The diffusion of cohabitation and children's risks of family dissolution in Canada

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Research Article

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David Pelletier[1]

Abstract

BACKGROUND
Because cohabiting unions are, on average, less stable than marriages, the diffusion of childbearing within cohabitation could lead to an overall increase in family instability. The possibility that cohabiting families become increasingly stable throughout the diffusion process is, however, seldom studied.

OBJECTIVE
Taking the point of view of Canadian children, we investigated the differential effect of the diffusion of childbearing within cohabitation on married and cohabiting parents' risks of separation. We were especially attentive to the functional form of relationships and to the specific role of selection and causal mechanisms.

METHODS
We used Cox regressions to estimate children's hazards of parental separation up to age 6 according to the prevalence of childbearing within cohabitation in their province and cohort. The analysis is conducted by merging individual survey data on Canadian children born from 1989 to 2004 (NLSCY; n=24,175) with contextual data from various sources.

RESULTS
As childbearing within cohabitation increased in Canadian provinces, cohabiting families remained less stable than married ones, but the stability levels of both converged. The stability gap was only partially explained by the selection of more separation-prone parents into cohabitation; the remaining gap could be associated with the normative context in which family formation occurs.

CONTRIBUTION
Comparing several geographic units and cohorts within the same model allowed us to describe the association between the diffusion process and separation using continuous functions, not only for the hazard ratio but also for its numerator (decreasing separation risks among cohabiting families) and denominator (increasing risks among married families).

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1. Introduction

Recent studies comparing the stability of cohabitation and marriage after the birth of a child reach a similar conclusion: Cohabiting parents have higher rates of union dissolution than their married counterparts (Juby and Marcil-Gratton 2002; Manning, Smock, and Majumdar 2004; Osborne, Manning, and Smock 2007; Tach and Edin 2013). Since the proportion of children born to cohabiting parents is increasing steadily, it could be feared that the total proportion of children who will experience the separation of their parents will increase just as steadily (Jensen and Clausen 2003; Osborne and McLanahan 2007). While single-area or cross-sectional data can indeed give that impression, there exists mounting evidence from studies comparing different regions and/or cohorts that the stability level of cohabitation is itself not stable over time and place. These spatiotemporal variations have been associated with the prevalence of cohabitation in a given society at a given time (Liefbroer and Dourleijn 2006).

Using Canada as a case study, we build on previous research that used the perspective of adults by looking at the same issue from the perspective of children, i.e., we investigate how the risks of family separation for children born to cohabiting or married parents varies according to how advanced the diffusion of childbearing within cohabitation is in their province of residence and cohort of birth. We also try to ascertain whether observed differences in these risks result from selection or causal effects.

2. Background

2.1 Selection and causal effect

The reasons behind the shorter duration of cohabiting unions (or of marriages started in cohabitation) when compared to (direct) marriages are still not clear. Two main mechanisms might be at play: a selection effect and a causal effect (Axinn and Thornton 1992). The former mechanism is straightforward: it emphasizes the fact that individuals who choose cohabitation often exhibit characteristics associated with higher rates of union dissolution, regardless of union type (young age, low education, etc.). Accounting thoroughly for these compositional differences would explain a large part or even the entire stability gap. The latter mechanism is less easily described. It suggests that there is something about the mere experience of living in cohabitation that causes individuals to become more prone to disrupt their union. This could work by fostering a lesser level of commitment between partners or by promoting attitudes favourable to divorce. The real cause behind those individual attitudinal changes could, however, be contextual in nature: the more cohabitation is socially acceptable, the less cohabiting couples feel a social pressure to either marry or end their union.

As the selection and causal mechanisms probably work concurrently, it is difficult to ascertain the specific role of each. The usefulness of the diffusion-of-cohabitation analytical framework derives in part from the way it makes apparent this dynamic relationship between the two mechanisms. Early in the diffusion process, few couples begin their conjugal or family life by cohabiting. Because this behaviour is divergent and socially discouraged (high causal effect), innovators are selected among the individuals who have little to lose in displaying it or who are the least comfortable with the cultural status quo (high selection effect). As growing numbers of couples take the cohabitation route this behaviour becomes more socially acceptable, family laws are slowly adapted to give more recognition to unmarried couples and their families (low causal effect), and adopters now come from a wider range of social backgrounds (low selection effect).

Given that successive cohorts of cohabiting and married couples become increasingly similar (reduced selection effect) and are subject to increasingly similar institutional and normative environments (reduced causal effect), cohabitation and marriage could even become indistinguishable social institutions (Kiernan 2001). Those similarities would extend to stability: dissolution risks of cohabiting unions and marriages are expected to converge over time, at least until cohabitation becomes a majority phenomenon.

