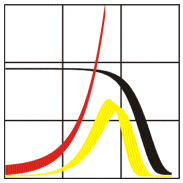

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Do Child Care Characteristics Influence Continued Childbearing in Sweden? An Investigation of the Quantity, Quality, and Price Dimension

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Do Child Care Characteristics Influence Continued Childbearing in Sweden? An Investigation of the Quantity, Quality, and Price Dimension

by

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Abstract: We link population register data to information on regional child care characteristics in order to estimate the influence of the latter on second and third birth intensities of Swedish couples in 1997-98. Our analysis allows us to distinguish interactions and specific effects of different dimensions of the local day-care infrastructure, namely the provision rate, the child-to-staff-ratio, and the costs of care to parents. However, our results reveal no clear effects of these child care characteristics on Swedish couples' continued childbearing. We interpret this absence of effects as a reflection of the generally very appropriate level of child care in Sweden, which is complemented by further supportive family policies. In such a context, moderate regional variations in the characteristics of day care may have no decisive impact on parents' propensity to have another child.

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1. Introduction

The 1990s produced a large body of research focusing on the role of social policies in recent Swedish fertility developments (e.g., Hoem and Hoem 1996, 1999; Hoem 1990; Sundstöm and Stafford 1992). The story that these studies tell is one of a fairly successful attempt to create a social and institutional environment that is directed towards gender equality and allows a high female labour force participation and a comparatively high level of fertility at the same time. Main pillars, on which the compatibility of women's employment and motherhood rests, are the generous parental leave regulations (cf. Sundström and Duvander 2002) and the extensive provision of highly subsidised high-quality public child care. In this paper, we investigate whether variations in day-care characteristics between Swedish municipalities have an effect on continued childbearing.

Most recently, various cut-backs in the degree of income replacement for parents on leave (from up to 90 percent of the income earned prior to childbearing to 80 percent of that income – and for a brief period to just 75 percent) and simultaneous reductions in the levels of child allowance have been made responsible for some of the fertility decline that occurred in Sweden during the 1990s (e.g., Hoem and Hoem 1996, 1999; Andersson 1999). These changes in family policies affected the whole population of parents, independent of their place of residence. Other societal factors influencing demographic behaviour are likely to have a more pronounced spatial component, though, and an increasing number of studies in family research accounts for the interrelation between individuals and their regional social, economic, and cultural context (e.g., Hank 2002; Teachman and Crowder 2002). Hoem (2000), for example,

showed that during the 1980s and 1990s first-birth rates in Sweden rose and fell in step with municipal employment levels.

The Swedish day-care system is widely considered as exemplary in terms of availability, quality, and price (e.g., Broberg and Hwang 1990; Gustafsson and Stafford 1994; Kamerman 1991). However, although public responsibility for child care remained strong throughout the 1990s, "decision-making power has been increasingly transferred from the state to the municipalities. This has led to a situation where child care, which once operated according to the same rules across the country, can vary substantially across municipalities" (Bergqvist and Nyberg 2002: 300). Thus, the question of regional differentials in supply, staff, and prices has gained some importance when one asks for the possible effect of child care on female labour supply and/or fertility decisions. Already a decade ago, Gustafsson and Stafford (1991) found that the availability of public child care in a municipality increased the labour market activity of Swedish women with preschoolers. In addition, when spaces were not rationed, a lower price encouraged the use of out-of-home child care.

In the present investigation, we link data from Swedish population registers with information on regional child care characteristics to estimate the influence of the latter on second and third birth intensities of married or cohabiting couples in 1997 and 1998. These are two years when Swedish period Total Fertility Rates reached an all-time trough. In contrast to the childless, parents already have first-hand experience with the local child care situation. Therefore, particularly fertility decisions at higher parities might be affected by a municipality's day-care infrastructure. Our analysis allows us to distinguish specific effects of its different dimensions, namely the provision rate, the

child-to-staff-ratio, and the costs of care to parents. To begin with, the following section gives a brief review of previous studies and their implications for further research.

