact on the demographic composition of the population in a future perspective.

As was indicated above, there is a strong interaction between childbearing, labor supply, and labor market. Recent research has shown that the precarious labor market has been one factor contributing to women postponing family formation during the 1990s (Andersson 2000; Statistics Sweden 2001). However, the work life-related part of whether and when to have children is perhaps not only a question of being temporary or permanently employed, but also a question of other job characteristics. Whether or not the psycho-social work climate has deteriorated during the 1990s has been subject for discussions. A study based on Level of Living data (le Grand et al. 2001) indicates that during the 1990s, the degree of negative psycho-social stress in work life increased in certain trades (care and education, and commerce) which are dominated by female employees. Other studies (Bekkengen 2002; Klinth 2002) indicate that men's work life is not as affected by the births of children as women's work life is. However, fertility research is very women-oriented while studies that also include men or couples are much sparser. In the light of this, it appears important to pay special attention to gender differences.

A common way to measure work life conditions is to use Robert Karasek's (1979; Karasek and Theorell 1991) job strain model. This model assumes that job strain results from different combinations of job demands and decision latitude, rather than from a single aspect of the work environment only. The aim of this study is to explore the relation between work life conditions as defined by Karasek's model, trade, and childbearing in Sweden during the period 1991-2000. Although the relation between work life and childbearing is a well established research area, the associations between job strain and the likelihood of having a child are hardly explored at all (see however Hjollund et al. 1998). In this study, special attention will also be paid to gender differences. The research questions are:

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<sup>1</sup> The unemployment rate increased from a level of 2.7 percent in 1991 to 5.2 percent in 1992 and 8.2 percent in 1993 (AKU 1996a; 1996b; 1996c).

<sup>2</sup> The total fertility rate (TFR) is defined as the number of children that women would have on average, if the fertility rate for each age group in a given year were to persist in the future.

<sup>3</sup> Swedish population statistics have been recorded since 1749.

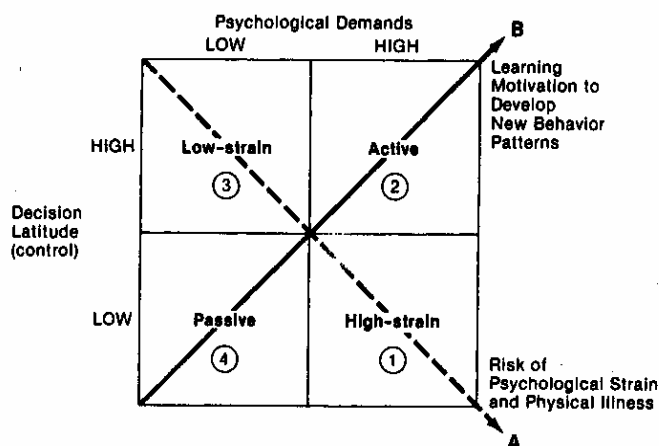
- (1) Does job strain affect the likelihood of having the first, second and third child?  
If so, are there any differences between women and men?
- (2) Are there any differences in the likelihood of having children between individuals employed in trades characterized by high levels of jobs strain vs low levels of job strain? If so, are there any differences between men and women?

As data material, the Swedish *Level of Living Surveys* of 1991 and 2000 will be used. The next section deals with theory and previous research on childbearing and work life conditions. This is followed by a description of the data materials and methods. The third section presents the results. The paper is closed by a discussion.

## 2. CHILDBEARING AND PSYCHO-SOCIAL WORK LIFE CONDITIONS

The job strain model developed by Robert Karasek (1979, Karasek and Theorell 1991) is a commonly used tool to assess work life conditions. This model combines two dominating perspectives on the psycho-social meaning of work. The first perspective focuses on qualification level and decision-making freedom (see e.g. Hacker 1973). This school was developed mainly by German psychologists, and take Karl Marx' alienation theory as point of departure. The second perspective, developed by Swedish and American sociologists and psychologists (see e.g. Gardell 1971; 1976), deals more with psychological demands. Of main interest here are variations in mental health. Karasek's model takes as its point of departure the hypothesis that psychological strain cannot result from a single aspect of the work environment only, but rather "from the joint effects of the demands of a work situation and the range of decision-making freedom (discretion) available to the worker facing those demands" (Karasek 1979, p. 287). Job demands and decision latitude (skill discretion and job control) together defines the composite measure job strain. According to the model, increased job demands relative to decreasing job decision latitude produce increased strain. The model predicts four different types of jobs: high-strain, active, low-strain, and passive.

Figure 1.



Source: Karasek and Theorell 1991, p 32.