2.2 Measuring the effect of the diffusion of cohabitation on couples' stability

Early empirical accounts of the link between the diffusion of cohabitation and the marriage-cohabitation stability gap are based on ad hoc observations of differences between a few specific areas or cohorts. By looking at separate groups of cohorts among US women born between 1928–1957 – a period during which premarital cohabitation increased from 2% to 32% – Schoen (1992) observes a reduction and even the vanishing of premarital cohabitation's negative effect on subsequent marital stability. The higher stability of cohabiting unions and of marriages preceded by cohabitation in Quebec compared to the rest of Canada has also been linked to their higher prevalence in that province (Le Bourdais and Lapierre-Adamcyk 2004; Le Bourdais and Marcil-Gratton 1996; Le Bourdais, Neill, and Marcil-Gratton 2000). The same has been discussed concerning the greater stability of couples who had their first child in Eastern Germany (60% births to cohabiting couples) as opposed to Western Germany (27%) (Schnor 2014).

But it is Liefbroer and Dourleijn's (2006) pan-European study of first union formation that provides the first comprehensive empirical test of the link between the diffusion of cohabitation and couple instability. They compare women according to the type of their first union (a time-varying variable): those married directly (the reference group), those married after a spell of cohabitation, and those currently cohabiting. Their results confirm the convergence hypothesis, but only for the first half of the diffusion process. In countries and periods where more than 50% of women start their first union by cohabiting, the dissolution rate of marriages preceded by cohabitation and of currently cohabiting unions begin to diverge again from those of direct marriages, leading to a U-shaped relationship between the diffusion of cohabitation and the marriage-cohabitation stability gap.

To explain their results, Liefbroer and Dourleijn emphasize the changing role of selection throughout the diffusion of cohabitation. Whereas couples that start their union by cohabiting are a select group (the innovators) at the start of the diffusion, it is the directly married couples that become a highly selected group (the laggards) when cohabitation comes to be the modal way of entering a first union. High religiosity, for instance, could be a major driver of this inversed selection mechanism and ensure the stability of directly married couples. In that situation the stability gap between cohabitation and marriage would reach a minimum near the middle of the diffusion process and start to get larger from then on.

One limitation of the diffusion-of-cohabitation framework for the analysis of relationship instability to date is the isolation in which this effect has usually been treated. There has been little discussion or empirical testing of other contextual characteristics related to the diffusion process that could also affect rates of separation. As disparity in the prevalence of cohabitation between studied regions or periods might only be one of an array of factors explaining the observed stability differences, it is possible that estimates of the impact of the diffusion process have been over- or understated by an omitted-variable bias.

In a more spatially oriented literature, several other contextual factors have been shown to be associated with couples' (either married or cohabiting) propensity to separate or divorce. For instance, voting behaviour – as a proxy for social norms – has been found to correlate with union and fertility behaviour on an aggregate level. In an analysis of Finnish regions, Valkonen et al. (2008) finds that party support is associated with a second-demographic-transition index comprising the rate of divorce and the prevalence of cohabitation. Lesthaeghe and Neidert (2006; 2009) also find a strong association between party support in US presidential elections and behaviours related to the second demographic transition. Kulu (2012) does not find an equivalent relationship in Austria but does show that county-level GDP has a significant and positive impact on the odds of separation. Lyngstad (2011) also finds a positive relationship between average income and divorce risk across Norwegian municipalities.

While most research on the link between the diffusion of cohabitation and separation risks is concerned with adults' union formation and couple stability, the same analytical framework applies if we instead employ the perspective of children and focus on the stability of their family during the diffusion of childbearing within cohabitation. In this alternative perspective, children stop being treated as mere attributes of adults - as is usually the case in retrospective surveys - to become the focal individuals. A child-centered perspective is more easily achieved with child-centered data. These are more often available from panel or cohort surveys.

One important difference between the two perspectives is the range of values for which the process can be analyzed. The diffusion of cohabitation as a family form suitable for childbearing and childrearing is a much more recent phenomenon than that of cohabitation as a premarital union. Moreover, unlike premarital cohabitation, which is now being experienced by practically all married couples in some places, it would be surprising for the proportion of births to cohabiting parents to ever reach 100% because this would mean that marriage is either completely abandoned or, at least, postponed until all fertility is completed. Because of its internal heterogeneity, Canada offers at present an especially wide range of values for this analysis in a single-country setting.

2.3 Cohabitation in the Canadian context

The cultural, religious, and linguistic distinctiveness of the province of Quebec – 79% Francophones, 8% Anglophones, and 13% Allophones[2] – compared with the rest of the country – respectively 4%, 73%, and 23% (Statistics Canada 2015) – has been accompanied by distinct fertility and union behaviours throughout the country's history (Beaujot 2000).

Since the 1980s it has become apparent that Quebecois couples have diverged substantially from those in the rest of Canada in respect to cohabitation. They choose cohabitation over marriage in disproportionate numbers compared to other Canadian (or North American) couples when forming a first union (Dumas and Bélanger 1997) and give birth to more children while cohabiting (Laplante and Fostik 2015). Quebec and the rest of Canada had the same low level of non-marital fertility in 1980 (13%), but divergent growth patterns during the following decades brought this proportion to 63% in Quebec and 27% in the rest of Canada by 2012 (author's calculations from Statistics Canada 2016).

