Socio-economic Differentials in the Uptake of (In)formal Childcare and the Effecs of Childcare Strategies on Second Birth Hazards.

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Abstract

Background: The positive association between fertility and female employment in OECD countries suggests that family policies have played an important role in reducing the 'parent-worker' conflict. The empirical literature, however, finds only small positive effects of family policies on fertility, but has typically failed to consider eligibility and uptake of family policies at the individual level, as well as population heterogeneity in the uptake and effect of these policies.

Data and method: Using longitudinal individual-level data from the 2001 Census and the National Register, we document socio-economic and educational differentials in the uptake of formal childcare (kindergarten, daycare mothers) and informal childcare arrangements (family or household members) in Belgium in 2001 and analyze the effect on second birth hazards in the period 2002-2005 using late entry discrete-time hazard models.

Results: In line with theoretical expectations, results show that 70 per cent of the higher educated women make use of formal childcare arrangements compared to 35 per cent of the middle and only 20 percent of the lower educated women. Among middle educated women informal care is the dominant mode of childcare, whereas lower educated women have the highest probability of not using any type of formal or informal childcare arrangement. With respect to the effect of childcare on second birth hazards, the analyses show that focusing on each mode of childcare separately yields inconsistent results, whereas simultaneously considering non-uptake, unimodal uptake and combined uptake of different modes of childcare shows strong positive effects of informal and particularly formal childcare arrangements on second birth hazards, the effects being particularly articulated for higher educated women.

Keywords

(in)formal childcare – uptake – second birth hazards – late entry hazard model

1. Rationale and Theoretical Background

The positive association between fertility and female employment in OECD countries suggests that family policies focusing on childcare and parental leave schemes have played an important role in reducing the 'parent-worker' conflict. The empirical literature, however, finds only small positive effects of such family policies on fertility, but has typically failed to consider eligibility and uptake of family policies at the individual level, as well as population heterogeneity in the uptake and effect of these policies (Gauthier, 2007; Mills, Rindfuss, McDonald, Velde, & Force, 2011).

In contrast to the empirical literature, economic theories of family formation suggest that strong socio-economic differentials in the uptake of family policies such as childcare arrangements are likely to emerge (Becker, 1981). Women who have established a strong socio-economic position before the start of family formation – frequently higher educated women – are better equipped to deal with the cost of family formation (income effect), but at the same time face strong opportunity costs associated with childrearing in contexts where having a child implies a partial withdrawl from the labour market (opportunity cost). Particularly for women with a high earning potential the availability of childcare is likely to be an important factor reducing the opportunity costs of family formation, thus attenuating the negative effect of opportunity costs on fertility and allowing the income effect to come to play (Liefbroer & Corijn, 1999). Higher educated women (often in dual-earner families) are more likely to have sufficient earnings to afford formal childcare and have been found – given the strong economic incentive to combine family formation with continued labour force participation – to have more favourable attitudes towards working mothers (Neels & Theunynck, 2012). For middle educated women the opportunity cost associated with a (partial) withdrawl from the labour market due to family formation may be lower - particularly when the costs of childcare are high – but a complete or partial withdrawl from the labour market may nevertheless adversely affect household income. As a result we expect that these women are less likely to rely on formal childcare arrangements and more likely to combine continued labour force participation with uptake of informal childcare arrangements. Although childcare availability also reduces opportunity costs of family formation for middle educated women, the income effect is assumed to be less articulated among middle-educated groups than among higher educated women, resulting in lower parity progression ratios to subsequent births. For the lowest educated women and women with otherwise poor prospects in the labour market (e.g. migrant women) the opportunity cost associated with family formation is assumed to be low for women working in low-income jobs and may even be nonexistent or reversed for women relying on social security benefits. When these women are important income providers in the household we expect them to largely rely on informal childcare arrangements rather than formal childcare arrangements. Women who are not main income providers and women who did not work prior to family formation are considered more likely to provide care themselves and not rely on any formal or informal childcare arrangement as a result. The lack of prospects for lower educated women in the labour market may furthermore provide a strong impetus for parenthood and lead to accentuation of traditional norms regarding family formation given the inability of these women to use stable careers or marriages as incertainty-reducing life trajectories (Friedman, Hechter, & Kanazawa, 1994).