2. Previous research on child care and fertility

Many studies show that affordable prices and a sufficient availability of day-care centres facilitate greater participation of mothers in the labour market (e.g., Anderson and Levine 2000; Gustafsson and Stafford 1991; Stolzenberg and Waite 1984). However, although the role of child care in fertility decisions is frequently acknowledged (e.g., Brewster and Rindfuss 2000; Rindfuss and Brewster 1996), the demographic literature investigating this issue empirically at the micro-level is relatively small.

A study by Lehrer and Kawasaki (1985) suggests that the availability of care by relatives increases US parents' desire to have another child. Mason and Kuhltau (1992) found evidence for child care constraints on women's employment and fertility in a sample of Detroit-area mothers. For Norway, Kravdal (1996) reports a stimulating effect of an increasing supply of public day care for children aged 0 to 3 on women's probability to advance to parity three. However, this effect only appears at very low levels of day-care coverage. There is no increase in birth probabilities at coverage levels above 10 percent, and the day-care-effect becomes insignificant when aggregate female employment is accounted for in the model. More recently, Del Boca (2002) detected a positive influence of the availability of public child care on childbearing in the Italian lowest-low fertility setting. Hank and Kreyenfeld (2003), on the other hand, do not find such an effect in their analysis of western Germany (see also Kreyenfeld and Hank 2000). They argue that the institutional set-up of the western German day-care regime is

inappropriate to foster fertility and the employment of mothers. Access to informal care arrangements (namely the grandparents), however, increases a woman's probability of entering motherhood.

Hank and Kreyenfeld (2003) point out that empirical studies usually face severe limitations with regard to their measurement of child care. In most cases, only a single indicator is used to account for a truly 'multidimensional' commodity. To improve our understanding of the relationship between children's day care and women's fertility decisions, at least three basic dimensions of child care should be considered and analysed jointly, namely: costs, quality, and availability.[1]

- At least in the American context, the *cost dimension* has often been the main concern in discussions of the child care issue (e.g., Blau and Robins 1989; Mason and Kuhltau 1992). In a situation characterised by a functioning private market for children's day care (e.g., Blau 2001: Chapter 2), the price may indeed be the decisive determinant of whether to use or not to use a specific care arrangement.

- The *quality dimension* of care has lately received increasing attention (e.g., Blau 2001: Chapter 7; Blau and Hagy 1998). Parents will only make use of out-of-home child care, if they are convinced that it does not harm their offspring. However, evaluating the quality of care provided in an institution is not easy. Empirical studies frequently use structural indicators such as the child-group size, the child-to-staff ratio, or the level of provider training to assess the quality of child care. This need

[1] Further issues – that should ideally be addressed, but are even more difficult to tackle empirically – are related to the dynamics and heterogeneity of parents' child care needs (e.g., Glass and Estes 1997) and to the fact that children are frequently subject to multiple care arrangements (e.g., Smith 2000).

not necessarily match with those child care characteristics valued most by parents (e.g., familiarity, reliability, or convenience), though.

- Particularly in the European context, with its lack of commercial day-care providers and a predominance of publicly provided slots, the *availability dimension* is an important matter (e.g., Kravdal 1996; Kreyenfeld and Hank 2000). In the first place, availability refers to the number of slots for children of a given age range, but it also comprises questions such as the convenience of the geographical location or the flexibility of opening hours (Gordon and Chase-Lansdale 2001).

A specific 'day-care regime' (Gustafsson and Stafford 1994) may be described best with reference to the three above-mentioned categories, i.e. by the type of child care subsidies, by the coverage level reached through public intervention, and by the degree of quality regulation. The next section provides a short overview of the Swedish setting in the 1990s and the peculiarities of its child care system.

3. Trends in fertility and child care: Sweden during the 1990s

While fertility rates increased throughout the 1980s, Sweden experienced a sharp decline in fertility during the 1990s. The period Total Fertility Rate (TFR) slightly passed above the replacement level of 2.1 in 1990, just to drop to an unprecedented low level of 1.5 in the years 1997–1999. However, birth risks of different subgroups of women declined to a different extent. Andersson (1999) shows that first-birth intensities of childless women in their 20s declined by almost 40 percent, as did the risk of two-child mothers to give birth to a third child. Second-birth risks, on the other hand, declined more moderately, by about 20 percent, between 1990 and 1996. Childless

women in their 30s barely contributed to the general fertility decline at all. In addition, Hoem (2000) and Andersson (2000) demonstrate that women with a lower level of earned income and those enrolled in education had lower birth risks. Changes in the number of these women eventually resulted in the pro-cyclical Swedish fertility pattern of the 1980s and 1990s. The effect of labour-market variables was strongest on first-birth risks, while second- and third-birth rates remained relatively unaffected by variations in women's earnings and activity status. (See Figure 1 for an overview of childbearing risks among Swedish mothers – who are the study population of our present investigation – from the 1960s onwards.)