Because of these differences, researchers usually consider Quebec and the rest of Canada to be at different stages in the diffusion of cohabitation (Dumas and Bélanger 1997; Le Bourdais and Lapierre-Adamcyk 2004). Despite these differences, however, children born to cohabiting parents in Quebec have, as

[2] Allophone: Person whose mother tongue is not one of the two official languages of Canada, English and French.

elsewhere, higher odds of family disruption than those born within marriage (e.g., Lardoux and Pelletier 2012), but the stability gap between union types is narrower in Quebec than in the rest of Canada (Le Bourdais, Neill, and Marcil-Gratton 2000).

The striking distinctiveness of union and fertility behaviours in Quebec has had the effect of obscuring lesser but non-trivial differences among the nine other provinces. For instance, New Brunswick's proportion of births to cohabiting parents was exactly twice that of Ontario's in 2006 (30% vs. 15%; author's estimation from census data). Our analysis takes advantage of all interprovincial variation.

3. Method

3.1 Individual-level data and variables

To conduct our analysis we combined information from several nationally representative datasets. Our main source of data is the National Longitudinal Survey of Children and Youth (NLSCY), a large accelerated-design panel survey started in 1994–1995 and ended in 2008–2009. Every two years, successive waves of the NLSCY followed children belonging to the original 1994–1995 cohorts but also added new cohorts of children in an effort to keep the sample representative of Canadian children, both longitudinally and cross-sectionally. The total number of children included at least once in the survey exceeds 68,000.

For analytical purposes, we restricted the sample on several fronts. As most cohorts born after 1994 were only followed up to their sixth anniversary, we limited the observation window to the first six years after birth for all cohorts. At each survey wave we selected children who were in the 4-to-5-year-old group at that time, which resulted in eight independent subsamples of children that were combined for analysis. This selection scheme greatly facilitated the attribution of individual sampling weights, rendering the selected children representative of all children born in Canada from 1989 to 2004 inclusively who still lived in the country at age 4 or 5. While the analysis is limited to a short period during the early life course of children, it is a particularly interesting period because previous studies have shown that the gap in risks of parental separation between cohabitation and marriage is much larger during this early period than later in childhood (Tach and Edin 2013).

Because we wanted to analyze the separation of biological parents, the sample was further restricted by excluding children born outside of a union and children who were adopted or who lived in a foster family at some point during their childhood. In order to accurately measure the influence of geography-based contextual variables, children born outside of the country and those who lived in a

Canadian territory at the time of the survey were also excluded. Less than 1% of eligible children were withdrawn from the sample because of missing information on variables present in the model. For some categorical predictors a missing-value category was created instead of deleting observations. The analytical sample comprises a total of 24,175 children.

We identified parents' union type at the birth of each child and child's age (in months) at which any first parental separation occurred. The year and month of parental separation was clearly declared for the majority of children but imputation was necessary for some. The imputation process was facilitated by the panel structure of the survey: if a child was living with both parents at Wave A but with only one of them at Wave B, the date of parental separation could be safely imputed as being near the middle of the A-B interval.

Also computed from NLSCY data were children's gender and type of place of residence (rural vs. urban), as well as mothers' age at child's birth and education level (high school diploma or less; postsecondary diploma other than university; university diploma). Education level being the only SES variable consistently available for every cohort in the NLSCY, coefficient estimates of this variable in the multivariate models should probably be understood as a general family SES effect rather than as a maternal education effect per se.

As a large part of Quebec's family regime exception is thought to stem from historical and cultural differences (Laplante 2006), we also controlled for children's mother tongue and religion. Because of the high correlation of these variables in the Canadian context – almost every Francophone declared Catholicism as their religion – a single categorical indicator was created combining information from the two variables (English-no religion; English-Catholic; English-Protestant; English-other religions; French-no religion; French-Catholic; others). Language-religion groups have often been an aggregated object of analysis in Canadian sociology and demography (e.g., Laplante 2014).

Because of massive simplifications to the family history questionnaire after the first few waves of the NLSCY, some important individual-level predictors of union dissolution could not be included in our models. Among these are the duration of the parents' union, whether they cohabited before marriage, whether they were previously in a union and/or had children with another spouse/partner, and the child's birth order. The impossibility of controlling for these factors could have various consequences for our estimates.[3] However, including these variables in

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[3] For instance, the fact that within a given sibship the first-born child is slightly more likely to be born within cohabitation than his/her younger siblings means that the marriage-cohabitation stability gap could be underestimated. Indeed, inside such sibships, age at separation would be systematically higher for children born into cohabitation than for children born within marriage. However, according to Statistics Canada's 2006 General Social Survey (GSS), less than 5% of mothers in the same age groups

exploratory models run on the subsample of children for which the information does exist (the first two of eight waves) confirmed their predictive value at the individual level, but it did not influence substantively the parameter estimates of other individual or contextual variables, including that of cohabitation.