Although the rational choice framework and theoretical frameworks assuming non-standard values suggest strong socio-economic differentials in the uptake and effects of formal and informal childcare arrangements on family formation, the literature on the effects of childcare on family

formation has largely neglected aspects of eligibility and individual uptake, as well as population heterogeneity in the uptake and effects of family policies (Gauthier, 2007; Neyer & Andersson, 2008). Given this gap in the empirical literature, this paper analyses socio-economic differentials in the uptake of both formal and informal childcare arrangements as well as the effects of different childcare strategies on subsequent parity progression.

2. Data and Methods

2.1 Linked Census and Register data

The analysis uses data from the 2001 census linked to data from the National Register for the period 2001-2005. For women aged 14 and older on October 1st 2001, the census provides the date of the first cohabitation and first marriage as well as the year of each live birth that women had. In addition, for households with a resident child born between January 1st 1996 and September 30th 2001 the household form provides information on the number of children attending formal childcare arrangements such as i) kindergarten, ii) crèche, and iii) daymothers, as well as the number of children being minded through informal arrangements such as iv) household members and/or v) family members or acquaintances.

The data from the 2001 census have been linked to data from the national register for the period 2001-2005 allowing to identify households and women who have had a second birth within the observation period. The analysis uses data on women age 15 to 49 at the time of the census who had their first child in 1999 or 2000, meaning that these children were aged between 9 months and 2 year and 9 months at the time of the 2001 census. Although information on childcare arrangements is also available for older children born between 1 January 1996 and 31 December 1998, we consider this age range the most relevant to study the impact of (in)formal childcare arrangements on second birth hazards as mothers can combine maternity leave (3 months) and parental leave (3 months) following the birth of their child and children can enroll in kindergarten from the age of 2 ½ onwards.

2.2 Model specifications

The analysis considers both uptake of formal and informal childcare arrangements, as well as the effect of uptake of childcare for the first child on second birth hazards in the period from January 1st 2002 to December 31st 2005.

- *Uptake of (in)formal childcare arrangements*

For the analysis of socio-economic differentials in uptake of childcare at the time of the 2001 census, we use logistic regression models considering each mode of (in)formal childcare in turn as the dependent variable[1]:

$$\frac{P(uptake)}{1-P(uptake)} = a + \sum_{k=1}^{4} b_k EDU_{ki} + c\, AGEKID1_i + c_2 AGEKID1_i^2$$

[1] As enrolment in kindergarten is quasi universal in Belgium for children aged 2 ½ and older, we only focus on the uptake of formal childcare arrangements (crèche or daymother) and informal childcare arrangements (household members, family members of acquaintances) for younger children.

Where the EDU_{ki} are dummy variables referring to the highest level of education attained by women on 1 October 2001. The analysis distinguishes between women with i) no education or primary education (reference category), ii) lower secondary education, iii) higher secondary education, iv) short type tertiary education and v) long type tertiary education. As the mode of childcare may differ depending on the age of the youngest child, we control for the of the first child in years on 1 October 2001 ($AGEKID_i$, quadratic specification).

Apart from the dummy variables which provide information on uptake of one specific mode of formal or informal childcare, a typology of childcare arrangements was constructed distinguishing i) women who do not rely on any type of formal or informal childcare, ii) women who only rely on informal childcare arrangements (i.e. other household, members, relatives and/or acquaintances), iii) women who rely exclusively on formal childcare arrangements (i.e. crèche or daymother), and iv) women who combine formal and informal childcare arrangements. We used a multinomial logit model to assess the educational gradient in childcare strategy controlling for age of the youngest child:

$$\begin{cases} \dfrac{P(formal)}{P(none)} = a + \sum_{k=1}^{4} b_k EDU_{ki} + c\, AGEKID1_i + c_2 AGEKID1_i^2 \\ \dfrac{P(informal)}{P(none)} = a + \sum_{k=1}^{4} b_k EDU_{ki} + c\, AGEKID1_i + c_2 AGEKID1_i^2 \\ \dfrac{P(in+formal)}{P(none)} = a + \sum_{k=1}^{4} b_k EDU_{ki} + c\, AGEKID1_i + c_2 AGEKID1_i^2 \end{cases}$$