High job demands in combination with low decision latitude create high-strain jobs. This job type is hypothesized to be highest in psycho-social health risk. The high demands in combination with little decision-making freedom create a situation where the readiness to cope with challenges is high, but the opportunities to do so are scarce. The result is, according to Karasek, unused energy, which in turn results in poor psychological well-being and circulatory difficulties. High strain jobs are dominated by females. Examples of such jobs – based on analyses of American data (Karasek and Theorell 1991, pp 40-44) – are low-status service operatives such as waiter or cook. Active jobs are characterized by high job demands as well as high job decision latitude. The jobs in this category give the highest incomes, and the highest job satisfaction. It is predicted that this type of job lead to a new behavior both on and off work, and an active leisure-time. The psycho-social outcome is a high degree of learning and growth, which is associated with high productivity. The energy is here turned into action. Active jobs are often high-prestige jobs, and are dominated by males: lawyer, physician, engineer, etc.<sup>4</sup>

Low-strain jobs, which are low on psychological demands and high on job decision latitude, have been described as a “psycho-social paradise” (Karasek and Theorell 1991, p 42). This job type produces below average levels of residual psychological strain. Individuals who have low-strain jobs are predicted to have average levels of political and leisure activity. An example of low-strain job is repairman. Finally, passive jobs are created by a combination of low psychological demands and low job decision latitude. This job type is predicted to lead to a decline in overall activity, both on and off work. According to Karasek and Theorell “...a gradual atrophying of learned skills and abilities may occur” (1991, p 37). In terms of psycho-social work problems, passive jobs hold the second position after high-strain jobs. The predictions are below average levels of leisure and political activity, and “long-term loss of motivation and productivity” (Karasek and Theorell 1991, p 38). Individuals in passive jobs are hypothesized to have average levels of psychological strain and illness. Typical passive jobs are sales clerks, billing clerks, and transport operatives.

One ambition with the demand-control model is to provide objective measures. The most common way to measure job demands and decision latitude is to use self-reported questionnaires. Obviously, measuring the dimensions through self-reported questionnaires introduce a risk of bias. Tests have however indicated that the overall validity<sup>5</sup> is acceptable, although it differs somewhat between the dimensions. While decision latitude is characterized by high validity, measures of psychological demands have been shown to have lower validity (Karasek and Theorell 1990, pp 78-81). The aim of providing objective measures has however also been subject to criticism at other levels than that of validity (for a discussion, see Frese and Zapf 1988). It is highly plausible that different individuals will respond differently to the same combination of demands and control. It has also been pointed out that jobs differ in their demand of emotional involvement. These critics are all valid. However, I have chosen to use the demand-control model in this study because, despite of its deficits, it has proven to be an excellent way to measure work life conditions (see e.g. Åberg 1984; Szulkin and Tåhlin 1994; le Grand et al.

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<sup>4</sup> However, it also seems plausible that high job demands in themselves may cause poor psychological well-being regardless of decision latitude, at least when the job demands are extreme.

<sup>5</sup> In the sense of individuals’ perceptions of psycho-social work life conditions, rather than differences in how individuals react to psycho-social work conditions.

2001), and because it provides opportunities to relate the results of this study to previous research on Swedish data from the 1990s.

Let us now take a closer look at the theoretical arguments behind the core of this study: the relationship between stress in work life and the probability of having a child or children.<sup>6</sup> The biological aspects of stress (which is likely to be related to job strain) are well-documented (Istvan 1986). In relation to this, it has also been suggested that stress is associated with reproductive ability.<sup>7</sup> However, there are other aspects than biological of the relationship between stress and fertility. This study is concerned with the individual not so much as a biological creature, but rather as a social creature.

There are a number of reasons why stress in work life should affect the decision to have children in a negative direction. One corner stone of Karasek's model is that the degree of job strain is correlated with several other important aspects of the job, such as salary, terms of employment, and career opportunities etc (Karasek and Theorell 1990 pp. 40-44). It seems reasonable to assume that individuals or couples postpone the births of children to a point in their lives when these factors are satisfying. This would also apply to other aspects of adulthood (see also Hobcraft and Kiernan 1995), such as education and housing. Previous research based on Swedish data has indicated that female income (Andersson 2000; Hoem 2000) and terms of employment (Statistics Sweden 2001) are factors related to the propensity to have the first child. It has also been argued that men with high incomes and presumably also "good jobs" are more attractive on the marriage market compared with their counterparts, although the empirical evidence for this is contradictory (Richardson 2000). It is also plausible that individuals, depending on what job they have, defer childbearing because having a child might increase the risk of getting fired. Only one study (Hjollund et al. 1998) has to my knowledge focused on the relationship between job strain and the likelihood of pregnancy itself.<sup>8</sup> Overall, Hjollund and associates find that the level of job strain is negatively but insignificantly related to fecundability. However, when the analysis is restricted to couples without any known causes of reduced fertility it is indicated that women in high strain jobs have reduced odds (odds ratio 0.4, confidence interval 0.2-1.0, Hjollund et al.

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<sup>6</sup> It should however be stressed that preferences probably is the most decisive factor in the timing of births and number of children. It seems reasonable to assume that individuals or couples will have children if they want to have children, as long as the external and internal possibilities are available – such as a partner and the biological possibilities to have children. However, certain categories of individuals and couples will be more affected by external factors, such as work life conditions, in their decision if and when to have children. In addition, there is also the intriguing question of whether preferences might actually be influenced by factors such as finding a suitable partner.

<sup>7</sup> For example, stress may affect the central nervous system, the autonomic nervous system, the endocrine system, and the immune system (Brink Henriksen 1999; Hjollund et al. 1998), and for men potency, sperm quality and sperm counts (Salvage et al. 1998). The question of cause or consequence is however central in this context. Does stress cause problems with reproductive health, or does problems with reproductive health cause stress?