3.2 Contextual-level data and variables

To enrich the individual data of the NLSCY we assembled contextual-level information from four national censuses (1991, 1996, 2001, 2006), an aggregated tax-file dataset, and federal election results (1988, 1993, 1997, 2000, 2004), with the aim of synthesizing specific normative and socioeconomic environments. Contextual units were defined at the intersection of provinces (ten) and annual birth cohorts (sixteen) and values of the contextual-level variables were computed for each of the resulting 160 province-cohorts. Children in the NLSCY sample were assigned to one specific province-cohort, based on their province of residence when 4 or 5 years old[4] and their year of birth.

To model the diffusion of childbearing within cohabitation, we calculated a contextual variable using large samples (20% of households) from each quinquennial census. We defined our main explanatory variable as the proportion of children aged 0 who were living with cohabiting parents among children of that age living with both their parents.[5] This statistic is used as a proxy for the prevalence of births to cohabiting parents. While this statistic could have been estimated directly from the NLSCY, the much larger sample size of census data renders census-based estimates more stable from year to year, especially for small provinces.

Results from five federal elections (Elections Canada 2011) were used to calculate provincial proportions of support for right-of-center parties. In the four earlier elections, votes for the Progressive Conservative Party and the Reform Party (renamed the Canadian Alliance in 2000) were combined. As these parties merged in 2003 to form the Conservative Party, only votes for that party were used for the

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as NLSCY's mothers have borne children within cohabitation and within marriage with the same partner [author's own calculations from the 2006 GSS public-use microdata file].

[4] As children's province of birth is unknown in the data, we made the assumption that the province in which children resided when they were 4 or 5 years old is the province in which they spend the majority of their childhood, i.e., the social context in that province is more important for their parents' union behaviours than that of other provinces. As the length of the observation period is of only six years and as interprovincial migration rates for that age group are in the order of 1‰, this assumption probably holds in the majority of cases.

[5] We excluded from the denominator the proportion of children living with a lone-parent because out-of-union and in-union births result from very different processes. The diffusion of cohabitation as an acceptable setting for childbearing and childrearing is better measured by focusing only on the latter. Vitali, Aassve, and Lappegård (2015) used the same approach.

last election. Even if social and fiscal conservatism are often intermingled in Canadian politics, the aim of this variable is to capture the former rather than the latter. Using votes rather than election results gives a better portrait of political affiliation. In the western provinces, Alberta in particular, conservative parties often win the vast majority of electoral ridings, but the expressed votes are more diverse. Finally, median individual income for each province was taken from annual tax-file data collected by the Canadian Revenue Agency and Statistics Canada (2013). Income is measured in thousands of inflation-adjusted Canadian dollars (2011 constant dollars). Whereas the tax-file dataset contains annual information that can be directly associated with province-cohorts, census and election statistics are only available for those specific years when a census or election took place. Annual values for variables derived from these datasets were obtained through linear interpolation between chronologically ordered data points within the same province.

Note that, in contrast to Liefbroer and Dourleijn (2006), we did not introduce dummy variables either for provinces or cohorts in the models. As contextual variables were computed for each province-cohort, including those dummy variables would introduce severe multicollinearity in multivariate models, which can have unexpected results on coefficient estimates, rendering their interpretation murky.

3.3 Survival analysis

We built a survival model to account for the temporal nature of our dependent variable, child's age at parental separation, and for the censoring that stems from various sources – death of a parent, end of observation before exact age 6, and event non-occurrence before that age. Even though age at separation is observed in discrete units (months), we used continuous-time Cox models to analyze the data because of the flexibility of its baseline hazard function. Results from discrete-time logit survival models did not differ substantially from those of the Cox models. Analyses were conducted in Stata 13 with appropriate survey weights and robust estimates of standard errors. The variance of parameter estimates was also corrected to account for the presence of a small percentage of siblings in the dataset. Additional analyses that restricted the sample to only one child per family returned almost identical results.

Because one of our main objectives was to uncover the functional form of the relationship between separation risks and the diffusion of childbearing within cohabitation, we modelled the diffusion variable using natural cubic splines with five knots, in lieu of imposing a predetermined form (linear or quadratic). We interacted the spline-basis variables with parents' union type to pick up divergent patterns for marriage and cohabitation. Spline modelling has the additional advantage of limiting the influence of Quebec's specificity on the overall fitted relationship: the functional form of the relationship is mainly determined by local data availability and individual data points do not overtly influence the general function. This property of spline functions, however, also means that it can pick up local variations that may divert attention from the larger picture in a way that linear and quadratic functions do not.

4. Findings

4.1 Descriptive statistics

Table 1 presents descriptive statistics for all individual and contextual variables included in the models, separately for children born to married (77% of the sample) and cohabiting (23%) parents. The former have, on average, older and more educated mothers than the latter: two characteristics associated with family stability. The two subsamples also have contrasting linguistic and religious compositions, with the children of cohabiting parents being a more homogeneous group (46% French-speaking Catholics), reflecting in part the Quebec/rest of Canada divide. Children born to cohabiting parents are also more likely to declare no religious affiliation.

As for contextual variables, the mean proportion of births within cohabitation over the period was 21%, reflecting the fact that the diffusion of childbearing within cohabitation is still at an early stage, as previously discussed. However, this statistic varied a lot by province and cohort: it was at a minimum in 1989 in Ontario (7%) and at a maximum in 2004 in Quebec (58%). Children born to married parents were, on average, born in province-cohorts with lower proportions of births within cohabitation. Median income in their context of birth was higher, as was the proportion of conservative party voters.