- *Effect of (in)formal childcare on second birth hazards*

The effect of uptake of(in)formal childcare arrangements on second births is assessed using a late-entry discrete-time hazard model where women having different ages and different durations since the birth of their first child at the start of the observation period on 1 October 2001 were followed between 2002 and 2005 to determine whether and when a second child was born (Singer & Willett, 2003):

$$ln\frac{P(BIRTH2=1)}{1-P(BIRTH2=1)} = a + \sum_{t=1}^{5} b_t TIME_{ti} \sum_{k=1}^{4} b_k EDU_{ki} + b_{a1} AGEKID1_i + b_{a2} AGEKID1_i^2 + b_c CARETYPE_i$$

Where the $TIME_{ti}$ are dummy variable denoting the duration since the first birth in years; the EDU_{ki} are dummy variables referring to the highest level of education attained by women on 1 October 2001; $AGEKID_i$ is a time-constant covariate denoting the age of women at the time of the first birth and $CARETYPE_i$ is a dummy-variable indicating uptake of a specific type of (in)formal childcare. Similar to the analysis for uptake, we first estimated a set of models including uptake of one mode of childcare in turn, followed by a second set of models including the typology of childcare arrangements.

3. Results

- *Uptake of (in)formal childcare arrangements*

For women having a first child between 9 months and 2 years and 9 months on 1 October 2001, figure 1 shows the educational gradient in the uptake of formal and informal childcare arrangements. Controlling for age of the first child, a strong positive educational gradient is found for use of crèches with 43,3 per cent of the higher educated women relying on this type of formal childcare compared to only 13,2 percent of the women with no formal education or primary education. Similarly, 31,2 per cent of the women with long type tertiary education make use of daymothers compared to 11 per cent of the women with no formal education or primary education. For uptake of informal childcare, however, the educational gradient is reversed. Among women with long and short type tertiary education 18,5 to 27,7 per cent of the women respectively rely on informal childcare provided by other household members compared to 39,7 to 41,6 per cent of the women with primary education and lower secondary education respectively. Similarly, 24,0 to 39,8 per cent of the women with long and short type tertiary education respectively rely on informal childcare by family members and acquaintances compared to 29,2 to 37,5 per cent among women with primary education or lower secondary education respectively.

FIGURES 1 AND 2 ABOUT HERE

Considering uptake of specific types of informal or formal care separately is ambiguous as women who do not rely on a specific type of (in)formal care may rely on other types of (in)formal care. As focusing on uptake of specific types of (in)formal care may be misleading, a typology of childcare strategies was constructed distinguishing women who i) do not rely on any type of formal or informal care, ii) women who only rely on some type of informal care (other household members, family members or acquaintances), iii) women only relying on some type of informal care (crèche or daymother), and iv) women making use of both formal and informal childcare arrangements (figure 2). Controlling for age of the first child, articulated educational gradients emerge for the typology of childcare arrangements. Among women with no formal education or primary education and women with lower secondary education 34,9 to 45 per cent of the women do not make use of any type of childcare arrangement. In contrast, the share of women with short or long type tertiary education not making use of any type of formal or informal childcare arrangement is limited to 11,7 to 12,1 per cent respectively. Similarly, a negative educational gradient emerges for uptake of informal childcare with 45 per cent of the mothers with no formal education or primary education, 49,3 per cent of the women with lower secondary education and 46,7 per cent of the women with higher secondary education exclusively relying on this type of childcare compared to 33,5 per cent and 19,7 per cent of the women with short and long type tertiary education respectively. In contrast, an articulated positive educational gradient emerges for uptake of formal childcare arrangements with 15,2 per cent of the women without formal education or primary education making use of this type of childcare arrangement compared to 55,3 per cent of the women with long type tertiary education. Similarly, a positive educational gradient is also found for uptake of both formal and informal childcare arrangements with only 4,9 per cent of the women without formal education or primary education combining both types of childcare compared to 14,8 and 13,2 per cent of the women with short and long type tertiary education respectively. In sum, a clear educational gradient in childcare strategies emerges in Belgium with 70 per cent of the higher educated women relying on formal

childcare, 20 per cent making use of informal childcare and only 10 per cent not making use of any type of formal or informal childcare. In contrast, only 20 per cent of the lower educated women take up formal childcare whereas 45 per cent rely on informal childcare arrangements and 35 per cent do not make use of any type of formal or informal childcare arrangement.