<sup>8</sup> A number of studies use Karasek's model to study questions related to births but not births in themselves, such as spontaneous abortions (Fenster et al. 1995; Brandt and Nielsen 1992), preterm delivery and birthweight (Tuntiseranee et al. 1999; Brink Henriksen et al. 1994; Brandt and Nielsen 1992; Homer et al. 1990), small for gestational age (Tuntiseranee et al. 1999), stillbirths, deaths within the first year, and congenital malformations (Brandt and Nielsen 1992). Although none of the studies can indicate that work life conditions affects reproductive outcome overall, several indicate that a positive association between job strain and various adverse pregnancy outcomes does exist among certain groups of women. There are also some studies of relevance that examine the relationship between stress and reproduction without using Karasek's model (Messing et al. 1992; Harlow and Matanoski 1991; Schenker et al. 1997).

1998, p 346) for becoming pregnant compared with women in other jobs. Considering the societal similarities between Sweden and Denmark, the results of Hjollund et al. and the results presented in this study should be comparable to a large degree.<sup>9</sup>

*H1a Job strain is negatively related to the likelihood of having children*

Stress in work life might however also have positive influences on the likelihood of having children. The birth of a child and parental leave might be regarded as an appreciated break from a job with high strain. The results by Britta Hoem (SOU 2000:37) could be interpreted in this way. She found that women educated to work in sectors where the negative stress according to le Grand et al. (2001, see below) increased most during the 1990s – care and education – are also those with the highest probability of childbearing during the same period. This is probably at least partly a reflection of preferences in different groups. In other words, women who chose jobs like nurses aids or pre-school teachers are perhaps more likely than other women to be family oriented to begin with. Under these circumstances, and in particular when the alternatives on the labor market are scarce, childbearing and childrearing might be considered an alternative career.

*H1b Job strain is positively related to the likelihood of having children*

An important question – in particular with reference to the above finding that job strain has increased in typical female jobs during the last decade – is whether there are any gender differences. Let us first examine some reasons why we could expect gender differences. It is possible that men are less affected by negative stress in work life regarding fertility. One factor contributing to this is probably that men take parental leave to a lesser extent than women do (Klinth 2002). Further, choosing the role of family maker as an alternative to gainful employment is also likely to be more accepted for women than it is for men. However, it is also possible that the gender differences are small, if any. For example, choosing a traditionally male job and securing the role as provider might be linked to family orientation among men. Further, one might also question gender differences in the impact of work life conditions in a society regarded as comparatively gender equal.

*H2a Men are less likely than women to be affected by job strain in childbearing decisions*

*H2b Men and women are equally likely to be affected by job strain in childbearing decisions*

In addition, the discussion above also indicated that there are great differences between having the first child, and having subsequent children. The birth of the first child has greater social significance compared to the birth of subsequent children, since the step from being childless to becoming a parent involves great adjustments in numerous ways. In Sweden, the majority of couples that have one child subsequently have their second child (Ds 2001:57, p 113). Thus, the

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<sup>9</sup> However, it should also be stressed that the research strategy, and partly also the research questions, differ greatly between the present study and Hjollund et al. (1998). The differences will be discussed more thoroughly in section 5 *Discussion*.



births<sup>10</sup> of the first and second child are intimately related among Swedish men and women. Having a third (or higher-order) child is far more uncommon in Sweden (Ds 2001:57, p 115). Since different mechanisms influence the timing and social significance of the first, second and third child, it appears reasonable to assume that work life conditions also will differ in its influence on the timing of the first, second and third child.

*H3                    Job strain have greater impact on the timing of the first child compared with the second and third child*

A common assumption in the aftermath of the economic crisis of the 1990s has been that the work life conditions have deteriorated and that the degree of job strain has increased. As le Grand et al. (2001) however point out, it is quite common to regard the present to be a ground-breaking and dramatic period. An important question is therefore what changes of work life conditions and job strain actually took place during the 1990s. Using level of living data, le Grand et al. (2001) show that job strain have increased for all socio-economic groups during the 1990s except for unskilled manuals. The increase is however statistically significant only for care, education, and commerce, in other words trades dominated by female employees. The development in these trades is also characterized by decreased decision latitude during the 1990s. An interesting question thus appears to be whether any associations exist between the likelihood of having children and in which trade the respondents are employed.

*H4a                    Being employed in a trade characterized by high levels of job strain is negatively related to the likelihood of having children*  
*H4b                    Being employed in a trade characterized by high levels of job strain is positively related to the likelihood of having children*

To sum up, it has been concluded that there are arguments that support the hypothesis that job strain is negatively related to the likelihood of having children as well as arguments in favor of a positive relationship. It was also hypothesized that job strain has greater impact on the first birth compared with subsequent births. Further, it was hypothesized that the expected level of work-related stress in the trade in which one is employed affects the likelihood of having children. The importance of examining gender differences was also emphasized. Finally, it is worth repeating that, to my knowledge, only one previous study has focused on the association between job strain and the likelihood of pregnancy. Further, men have largely been ignored in the existing research.

### 3. DATA AND METHOD

As data the Swedish Level of Living Surveys (LLS) of 1991 and 2000 will be used. The LLS is a panel survey conducted the first time in 1968. The LLS collects complete work life and family biographies, and at each occasion also a large numbers of indicators on living conditions, housing conditions, health etc. The original sample 1991 consisted of 6733 individuals. The response rate was 78 per cent or 5306 individuals. The original sample 2000 was 6711 individuals, of which 5142 individuals or 77 per cent participated.

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<sup>10</sup> To some extent due to the so-called speed-premium, the spacing of the second child is also dependent on the timing of the first child (Hoem 1993).