[Figure 1 about here]

In Sweden, public day care for children is regarded as an important part of the overall welfare system, which is directed towards a dual-breadwinner model, gender equality, and the promotion of same opportunities for children of all social backgrounds (cf. Bergqvist and Nyberg 2002; Gunnarsson et al. 1999). The provision of public child care improved substantially during the 1970s to 1990s, when the expansion of child care services became a generally accepted policy objective, partly being linked to economic growth and a demand for women in the labour force.

While in 1975 less than 20 percent of children under the age of 7 were enrolled in a public day care institution, this number had increased constantly to almost 75 percent in 1997 (see Figure 2). Many of the children not enrolled have younger siblings and stay at home with one of their parents during the parental leave period, which often lasts for more than a year. In the 1970s and 1980s, the costs of institutional child care were predominantly covered by state and municipal subsidies (each covering about 45

percent), while parents' fees accounted for only 10 percent of the gross costs. However, as a consequence of the economic crisis during the 1990s, budgets for child care were trimmed. State and municipalities tried to reduce their expenditures and parents' contribution to the costs of care increased to 17 percent in 1998. Moreover, the number of children per child-care worker rose substantially throughout the 1990s. The potential impact of a deteriorating quality of care on parents' willingness to have more children was a frequently raised concern in the popular debate on the fertility decline of the 1990s. (See Bergqvist and Nyberg [2002] for a thorough review of the developments described in this paragraph. For further information on changes in family policies, see Ministry of Health and Social Affairs [2001].) *In sum*, the general trend in developments of child-care characteristics during the 1990s can be described as that of a further increase in quantity, a somewhat reduced quality, and increasing prices.

[Figure 2 about here]

Another noticeable development of the 1990s was the growing regional diversity with regard to the child care infrastructure. As part of a general process of decentralization, the municipalities gained higher autonomy and more responsibility in these issues from the Swedish central government (e.g., Gunnarsson et al. 1999: 30ff.). This is manifested in the following statistics on child-care characteristics as experienced by Swedish parents in our data set. In 1996 and 1997, the median price paid by parents for a year of full-time day care for a child aged 1-12 years[2] was slightly above 12,500

[2] Available statistics on local day care in Sweden relate to children aged 1-12 years. For our purposes, this is a less desirable feature since the characteristics of day care for children at different age groups might have different impacts on the childbearing decisions of parents.

Swedish Kronor (SEK).[3] About a fifth of parents lived in a municipality where they had to pay less than 11,400 SEK, while another fifth lived in places with prices of 14,000 SEK or more. On average, the number of full time children per full time staff was just above four (4.1 in 1996 and 4.2 in 1997). One fifth of parents lived in municipalities where the child-to-staff ratio was less than 3.8, while the 'worse-off' quintile of parents faced a day-care situation with at least 4.6 children per staff. Finally, the median level of day-care provision for children aged 1-12 was 57.5 percent. Roughly one fifth of parents lived in a municipality where fewer than 52.5 percent of children in this age group were enrolled in child care, while another fifth had their residence in municipalities with a coverage level of 65 percent or more.

4. Data and methods

Our investigation is based on data on the childbearing behaviour of Swedish parents in 1997 and 1998. From Swedish population registers, we have access to the demographic histories of the entire population of co-residing parents in Sweden during the 1980s and the 1990s. Our data cover the demographic and educational characteristics of women and men who are registered as living together, be they married or not, if they have at least one common child together. We have used this information to estimate models of second- and third-birth risks for intact families of Swedish-born partners. The parity here refers to that of the woman, but also to the number of common children of any couple considered. Observations are censored at emigration, death, or separation of parents. Censoring also occurs at the end of 1998, and when a youngest child turns ten, whichever event comes first. In a subsequent step, we link our individual-level data on

[3] A Swedish Krona is worth approximately one tenth of a Euro.

demographic behaviour with aggregate statistics referring to the municipality of residence of each family, namely, with information on the child care infrastructure in any of the 288 Swedish municipalities.