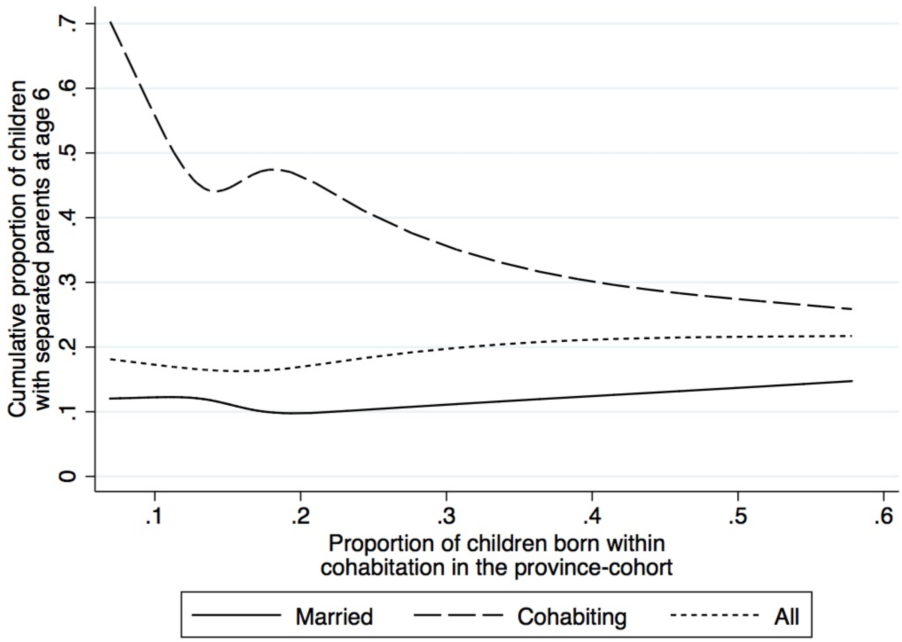
The higher family dissolution risks of children born within cohabitation are evident from Kaplan-Meier estimates. Approximately three times as many children born to cohabiting parents saw them separate before age 6 (38.5% vs. 11.7%). As shown in Figure 1, however, this cumulative probability varied a lot according to the level of diffusion of childbearing within cohabitation in the province-cohort. Throughout the observed range of the diffusion process, children born into cohabitation faced higher risks of parental separation than those born inside marriage, but while the probability of separation remained almost stable for the latter it decreased markedly for the former (from 70% to 26%). When all children were considered together, the probability of separation rose perceptibly but at a very slow pace (from 18% to 22%). Indeed, the increase in stability among cohabiting parents was almost sufficient to mechanically compensate for the shift of births from the high stability group (marriage) to the low stability group (cohabitation).

Table 1: Descriptive statistics (% and means) of the sample, by parents' union type at birth

	Parents' union type at birth		p-value[a]	Total
	Marriage	Cohabitation		
Individual and family variables				
Gender				
Boy	49.1	48.6		49.0
Girl	50.9	51.4		51.0
Mother's age (years)	30.1	27.0	***	29.4
Mother's education level				
High school or less	25.9	38.1	***	28.7
Post secondary, excluding university	48.0	48.4		48.1
University	25.9	13.2	***	23.0
Missing	0.2	0.3		0.2
Language-Religion groups				
English-No religion	16.5	19.7	***	17.3
English-Catholic	23.5	11.3	***	20.6
English-Protestant	20.8	9.9	***	18.2
English-Other religion	11.8	3.8	***	9.9
French-No religion	0.7	5.0	***	1.7
French-Catholic	12.1	46.0	***	20.0
Others	14.7	4.3	***	12.3
Place of residence				
Urban	87.4	84.1	***	86.6
Rural	12.6	15.9	***	13.4
Proportion of parental separation by age 6[b]	11.7	38.5	***	17.9
Contextual variables (province-cohort level)				
Births within cohabitation	18.2	30.9	***	21.2
Median total income ($1,000)	25.1	23.8	***	24.8
Votes for conservative parties	40.2	30.6	***	38.0
N (children)	18,408	5,767		24,175
Weighted proportion	76.6	23.3		100.0

[a] P-value of t tests performed on the difference between marriage and cohabitation.
[b] From Kaplan-Meier estimates of the survival functions.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$
Note: All estimations are weighted.

Figure 1: Estimated cumulative probability of family dissolution by age 6 according to the contextual level of childbearing within cohabitation in the province-cohort of the child, by parents' union type at birth



Note: Cumulative probabilities predicted from three separate Cox models (children born to married parents, children born to cohabiting parents, all children) in which the only independent variables are natural cubic spline representations of the proportion of births within cohabitation with five knots at key percentiles of the distribution.