In all, three different subsamples of the LLS for 2000 were selected. The following requirements were common: (1) The respondent had to have been interviewed in both 1991 and 2000. (2) The respondent had to be 45 years old or less in 1991. (3) The respondent had to be gainfully employed at the time of the interview in 1991. In addition to these requirements, the first subsample only included those who are childless at the time of the interview in 1991, while the second subsample only included those who have one child in 1991, and the third subsample only those with two children at the time of the interview in 1991. Thus, the three sub samples contain different individuals.

The focus in this paper is the transition from the childless state to parenthood over time, or the transition from having one or two children to having two or three children over time. The most appropriate way to study this transition is to use intensity regression. The dependent variable used in the empirical analyses is the hazard rate:

$$h(t / X(t)) = \lim_{\Delta t \rightarrow 0} \frac{P(t, t + \Delta t | T \geq t, X(t))}{\Delta t}, \quad (1)$$

where  $T$  is the month of the conception of the respondent's first, second, or third (biological) child, given that this child was born after the time of the interview 1991 but before the interview 2000,  $t$  is any fixed point in time under risk, while  $p(t, t + \Delta t)$  is the probability that the event occurs in the interval  $[t, t + \Delta t)$ , and  $x(t)$  is a vector of covariates, given that the event has not occurred before  $t$ .

The primary interest in this study concerns when children are conceived, rather than when children are born, since the job situation before the conception is likely to influence the decision. Changes of the job situation after conception can be either expected or unexpected, and the second alternative is unlikely to influence any decisions regarding the timing of births.<sup>11</sup> Subtracting ten calendar months from the time of the birth gives an approximate time of conception, allowing at least some time for conceiving. From here on, this will be referred to as the timing of births. Since the analytical unit is individuals rather than couples, the respondent's children are considered rather than the woman's children, which is standard fare in analyses of fertility. Regarding first children, in the majority of cases, the woman's first child is however also the man's first child, but a small proportion of men already has children with a previous spouse (see also Ström 2002). In other words, the partner of the respondent might have previous children with a previous spouse. Respondents reporting deceased children in either 1991 or 2000 are excluded, since information on the date of the child's death is missing. Respondents whose children are adopted are censored at the time of the adoption without recording the event of a birth, since the main interest concerns the timing of biological children. It should also be noted that the timing and birth of a child is regarded as a conscious decision. As is well known, this is not always the case. It is likely that a proportion of the births are unplanned. Moreover, it is likely that some of the respondents are involuntarily childless due to biological factors, or have made a conscious decision not to have children. All information regarding family situation is self-

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<sup>11</sup> During the first months of a pregnancy, the option of induced abortion is available. There is, however, no information on induced abortions in the LLS.

reported. Civil status and the respondent's birth data are derived from the 1991 survey. Information on children's births (calendar year and month) and birth orders is derived from the 2000.

Karasek's job strain model is operationalized by means of four variables (see also le Grand et al. 2001). The degree of job demands is defined by using the two following dichotomous questions: (1) Is your work mentally taxing? (2) Is your work stressful? The questions (3) Can you yourself determine your pace of work? (4) Is your work monotonous? are used to operationalize decision latitude. High psychological demands (a mentally taxing job) in combination with a high level of stress yield high job demands, while other combinations of the two variables yield low job demands. A high degree of variation and the freedom to decide work pace gives a high degree of autonomy, all other combinations yield low degree of autonomy. Four different types of jobs are thus possible: (1) high-strain jobs have high psychological demands and a low degree of autonomy; (2) active jobs have high psychological demands and a high degree of autonomy; (3) low-strain jobs are characterized by low psychological demands and a high degree of autonomy. (4) passive jobs are characterized by low psychological demands and a low degree of autonomy. Information on job strain and socio-economic position is derived from the surveys of 1991.

The analysis is performed in two steps. The first step makes use of the information about the job the respondent held at the time of the interview in 1991. The analysis attempts to test whether the degree of job demands and decision latitude in work life defined according to Karasek's job strain model (Karasek 1979; Karasek and Theorell 1991) is related to the likelihood of having the first, second or third child. The observation window opens at the interview of 1991, and closes at the timing of the first, second or third child (depending on which subsample is used), when the respondent departs from the job held in 1991, December the year when the respondent turns 45 years old, or at the time of the interview in 2000 (whichever comes first). This analysis is repeated for the first, second, and third child, and separately for women and men. In the second step, job strain is replaced by a variable measuring the trade in which the respondent was employed in at the time of the interview in 1991.

The analyses are limited to the period 1991-2000, in other words a short period before the severe economic crisis of the 1990s, the crisis, the recovery period, and a period subsequent to the crisis. Another restriction concerns information about the respondents' spouses. The ideal situation is naturally that the same amount of information as is available for the respondent also is available for the spouse. Unfortunately this is not the case here, although we have some information on the spouses' work life. Some general strengths and weaknesses with the material should also be discussed. The most obvious strength with the LLS is that it is a longitudinal material, which substantially increases the possibilities of drawing causal inferences. It has greater demographic dispersion compared with many other materials. Both men and women are included, as well as respondents from different socio-economic groups. The greatest disadvantage with the material is probably its relatively small sample size, which makes it difficult to divide the sample into more fine-tuned categories, e.g. regarding occupational titles. Keeping the purposes of this study in mind, it would also have been desirable to have information on demands and control for each individual job held 1991-2000, and not only the jobs held at the time of the interview.