We apply event-history analysis to our data and estimate models of second- and third-birth risks by age of the youngest child, age of the mother, mother's and father's educational level, type of municipality of residence, and the various child care characteristics that hold for that municipality. Our data cover around 500,000 couple years of observation resulting in 42,000 second births and 11,000 third births in 1997 and 1998. See Table 1 for further descriptive statistics.

[Table 1 about here]

We use statistics on child care as produced by the Swedish Association of Local Authorities. Their data do not allow for comparability over extended periods of time since definitions of statistics have been under constant change. The statistics that are available for 1996 and 1997 all refer to children at ages 1-12 years in full-time child care. These statistics thus covers both pre-school child care and after-school child care offered to children in primary school. From these statistics, we have defined three categorical variables in order to describe the quantity, quality, and price of the local child care. They are all defined in a way that the approximate quintile of parents who live in a municipality with the worst conditions will constitute one category, while the quintile of parents with the best conditions form another one, and the remaining three fifths of parents constitute the reference category. By this manner, we can investigate whether a particularly good or a relatively poor child care infrastructure is related to a higher or lower propensity to have another child. We use the characteristics observed in

1996 and 1997 as determinants of the childbearing behaviour in 1997 and 1998, respectively.

Since the type of municipality might have an effect on childbearing behaviour that is independent of its child care characteristics, we include a variable to pick up and control for such effects as well. After some experimentation, we found it feasible to let the three biggest cities of Sweden constitute one category of that variable, a group of 59 small (in terms of population size) country-side municipalities[4] another one, while the remaining municipalities are used as the reference category.

5. Regression results

As the results for the demographic control variables (age of woman and her youngest child) are very standard, they will not be dealt with here. Next, our finding of a positive effect of the educational level of both men and women on birth risks of parents (*Model 1* of Tables 2-3) is consistent with recent literature that postulates a changing relationship between women's educational attainment and fertility (e.g., DeWit and Ravanera 1998; Kravdal 1992). However, we would like to point to the very similar magnitude of the positive effect of men's and women's education on the transition to the second child, and the much stronger positive impact of the female partner's tertiary education on the risk of having a third birth. Our findings are also complemented by results on the effect of income and labour market attachment on continued childbearing of Swedish parents (cf. Andersson and Duvander 2003).

[4] These are municipalities belonging to the categories "landsbygds- och glesbygdskommuner" as defined by the Swedish Association of Local Authorities.

In *Model 2*, we added information on the type of municipality. In this respect, we find the lowest second birth risks in the metropolitan areas of Stockholm, Gothenburg, and Malmö, and the highest propensity to have a third child in the plain countryside municipalities (see Courgeau [1989] for a general discussion). One main reason for the reduced second birth intensities in the biggest cities should be the type of housing by which they are characterised and which typically is unsuitable for families with more than one child. Thus parents are likely to move to suburban or other municipalities in anticipation of higher parity births.

Turning to the role of child care characteristics (*Model 3*), there is no indication of an effect of the quantitative provision of care on the transition to the second child (Table 2). The impact of child care quality and its price is also very small (2-3 percentage points) – and goes into an unexpected direction. Women living in a municipality with higher costs of care and a poorer child-to-staff ratio are slightly more likely to experience a second birth than their counterparts in the reference category ('medium' price and quality). Similarly counterintuitive results are found when the progression to the third child is considered (Table 3). The risk of giving birth to another child is 7 percentage points higher, where the day-care coverage is low. The 'quality' effect is merely half that size, but still goes in the same unexpected direction. Only the correlation between the costs of care and the third birth is basically as expected. Mothers of two children have an 11 percentage points higher probability to experience another birth when they live in a place that provides day-care opportunities at relatively low costs.