- *Effect of childcare arrangements on second birth hazards*

In a first set of discrete-time hazard models we assess the effect of each mode of (in)formal childcare on second birth hazards in the period of 1 to 6 years following the birth of the first child (table 1). In line with expectations, second birth hazards are highest in the period of 2 to 4 years following the birth of the first child and older ages at first birth are associated with increasingly lower second birth hazards. Women with tertiary education have higher second birth hazards, which is consistent with the positive educational gradient of second births in Belgium found earlier (Neels, 2006). Controlling for age at first birth (quadratic specification) and level of education, women whose first child was attending formal daycare around the time of the 2001 census do not show second birth hazards that are significantly higher in the 5 years following the 2001 census. In contrast, women having access to services of a daymother show odds of having a second birth that are 17 per cent higher than women not using a daymother. With respect to informal childcare effects are mixed. Women relaying on childcare by other household members have odds of having a second birth that are 3,3 per cent higher, whereas women having to rely on childcare by relatives and/or acquaintances have odds of having a second child that are 12,8 per cent lower than those of women not relying on these specific modes of informal childcare.

TABLES 1 AND 2 ABOUT HERE

A shortcoming of the models that consider each mode of formal and informal childcare separately is that the control group in each model – i.e. women not making use of that specific mode of childcare – is a very heterogeneous group consisting of women who do not rely on any type of childcare, but also of women who rely on other modes of childcare. Given the need to simultaneously consider uptake of different modes of childcare as well as combined uptake, we estimated a second set of models including the typology of childcare arrangements (table 2). Controlling for level of education and age at first birth, the odds of having a second child are 203 per cent higher for women relying on informal childcare arrangements for their first child compared to women who do not rely on any type of childcare. The effect of formal childcare on second birth hazards is even more articulated, with the odds of having a second child being 253 per cent higher for women making use of formal childcare and 254 per cent higher for women making combined use of formal and informal childcare arrangements compared to women who do not rely on any type of childcare.

FIGURE 3 ABOUT HERE

To assess the differential effect of childcare on second birth hazards by level of education, the interaction between the effects of educational level and the typology of childcare arrangements was added to the model (figure 3). Among women who did not take up formal or informal childcare arrangements at the time of the 2001 census, no educational gradient in second births hazards is found. Significant positive educational gradients in second birth hazards do emerge, however, among women having access to informal childcare arrangements, and particularly women having access to

formal childcare arrangements or a combination of formal and informal childcare arrangements for their first child.

4. Conclusion

Although economic theories of family formation suggests strong socio-economic differentials in the uptake of formal and informal childcare arrangements reflecting the different income positions and opportunity costs of different groups, the empirical literature on the effects of family policies has largely failed to consider eligibility and uptake of family policies at the individual level, as well as population heterogeneity in the uptake and effect of these policies. Using longitudinal individual-level data from the 2001 Census and the National Register, we document socio-economic and educational differentials in the uptake of formal childcare (kindergarten, daycare mothers) and informal childcare arrangements (family or household members) in Belgium in 2001 and analyze the effect on second birth hazards in the period 2002-2005. The results show that higher educated women are much more likely to rely on formal childcare arrangements than middle and particularly lower educated women. Whereas middle educated women are most likely to rely on informal childcare arrangements, lower educated women frequently do not use either formal or informal childcare arrangements, suggesting that these women provide care for their children themselves.

The analysis of the effects of different modes of childcare on second birth hazards shows that models considering each mode of childcare in turn yields small and ambiguous effects, largely consistent with the empirical literature. A shortcoming of models that consider each mode of formal and informal childcare separately is that the control group in each model – i.e. women not making use of that specific mode of childcare – is a very heterogeneous group consisting of women who do not rely on any type of childcare, but also of women who rely on other modes of childcare. Given the need to simultaneously consider uptake of different modes of childcare as well as combined uptake, the model including a typology of childcare arrangements show strong positive effects of uptake of both formal and informal care on second birth hazards. The comparison of women who do not use any formal or informal care arrangement at the time of the 2001 census with women relying on informal, formal or a combination of formal and informal childcare arrangements suggests that access to childcare is vital in reducing opportunity costs, resulting in a strong positive educational gradient in second birth hazards among women having access to informal and particularly formal childcare arrangements, consistent with theoretical expectations.

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Tables & Figures

Figure 1 Gross and net (controlling for age of youngest child) educational differentials in uptake of formal and informal childcare arrangements after first birth, women age 15-49 having one child.