The observed narrowing of the cohabitation-marriage stability gap over the diffusion process could result from many different underlying mechanisms. It might be the consequence of a declining causal effect of cohabitation on separation risks brought about by the social normalization of childbearing within cohabitation. It might also result from the simple fact that as the diffusion of cohabitation progresses, the characteristics of cohabiting parents come to resemble more those of married parents, i.e., weaker selection effect. This is evident, for instance, from the education variable. The educational advantage of married mothers is considerably reduced as the diffusion progresses: the proportion of university graduates increases faster among cohabiting mothers than among married mothers, and the same is true of the decrease in the proportion of mothers whose highest diploma is high school or less (results not shown).

4.2 Multivariate analysis

The results of three nested Cox regressions are presented in Table 2. The first model comprises only individual covariates, the second one adds two contextual variables (median income and percentage of conservative voters), and the third one tests whether the diffusion of childbearing within cohabitation is associated with the risk of separation over all the previous variables.

As can be seen in Model 1, and as was expected from previously published analyses, mother's age has an important negative effect on family dissolution risks, as does mother's education level. Children living in rural areas have lower risks of family dissolution, but gender is not associated with those risks. The effect sizes of these four variables are not affected by the introduction of contextual variables in Models 2 and 3. When children born to married and cohabiting parents are modeled separately (result not shown), coefficients of these four variables are almost identical for both union types. This is consistent with recent findings in the United States, showing that socioeconomic characteristics are associated with union stability in a very similar way for both married and cohabiting parents (Tach and Edin 2013).

Apart from the diffusion variables, only the language-religion variable differs significantly between the separate models; an interaction variable is thus included in the models in Table 2. Among children born to married parents, those who did not declare a religion face higher risks of family dissolution than English-speaking Catholics (the reference group). The association is not significant for the French-speaking subgroup, but this might be related to their small sample size. Children in the 'Others' group are less at risk of parental separation. Among children born to cohabiting parents, risks of parental separation vary less by religion than by language. When only individual covariates are present in the model (Model 1), risks are significantly lower for both groups of Francophones compared to English-speaking Catholics (French-speaking Catholic's HR = exp(0.08 – 0.69) = 0.54 and Francophones without religion's HR = exp(0.698 – 1.204) = 0.60). The introduction of the diffusion variables (Model 3), however, reduces these differences.

Median income in the province-cohort is negatively associated with the risks of separation only in the third model; an opposite association than that previously identified in some European countries. Contrary to expectations, the contextual proportion of votes for conservative parties is not associated with risks of separation; this is true in the presented combined model as well as in models estimated separately by parents' union type at birth (not shown).

Table 2: Cox regression estimates of the effect of individual and contextual variables on the risk of parental separation before age 6, Canada, birth cohorts 1989–2004

	Model 1			Model 2			Model 3		
Individual and family variables	b		s.e.	b		s.e.	b		s.e.
Parents' union type at birth [ref. Marriage]									
Cohabitation	1.541	***	0.126	1.539	***	0.126	3.026	***	0.566
Gender [ref. Boy]									
Girl	0.048		0.049	0.049		0.049	0.049		0.049
Mother's age (years)	-0.061	***	0.006	-0.061	***	0.006	-0.061	***	0.006
Mother's education level [ref. Postsecondary, excluding University]									
High school or less	0.178	**	0.060	0.177	**	0.061	0.169	**	0.060
University	-0.433	***	0.087	-0.433	***	0.087	-0.420	***	0.087
Missing	0.241		0.429	0.250		0.430	0.353		0.433
Language-Religion group [ref. English-Catholic]									
English-No religion	0.505	***	0.111	0.513	***	0.112	0.538	***	0.113
English-Protestant	0.121		0.109	0.119		0.109	0.128		0.110
English-Other religion	-0.191		0.143	-0.186		0.143	-0.161		0.143
French-No religion	0.698		0.434	0.648		0.435	0.332		0.442
French-Catholic	0.080		0.145	0.029		0.147	-0.204		0.176
Others	-0.375	*	0.166	-0.379	*	0.164	-0.440	*	0.165
Parents' union type at birth X Language-Religion group									
Cohabitation X English-No religion	-0.498	**	0.158	-0.499	**	0.159	-0.519	***	0.157
Cohabitation X English-Protestant	-0.289	†	0.169	-0.294	†	0.169	-0.339	*	0.168
Cohabitation X English-Other religion	0.098		0.219	0.100		0.219	0.116		0.215
Cohabitation X French-No religion	-1.204	*	0.489	-1.205	*	0.490	-0.668		0.515
Cohabitation X French-Catholic	-0.69	***	0.180	-0.695	***	0.183	-0.297		0.241
Cohabitation X Others	0.568	*	0.240	0.553	*	0.240	0.659	**	0.248
Place of residence [ref. Urban]									
Rural	-0.378	***	0.062	-0.384	***	0.062	-0.372	***	0.063
Contextual variables (province-cohort level)									
Median income (1000$)				-0.010		0.009	-0.023	*	0.010
% Votes for conservative parties				-0.131		0.222	0.360		0.263
% Births within cohabitation (natural cubic splines with 5 knots)									
First spline basis							0.507		3.246
Second spline basis							-217.800	†	131.390
Third spline basis							832.136	†	426.502
Fourth spline basis							-799.016	*	376.103
Parents' union type at birth X % Births within cohabitation									
Cohabitation X First spline basis							-13.169	**	4.855
Cohabitation X Second spline basis							509.313	**	192.163
Cohabitation X Third spline basis							-1552.365	*	612.431
Cohabitation X Fourth spline basis							1245.328	*	529.502

† p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001. Sampling weights applied. Robust standard errors adjusted for in-sibships correlation.