[Table 2 about here]

[Table 3 about here]

Each of the above results for one specific dimension of the local child care infrastructure holds independently of the inclusion or exclusion of the other two, and regardless of whether we control for the type of municipality. Finally, none of the possible interactions between these variables (which we estimated, but do not display here) turned out to provide any further insights.

6. Conclusions

While Sweden's child care system often is considered to be an important underlying factor of the country's relatively high fertility rates in the late twentieth century (e.g., Brewster and Rindfuss 2000; Hoem and Hoem 1996), we barely find any impact of regional variations in child care characteristics on Swedish couples' continued childbearing – during a brief calendar period of reduced fertility levels. Moreover, where there is any effect at all, it is mostly not the one that we would have expected: higher costs and lower quality increase second birth risks, and a poorer quantitative provision of child care is related to higher transition rates to a third child.

To some extent, the latter, seemingly counterintuitive results, might be a reflection of the fact that our childbearing intensities tend to catch both tempo *and* quantum effects in the propensity to give birth. These cannot be separated readily, and in some situations, effects like the ones we just observed might make sense. In other words: Women facing a poor child care infrastructure in their municipality of residence may speed up their childbearing, e.g., to minimise inconvenient interruptions from the paid labour force, without necessarily having a higher completed fertility than women in areas with more favourable day-care characteristics. It should be noted, though, that we

do not find a real interaction between the length of birth intervals and the local child care variables, which would have given firmer support to such an interpretation.

Concerning our more general finding that variations in day care between Swedish municipalities barely contribute to a better explanation of patterns in continued childbearing, mainly two arguments can be made. *First*, despite some regional variation in the quantity, quality, and price of day care, the overall coverage with affordable, high-quality child care opportunities is apparently on a sufficiently high level as to allow parents to make their fertility decisions relatively independent of the specific characteristics of their local area. *Secondly*, child care is a crucial, but not the only institutional condition necessary to ensure the compatibility of work and family. With reference to the western German case, for example, Hank and Kreyenfeld (2003) have argued that even a better provision with day care would not suffice to foster women's employment and fertility, as long as most other welfare state institutions remain directed toward the traditional male breadwinner model. For Sweden, this argument can be turned upside down. The general welfare state set-up with its supportive family policies (including a number of financial support schemes and generous parental leave regulations, for example) easily cushions minor deficits in a municipality's child care infrastructure. Thus, instead of maintaining a perspective that usually focuses on single family policies only without taking into account their institutional context, politicians as well as researchers should ideally try to consider more of a country's system of family policies as a whole, including its manifold interactions with other societal institutions.