#### 4. RESULTS

Descriptive statistics for the subsamples are shown in *Table 1*. In the case of work-life conditions, percentage of person-months is used as descriptive unit, while the remaining variables individuals are the unit of observation.

TABLE 1. *Descriptive statistics. Level of Living Survey 1991 and 2000*

Variable	First Child		Second Child		Third Child	
	Women	Men	Women	Men	Women	Men
<i>No of cases (individual level)</i>	161	216	135	106	267	210
<i>Person-months</i>	5,211	8,190	4,548	2,657	9,312	8,310
<i>Work Life Conditions (% of person-months *)</i>						
High-strain	22.5	12.7	27.7	16.3	27.3	10.1
Passive	23.2	25.0	24.0	21.0	19.6	18.2
Active	19.3	20.3	27.1	22.9	16.1	24.4
Low-strain	34.8	41.4	21.2	39.8	36.6	47.2
<i>Child Conceived (% of cases)</i>	32.9	22.7	25.2	34.0	9.3	13.3
<i>Age (% of cases)</i>						
18-29	48.4	44.4	24.4	23.6	7.5	9.5
30-45	51.6	55.6	75.6	76.4	92.5	90.5
<i>Married/Cohabiting (% of cases)</i>						
No	44.1	58.8	17.8	12.3	12.7	7.6
Yes	55.9	41.2	82.2	87.7	87.3	92.4
<i>Tenure (% of cases)</i>						
0-7 months	64.6	54.2	70.4	57.6	57.3	47.6
8 – months	35.4	45.8	29.6	42.4	42.7	52.4
<i>Educational Level (% of cases)</i>						
Below university degree	60.2	71.8	77.8	71.7	79.7	71.9
University degree	39.7	28.2	22.2	28.3	20.22	28.10
<i>Trade** (% of person-months)</i>						
Manufacturing and other	18.6	61.0				
Commerce	10.1	10.4				
Care and education	48.3	15.2				
Public service	3.7	4.0				
Other	19.3	9.4				

\* percentages not adding to 100 is due to missing values

\*\* manufacturing=SNI 3, 4, 5, 7; commerce=SNI 6; care and education=SNI 93; public service=SNI 91; other=SNI 1, 8, 9 except 91 and 93

Let us first take a closer look at the independent variable: job strain. The general pattern is that low-strain jobs represent the greatest proportion of person-months. The distribution of person-months between passive jobs, active jobs, and high-strain jobs is quite even. There are two deviations from this. Among women with one child, the smallest proportion of person-months is

found among low-strain jobs, while a marked small proportion of person-months among men with two children is found among high-strain jobs. Focusing instead on the dependent variables – the timing of the first, second, and third child – it is obvious that it is much less common to have the third child than to have the first and second. More female respondents than male respondents have their first child, while the opposite is true for the second child.

I will now instead focus on the demographic variables age and civil status, which are included as control variables. As can be expected, childless respondents (i.e. first left-hand column) are more likely to be under 30 years of age compared to respondents with one or two children. This is the case for women as well as men. Comparing those with one and those with two children, it is also obvious that a larger proportion of respondents with two children are 30 years or older. At the time of the interview in 1991, a greater proportion of childless women are either married or cohabiting compared with childless men. Among respondents with one or two children the differences between men and women regarding civil status are small. For those who have one child at the time of the interview, being married or cohabiting is somewhat more common among men. Regarding parents of two children, it is more common among women to be either married or cohabiting in 1991. Again, the difference between men and women is very small.

Let us now take a look at the two last variables which are also included as controls: tenure and education. Tenure is measured at the time of the interview in 1991, and is included in the analysis as a dummy variable. The breaking point has been set to eight months, which is identical to the qualifying period for parental insurance. Tenure of eight months or more is more common than short tenure. This is the case among both men and women, and among childless and those with children. Long tenure is slightly more common among men. Among women, a smaller proportion of those with one child have a long tenure compared with childless and two-children-parents. Educational level is included in the analyses as a dummy variable, where respondents with a university degree or at least one year of education above upper secondary/high school diploma or 3-4 year high school course are coded as 1. From *Table 1*, it is quite clear that childless female respondents have a higher level of education compared with respondents with one or two children at the time of the interview in 1991.<sup>12</sup> Further, it is substantially more common among childless women to have a high education compared with childless men. The difference is over ten per cent. On the contrary, among parents of one or two children it is more common for men to have higher education than it is for women. The differences are however smaller than among childless men and women.

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<sup>12</sup> This result probably deserves more attention, since it contradicts previous research based on Swedish data (SOU 2000:37).