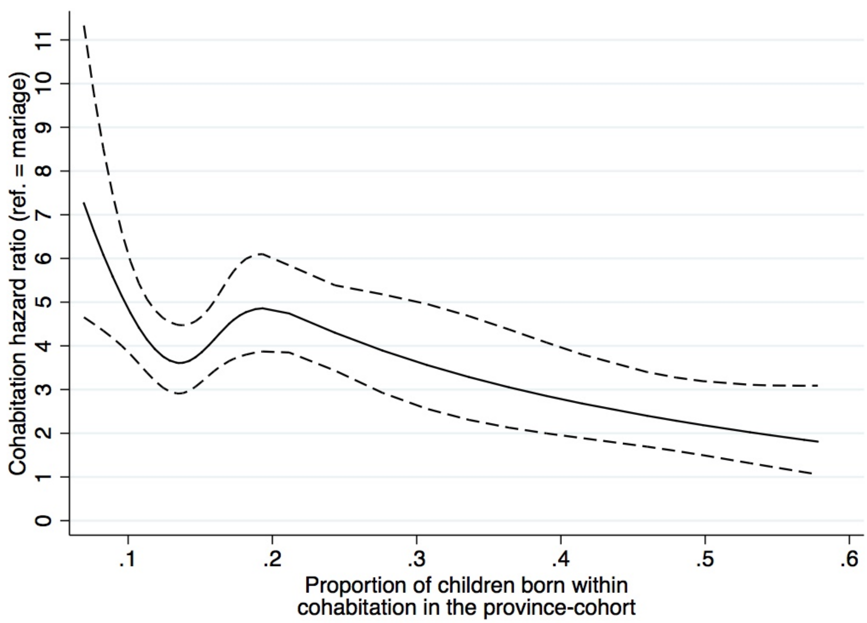
Being born to cohabiting parents was identified as a large and highly significant predictor of family instability in all three multivariate models (first row of Table 2). However, as the union-type variable enters in (significant) interactions with language-religion groups (Models 1 to 3) as well as with the prevalence of births within cohabitation (spline variables in Model 3), its coefficients need to be interpreted carefully. As coefficients of spline-basis variables are also difficult to evaluate on their own, model predictions are an easier way to represent and interpret results regarding parents' union type and its interaction with the prevalence of births within cohabitation.

4.3 Model predictions of the association between the diffusion of childbearing within cohabitation and family dissolution risks

Figure 2 plots the cohabitation-vs.-marriage hazard ratio of parental separation from Model 3. All covariates were set to their overall mean; only the contextual proportion of births within cohabitation was allowed to vary. After a steep decline at the very beginning of the process the hazard ratio increased slightly when the proportion of births within cohabitation in the province-cohort approached 20%, and then resumed its downward trend, but at a slower pace. This non-linear decline picked up by the spline function reflects the fact that this function is a synthetic combination of data from ten provinces that reached different stages of the diffusion at different periods. Overall, the ratio decreased from 7 to 2 during the observed range of the process in Canada. Despite this impressive decline, the ratio remained significantly larger than 1 over the entire range. However, if the declining trend continues it is probable that the hazard ratio will cease to be significant in the near future.

As can be seen in Figure 3, controlling for the available covariates had the effect of decreasing the magnitude of the hazard ratio between the two groups, but only in the first part of the process when the selection effect was large and parents in the two groups were very different. Later on, when selection declined and parents became more similar on those observed characteristics, controlling for these covariates did not modify the observed relationship much.

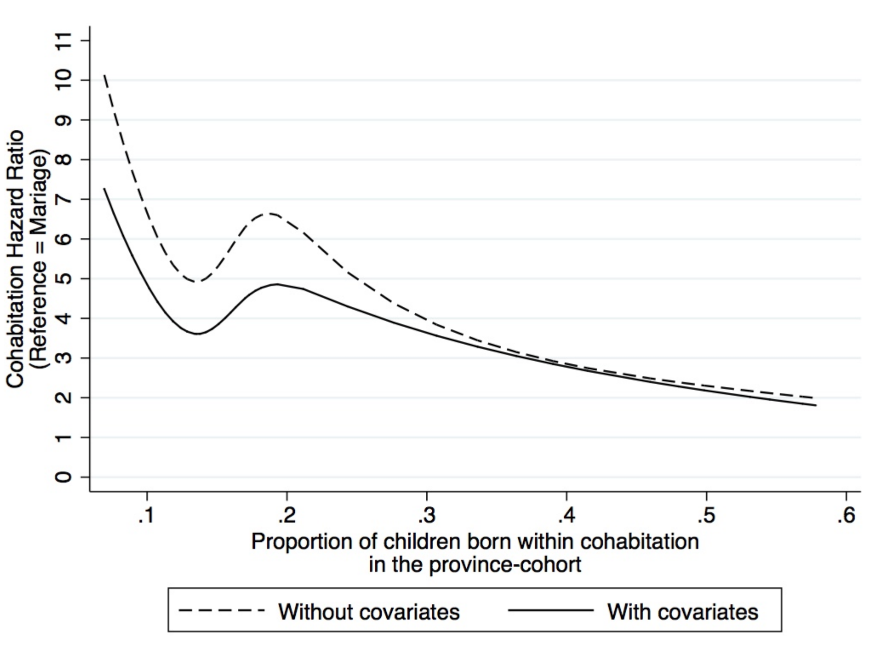
Figure 2: Cohabitation-to-marriage hazard ratio of family dissolution (plus confidence intervals) according to the contextual level of childbearing within cohabitation (from Model 3 in Table 2)