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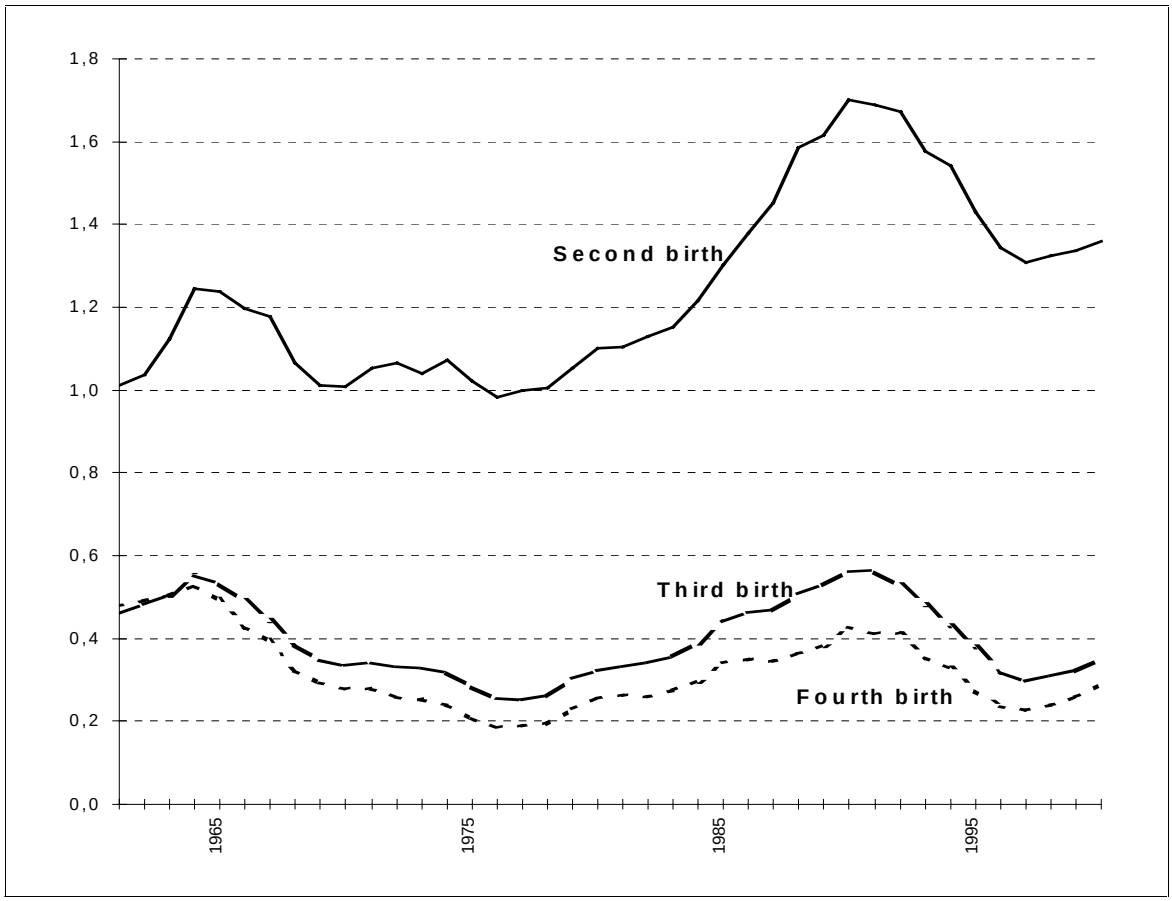
Figures & Tables

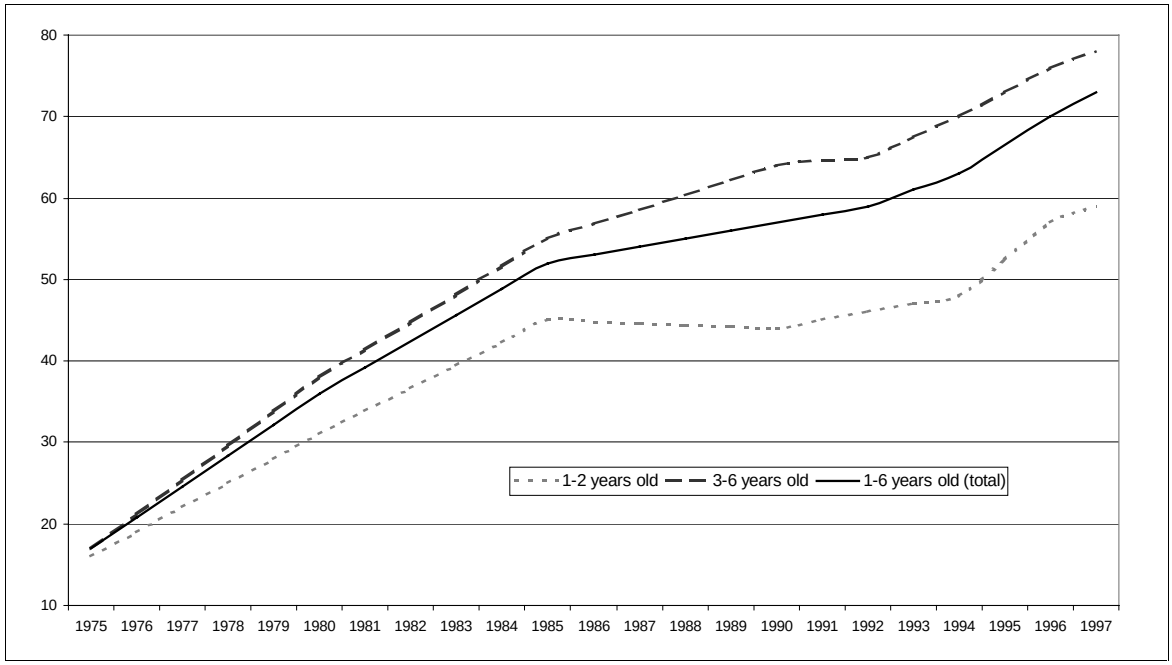
Figure 1: Mothers' relative risks of continued childbearing in Sweden, 1961 to 2000[a]



[a] Standardised for woman's age and age of her youngest child. Risks relative to second-birth risks (of one-child mothers) in 1977.