TABLE 2. Cox-regressions of the timing of the first, second and third child and psycho-social work life conditions. Level of Living Survey 1991 and 2000. Person-months first child 5,200 (women), 8,141 (men), person-months second child 4,548 (women), 2,657 (men), person-months third child 9,272 (women), 8,310 (men). Hazard ratios

Variables	First Child				Second Child				Third Child			
	Model I		Model II		Model I		Model II		Model I		Model II	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
<i>Work Life Conditions</i>												
High-strain	<b>0.35**</b>	0.65	<b>0.38**</b>	0.46	0.91	0.73	1.05	0.72	0.87	0.86	1.05	0.73
Active	0.77	1.26	0.62	1.04	0.90	1.10	1.05	0.86	1.02	0.62	1.20	0.56
Passive	0.57	<b>0.42*</b>	0.56	0.71	1.10	0.56	1.07	0.58	0.84	0.53	0.94	0.52
Low-strain	1	1	1	1	1	1	1	1	1	1	1	1
<i>Age</i>												
18-29			1	1			1	1			1	1
30-45			<b>0.31***</b>	<b>0.52**</b>			<b>0.26***</b>	<b>0.49**</b>			<b>0.15***</b>	0.52
<i>Married/Cohabiting</i>												
No			1	1			1	1			1	1
Yes			<b>3.50***</b>	<b>4.37***</b>			<b>3.43*</b>	2.43			1.52	0.98
<i>Tenure</i>												
0-7 months			1	1			1	1			1	1
8 – months			1.23	<b>3.26**</b>			1.11	0.90			2.17	1.54
<i>Educational Level</i>												
< University degree			1	1	1		1	1			1	1
University degree			1.24	<b>2.34***</b>			1.11	1.55			1.11	0.99
LR chi2	6.6	5.95	36.71	45.13	0.24	2.13	19.17	8.50	0.17	1.75	13.01	3.75
Prob > chi2	0.09	0.11	0.00	0.00	0.97	0.55	0.01	0.29	0.98	0.63	0.07	0.81
Log likelihood	-235.45	-222.32	-220.40	-202.73	-157.82	-153.72	-148.35	-150.53	-133.54	-139.09	-127.12	-138.09

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$

*Table 2* shows the results of Cox regressions of first, second and third births performed separately for men and women. *Model 1* shows the results of analyses of psycho-social work conditions and the propensity to have the first child without controlling for any other relevant factors. Low-strain jobs are chosen as reference category because of their position as “psycho-social paradise”. The results indicate that women in high strain jobs have a lower propensity to have the first child compared with women in low-strain jobs. For men, a different pattern emerges. Men in passive jobs have a lower propensity of having the first child compared with men in low-strain jobs (significant on the 10 percent level). No significant associations are found for the second and third child. However, it is possible that these associations will alter when various relevant factors are controlled for. Therefore, *Model 2* of *Table 2* show the results of an analysis where *Model 1* has been expanded with demographic variables (age and whether the respondent is married or cohabiting at the time of the interview), and variables relating to work life (tenure in the job held at the time of the interview in 1991, and educational level).

The results of *Model 2* indicate that for men, the association between the propensity to have the first child and having a passive job cease to be significant when other factors are controlled for. Men who are 30 or older have a lower probability of becoming fathers, while men who are either married or cohabiting have almost five times as high probability of having the first child compared with men who are neither married or cohabiting. For women, a different pattern again appears. Even when controlling for various relevant factors, the association between having a high stress job and a lower probability for becoming pregnant with the first child remains. As for men, age and being either married or cohabiting is significantly associated with the probability of having the first child. Women who are 30 or older have a lower probability of having the first child. Married or cohabiting women are more than three times as likely as single women to become mothers. It should be stressed that the information on age and civil status refers to the time of the interview in 1991, which means that it is possible for the respondents both to separate from their partner and to find a new partner during the observation period. As was the case for the first child, psycho-social work conditions do not appear to have any associations with the timing of the second or third child. Thus, three hypotheses receive support: H1a (a high level of negative stress will be negatively related to the likelihood of having children), H2a (psycho-social work life conditions will affect men less than women), and H3 (the association between psycho-social work-life conditions and childbearing will be stronger for the first child).

I will now proceed with an analysis where psycho-social work conditions are replaced by trade (*Table 3*). Here, I have restricted the analysis to the timing of the first child, since the analyses in *Table 2* showed no associations between psycho-social work conditions and the timing of the second and third child. As was mentioned above, analyses of level of living data for 1991 and 2000 have indicated a significant increase in psychological job demands and a decrease in decision latitude for care, education, and commerce (le Grand et al. 2001). Considering this, it appears interesting not only to study psycho-social work conditions as such, but also to extend the analysis to include trade. Further, it should also be emphasized that le Grand et al. (2001) and this study use the same data material, which makes comparisons easy. However, the subsamples of LLS used in this study differ from the subsample used by le Grand et al. The main difference is that the three different subsamples used in this study are relatively small compared to the one used by le Grand et al., which naturally has consequences for the possibility to divide the samples into smaller categories. Thus, I have collapsed certain trades, while keeping commerce, and care and education as separate trades. This result in the following five categories: (1) manufacturing

industry, other manufacturing, building industry, and transportation, (2) commerce, (3) care and education, (4) public service, (5) primary industry, banking and insurance, and other service. The ambition with the categorization is to obtain categories with at least 30 respondents in each category, and still have a clear logic: it may for example not be wise to collapse primary industry and commerce because of the divergence in job contents. There are two exceptions from this principle. Public service has been kept as a separate trade despite the fact that relatively few individuals are placed in this category. The reason for this is that in a more detailed analysis (not shown in table) public service was significantly related to the timing of the first child among men. The last category consists of trades with very few respondents, and not a clear orientation towards industry or transportation. le Grand et al. (2001) use the following ten categories: (1) primary industry, (2) manufacturing industry, (3) other manufacturing, (4) building industry, (5) commerce, (6) transportation, (7) banking and insurance, (8) public service, (9) care and education, (10) other service.<sup>13</sup> Other than the restriction to the first child, and the replacement of trade for psycho-social work conditions, the models are identical to *Table 2*.