Figure 1a Uptake of formal childcare: Crèche

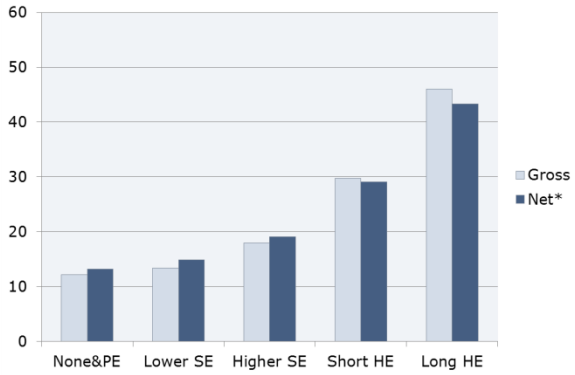


Figure 1b Uptake of formal childcare: daymother

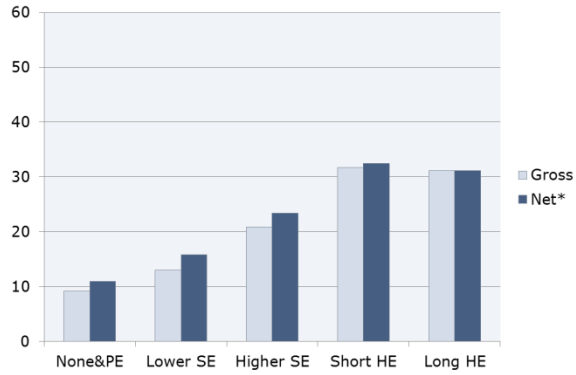


Figure 1c Uptake of informal childcare: other household members

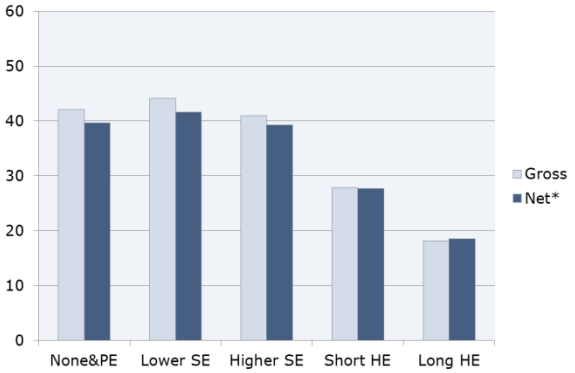
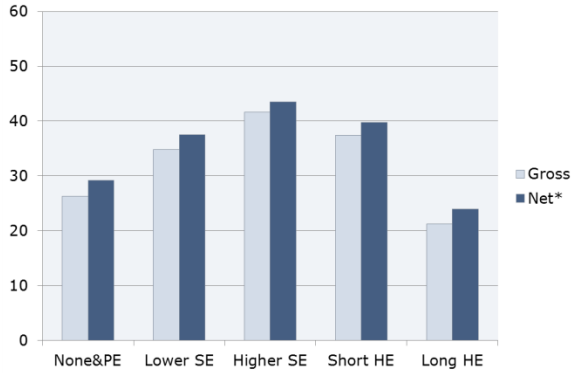


Figure 1d Uptake of informal childcare: Family and acquaintances



* Controlling for age of first child
Source: Belgian ASD Panel, Calculations by authors.

Figure 2 Net educational differential (controlling for age of first child) in childcare strategy following the birth of the first child, women aged 15-49 with one child born in 1999-2000.