Source: Andersson and Liu 2001, p. A7.

Figure 2: Enrolment of children in publicly subsidised day-care centres, pre-schools, and family day-care units, 1975 to 1997 (percent of population, by age group)[a]



[a] Since information on the provision of child care was not available for every single year, information for missing years was interpolated.

Source: Bergqvist and Nyberg 2002, p. 289/293, own representation.

Table 1: Exposures to risk of a second and a third birth in 1997-1998 (percent)

	One-child couples	*Two-child couples*
Woman's educational level		
Primary	9.3	7.9
Secondary	59.9	60.7
Tertiary	30.8	31.4
Man's educational level		
Primary	14.4	15.0
Secondary	58.2	55.6
Tertiary	27.3	29.4
Type of municipality		
Stockholm-Gothenburg-Malmö	15.9	10.9
Standard	77.7	82.3
Countryside	6.4	6.8
Price of child care		
Low (<11,400 SEK/year)	16.3	16.8
Medium (11,400-13,999 SEK)	63.3	60.7
High (≥14,000 SEK/year)	20.4	22.5
Quantity of child care		
Low (<52.5% coverage)	19.7	20.3
Medium (52.5-64.9% coverage)	59.6	61.5
High (≥65.0% coverage)	20.7	18.2
Quality of child care		
Low (≥4.6 children/staff)	21.7	23.1
Medium (3.8-4.5 children/staff)	57.0	56.4
High (<3.8 children/staff)	21.2	20.5

Table 2: Relative risk of second birth of Swedish one-child parents, standardised for woman's age and age of the first child, 1997-1998

	Model 1	*Model 2*	*Model 3*
Woman's educational level			
Primary	0.84	0.84	0.83
Secondary	1	1	1
Tertiary	1.25	1.26	1.26
Man's educational level			
Primary	0.89	0.89	0.89
Secondary	1	1	1
Tertiary	1.21	1.22	1.21
Type of municipality			
Stockholm-Gothenburg-Malmö		0.89	0.90
Standard		1	1
Countryside		1.02	1.03
Price of child care			
Low (<11,400 SEK/year)			0.97
Medium (11,400-13,999 SEK)			1
High (≥14,000 SEK/year)			1.02
Quantity of child care			
Low (<52.5% coverage)			1.01
Medium (52.5-64.9% coverage)			1
High (≥65.0% coverage)			1.01
Quality of child care			
Low (≥4.6 children/staff)			1.03
Medium (3.8-4.5 children/staff)			1
High (<3.8 children/staff)			0.98
Log likelihood	-214,236	-214,198	-213,995

Table 3: Relative risk of third birth of Swedish two-child parents, standardised for woman's age and age of the second child, 1997-1998

	Model 1	*Model 2*	*Model 3*
Woman's educational level			
Primary	1.04	1.05	1.04
Secondary	1	1	1
Tertiary	1.63	1.64	1.64
Man's educational level			
Primary	0.99	0.99	0.98
Secondary	1	1	1
Tertiary	1.23	1.25	1.25
Type of municipality			
Stockholm-Gothenburg-Malmö		0.95	0.99
Standard		1	1
Countryside		1.26	1.22
Price of child care			
Low (<11,400 SEK/year)			1.11
Medium (11,400-13,999 SEK)			1
High (≥14,000 SEK/year)			1.04
Quantity of child care			
Low (<52.5% coverage)			1.07
Medium (52.5-64.9% coverage)			1
High (≥65.0% coverage)			0.97
Quality of child care			
Low (≥4.6 children/staff)			1.03
Medium (3.8-4.5 children/staff)			1
High (<3.8 children/staff)			0.99
Log likelihood	-80,755	-80,731	-80,677