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<sup>13</sup> More precisely, le Grand et al. (2001) categorize the SNI-codes (“Svensk Näringsgrensindelning”, Swedish standard industrial classification of all economic activities, see Statistics Sweden 1977) the following way, which has also been the basic coding in this study: primary industry SNI=1, manufacturing industry SNI=38, other manufacturing SNI=2, 3 except 38, 4, building industry SNI=5, commerce SNI=6, transportation SNI=7, banking and insurance SNI=8, public service SNI=91, care and education SNI=93, other service SNI=9 except 91 and 93 (personal communication Michael Tåhlin).



TABLE 3. Cox-regressions of the timing of the first child and trade. Level of Living Survey 1991 and 2000. Person-months 5,211 (women), 8,190 (men). Hazard ratios

Variables	First Child			
	Model I		Model II	
	Women	Men	Women	Men
<i>Trade</i>				
Manufacturing + other	1	1	1	1
Commerce	1.95	1.67	<b>2.34*</b>	1.65
Care + education	0.75	0.94	1.01	0.87
Public service	1.26	<b>2.97**</b>	1.60	<b>4.30**</b>
Other	1.25	1.70	1.31	1.67
<i>Age</i>				
18-29			1	1
30-45			<b>0.32***</b>	<b>0.56*</b>
<i>Married/Cohabiting</i>				
No			1	1
Yes			<b>3.44***</b>	<b>5.15***</b>
<i>Tenure</i>				
0-7 months			1	1
8 – months			1.36	<b>3.32**</b>
<i>Educational Level</i>				
< University degree			1	1
University degree			1.24	<b>2.38**</b>
LR chi2	6.08	5.75	35.39	51.48
Prob > chi2	0.19	0.22	0.00	0.00
Log likelihood	-240.56	-233.50	-225.90	-210.64

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$

The results of the analyses depicted in *Model 1* of *Table 3* indicate that for women, there is no association between trade and the timing of the first child, at least not when no other factors are controlled for. For men, on the other hand, there is a significant association between the timing of the first child and working in public service. Men working in public service, which includes occupations such as police officer and firemen are more than four times as likely to have their first child as men working in manufacturing of some sort or transportation. This result should however be interpreted with caution. As was the case in *Table 2*, I will now expand the analysis to comprise also demographic variables and work-life variables. The expanded analysis, *Model 2* of *Table 3*, indicate that women working in commerce are more than twice as likely as women working in manufacturing of some sort or transportation, to have their first child. This result is significant at the 10 percent level, which indicates that it should be interpreted with caution. In addition, younger women are more likely to become first-time mothers, as are women who are either married or cohabiting at the time of the interview in 1991. For men, working in public service has a positive association with the timing of the first child also when other relevant factors are controlled for. The hazard ratio even increases (from 2.96 to 4.30) in the expanded model compared with the basic model. Being either married or cohabiting 1991, having a university degree or at least one year of education above upper secondary/high school diploma or

3-4 year high school course, and a tenure of 8 months or more are all positively associated to the timing of the first birth at the 5 percent level. In addition, younger men are more likely to have their first child compared with older men, a result that is significant at the 10 percent level.

The results presented in *Table 3* have no obvious interpretation, at least not in relation to the results regarding childbearing and psycho-social work conditions presented in *Table 2*. For women, we would expect a negative association between childbearing and working in trades categorized as having a large proportion of high-strain jobs such as commerce. We would also expect a negative relationship between working in education and care, and the timing of the first child. On the contrary, we find a positive relationship between working in commerce and having the first child, and no association with education and care. Thus, to a certain degree, when psycho-social work conditions are replaced by trade, the hypothesis that trade is positively associated with the likelihood of having a child (H4b) receives support. However, it might well be the case that not *all* jobs in commerce are high-strain jobs, and that this blurs the results. One way to investigate this further is to categorize the respondents in these trades according to their psycho-social work conditions as defined in *Table 1* and *2*, and re-run the analysis in *Table 3* with these variables included. Unfortunately, the samples used in this study are too small for an analysis of this kind to make any sense. However, what can be done is simply to examine cross tabulations of trade and psycho-social work life conditions. Moreover, this simple operation can also be directly compared with descriptive statistics presented in le Grand et al. (2001).

TABLE 4. *Descriptive statistics of psycho-social work life conditions cross-tabulated with trade, by gender. Level of Living Survey 1991 and 2000. 161 women, 216 men. Percent*

		Women	Men	le Grand et al. 2001 (Men + Women)
<i>Manufacturing</i>	High strain	17	11	n.a.
	Active	23	19	n.a.
	Passive	31	24	n.a.
	Low-strain	29	46	n.a.
	<i>Total</i>	<i>100</i>	<i>100</i>	–
<i>Commerce</i>	High strain	0	19	21
	Active	10	28	n.a.
	Passive	35	10	n.a.
	Low-strain	55	43	n.a.
	<i>Total</i>	<i>100</i>	<i>100</i>	–
<i>Care + education</i>	High strain	24	19	35
	Active	27	22	n.a.
	Passive	10	17	n.a.
	Low-strain	39	42	n.a.
	<i>Total</i>	<i>100</i>	<i>100</i>	–
<i>Public service</i>	High strain	23	0	18.
	Active	33	33	n.a.
	Passive	22	11	n.a.
	Low-strain	22	56	n.a.
	<i>Total</i>	<i>100</i>	<i>100</i>	–
<i>Other</i>	High strain	17	0	n.a.
	Active	21	36	n.a.
	Passive	24	12	n.a.
	Low-strain	38	52	n.a.
	<i>Total</i>	<i>100</i>	<i>100</i>	–