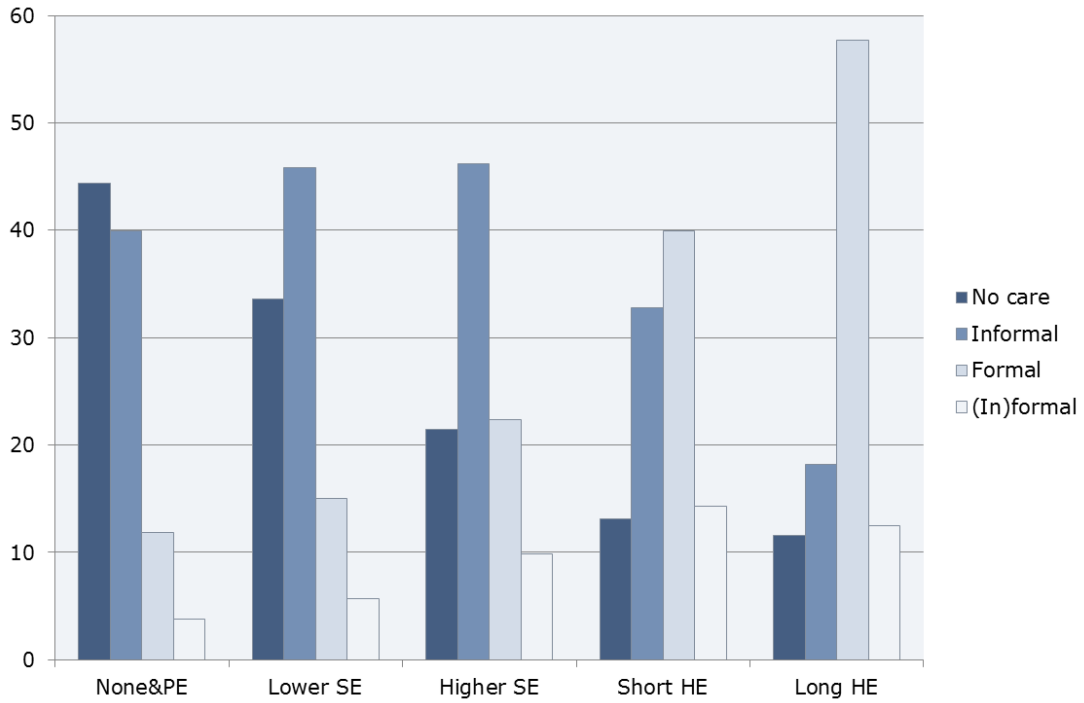


Table 1. Effect of formal and informal childcare arrangements on second birth hazards among women age 15-49 having a first child born in 1999-2000.

	Formal childcare: Creche		Daymother		Informal childcare HH Members		Family/Friends	
Covariates	Exp(b)	Sig.	Exp(b)	Sig.	Exp(b)	Sig.	Exp(b)	Sig.
Age at first birth (time cons)								
. linear	1,276	***	1,266	***	1,278	***	1,287	***
. quadratic	,994	***	,994	***	,994	***	,994	***
Years since first birth								
. 1 yr	-							
. 2 yrs	5,981	***	6,003	***	5,984	***	5,980	***
. 3 yrs	10,675	***	10,737	***	10,681	***	10,691	***
. 4yrs	7,169	***	7,219	***	7,171	***	7,183	***
. 5 yrs	4,577	***	4,610	***	4,578	***	4,585	***
. 6 yrs	3,263	***	3,295	***	3,266	***	3,264	***
Childcare	1,022		1,173	***	1,033	**	,872	***
Educational Level								
. None & Primary	-		-		-			
. Lower Secondary	,816	***	,811	***	,815	***	,825	***
. Higher Secondary	,937	*	,923	*	,937	*	,956	
. Short Tertiary	1,665	***	1,622	***	1,675	***	1,695	***
. Long Tertiary	2,167	***	2,565	***	2,650	***	2,622	***
Constant	,003	***	,003	***	,003	***	,003	***

Source: 2001 Census & National Register
Significance Levels: * p < .050, ** p < .010, *** p < .001.

Table 2. Second birth hazards in the period 2001-2005 by type of childcare arrangement in 2001, women aged 15-49 having a first child born in 1999-2000.

Covariates	Exp(b)	Sig.	Exp(b)	Sig.
Age at first birth (time cons)				
. linear	1,516	***	1,325	***
. quadratic	,992	***	,994	***
Years since first birth				
. 1 yr	-		-	
. 2 yrs	5,916	***	6,119	***
. 3 yrs	10,078	***	10,772	***
. 4yrs	6,506	***	7,123	***
. 5 yrs	4,066	***	4,490	***
. 6 yrs	2,976	***	3,333	***
Childcare				
. no care arrangement	-		-	
. informal care	2,902	***	3,038	***
. formal care	3,969	***	3,532	***
. formal & informal care	3,778	***	3,544	***
Educational Level				
. None & Primary			-	
. Lower Secondary			,816	***
. Higher Secondary			,883	***
. Short Tertiary			1,475	***
. Long Tertiary			2,235	***
Constant			,001	***

Source: 2001 Census & National Register
Significance Levels: * p < .050, ** p < .010, *** p < .001.

Figure 3 The educational gradient of second birth hazards in a model allowing interaction between the effects of educational level and the typology of childcare arrangements