The descriptive statistics in *Table 4* shows both cross tabulations for the samples used in this study, and excerpts from le Grand et al. (2001, right-hand column *Table 5*, p 104). Lets focus on the three trades that have not been collapsed in this study; commerce, education/care, and public service. As regards commerce, the descriptive statistics for the present study indicate that the high-strain jobs are predominantly male. In fact, women are not represented in high-strain commerce jobs at all. There are only slight differences between the present study and le Grand et al. (2001). Examining the results for education/care, a smaller proportion of men have high-strain jobs compared with women. Compared with le Grand et al. (2001), a smaller proportion in the present study has high strain jobs within education/care. This is the case for women as well as for men. Finally, in the present study, the high-strain jobs in public service are entirely occupied by women. Again, a smaller proportion of men and women in the present study have high strain jobs within public service.

In summary, four hypotheses receive support. First, women working in high-strain jobs are less likely to have their first child compared with women working in low-strain jobs, while no impact of psycho-social work life conditions are found for men (H1a and H2a). Further, an association

between psycho-social work life conditions and the timing of children is found for the first-born child, but not for the second and the third (H3). Finally, the hypothesis that working in a trade characterized by a high level of negative stress is positively related to the likelihood of having children (H4b) receives support for women. This last finding is obviously contradictory to the support of H1a.

## 5. DISCUSSION

The aim of this study has been to explore the associations between psycho-social work-life conditions and the likelihood of childbearing. The main result is that having a high-strain job is associated with a lower probability for the first child among women, while no significant associations between work-life conditions and childbearing are found among men, at least not when relevant controls are made. These results are interesting, not least in relation to previous research. In fact, the result that women in high-strain jobs have a lower probability of having their first child is almost identical to the results of a Danish study (Hjollund et al. 1998), despite the fact that Hjollund et al. differ greatly in research strategy compared to this study. Some important differences will be pointed out here. Hjollund et al. (1998) follow 297 Danish couples without previous reproductive experience. The sample was recruited from personal mailing to 52 255 trade unions members aged 20-35, living with a partner and childless. The data used in this study has different age dispersion (18-45), and has a different sample population. The response rate in the Danish study is low, approximately 10-20 percent (Hjollund et al. 1998, p 344), while it is relatively high in the present study (77 percent). Another characteristic of the Danish sample is that it is restricted to certain occupational groups: metal workers, nurses, office workers, and day-care workers, while the data used in this study cover all socio-economic groups. The couples in the Danish study are enrolled in the study at the time of discontinued birth control and are followed up to 6 menstrual cycles or the event of pregnancy. The criteria of enrollment indicate that the couples included in the study are likely to plan to have children within a near future, which implies a great difference compared with the data used in this study. The fact that the results from two different studies with independent samples and research strategies are very similar strengthens the conclusion that psycho-social work life conditions actually are related to the likelihood of first births among women.

Two other studies are of particular importance when discussing the results of the present study. The first is the study by le Grand et al. (2001), which examined the development of psycho-social work conditions in the Swedish labor force during the 1990s. According to the results of this study, negative stress in work life increased significantly in care, education, and commerce. In other words, trades dominated by female employees. The results of this study showed no significant associations for women between working in care or education and having the first child, while women working in commerce were more likely to have their first child compared with women working in manufacturing. For men, the results indicated that those working in public service are more likely to enter fatherhood compared with men working in manufacturing. Naturally, it may be questioned whether this pattern is an effect of the fact that small samples are not easily divided into subgroups, rather than an indication that childless men and women have different psycho-social work conditions compared with the working population as a whole. It is obvious that this question cannot be answered with the data material used in the present study, but should be a question of concern for future research. The second study is by Hoem (SOU

2000:37), in which childbearing and educational alignment is studied. In Hoem's study, it was found that women educated for care and education were more prone to have their first child compared with other women. To be noted in this context is not only that different educational choices lead to different jobs with different levels of job-related strain, but also that different educational choices presumably are associated with preferences, such as a family orientation.

Another interesting result from this study is that an association between psycho-social work life conditions and the likelihood of having children only was found for the first child, and not the second and third. In part, this might be related to the greater social significance of the first child compared with latter children. But it can also be discussed whether there is a (causal) relationship between psycho-social work conditions, the first birth, job changes, and the births of subsequent children. Do psycho-social work conditions differ between childless, one-children-parents, and parents with more than one child? With the research strategy used in the present paper, this question cannot be answered, but it is an important question for further studies on this subject. An important related question is naturally to what extent employers can provide a working-life climate that does not discourage individuals to have children. Numerous studies (e.g. Andersson 2000; Hoem 2000) including the present study, has shown that work-life and childbearing are intimately related. Naturally, low fertility implies that a growing proportion of the population needs to be provided for by a constantly decreasing group. Given the significance of work life for childbearing, the significance in a future perspective should also be apparent. Finally, it still remains to be explained *how* psycho-social work life conditions affect the likelihood of having the first child among women.

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