Note: Hazard ratio predicted from Model 3 in Table 2 for individuals whose characteristics were set to the overall means (see Table 1).

As previously discussed, important variables associated with both selection and risks of family dissolution, like parents' fertility history or their own experience of family dissolution during childhood, could not be included as predictors. It could thus be assumed that inclusion of these variables would have lowered even more the fitted hazard ratio function, but we do not think that this would be the case. Indeed, accounting for unobserved selection effects through the joint modelling of the probability of birth inside cohabitation and the risk of separation after birth, a methodology developed by Lillard, Brien, and Waite (1995), did not lead to substantial changes in coefficients (results not shown). Moreover, the correlation between both equations' residual term was very small (–0.06) and not significant. This indicates that sources of selection missing from the presented models do not add a substantial and independent supplementary bias to our results.

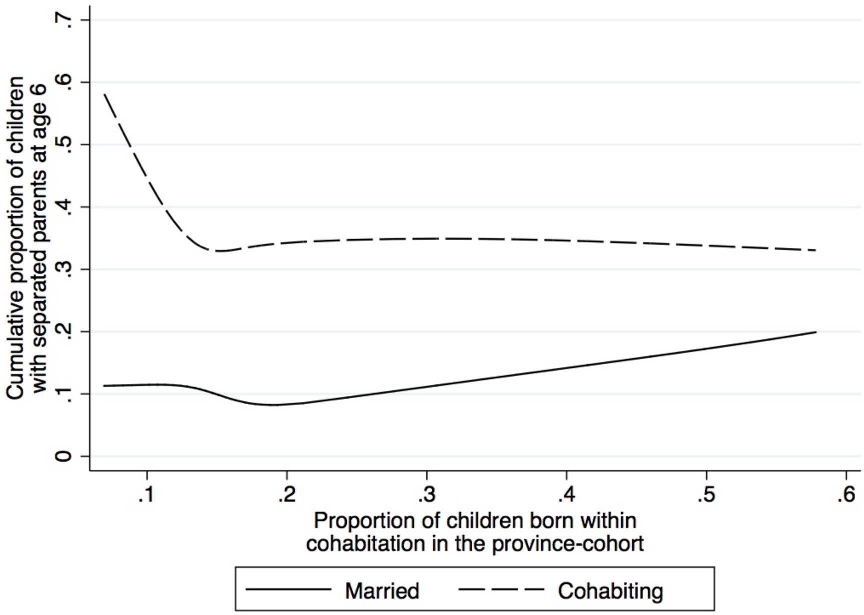
Figure 3: Cohabitation-to-marriage hazard ratio of family dissolution according to the contextual level of childbearing within cohabitation without and with other covariates



Note: Hazard ratio predicted from a model where the only independent variables are parents' union type and natural cubic spline representations of the proportion of births within cohabitation (dashed line) and from Model 3 in Table 2 for individuals whose characteristics are set to their overall mean (full line).

How the fitted hazard ratio emerges from the evolution of its numerator (the hazard of parental separation among children born within cohabitation) and its denominator (the hazard of parental separation among children born inside marriage) is also very instructive. The corresponding cumulative probabilities of parental separation are depicted in Figure 4, again from Model 3 and with all covariates set to their overall mean. In contrast to the unconditional probabilities of Figure 1, after an early and rapid decline the fitted probabilities of Figure 4 showed a quasi-stabilization of separation risks among children of cohabiters when the diffusion of childbearing within cohabitation exceeded 15%. The continued decline of the hazard ratio in the following part of the process was actually driven by the increase of separation risks among children of married parents. This seems to indicate that the overall increase in family instability during the diffusion process is due less to an increase in cohabitation levels than to a new general standard of instability affecting all couples.

Figure 4: Fitted cumulative probability of family dissolution by age 6 according to the contextual level of childbearing within cohabitation in the province-cohort of the child, by parents' union type at birth (from Model 3 in Table 2)



Note: Cumulative probabilities predicted from Model 3 in Table 2 for synthetic individuals whose characteristics were all set to their overall mean (see Table 1).

5. Discussion

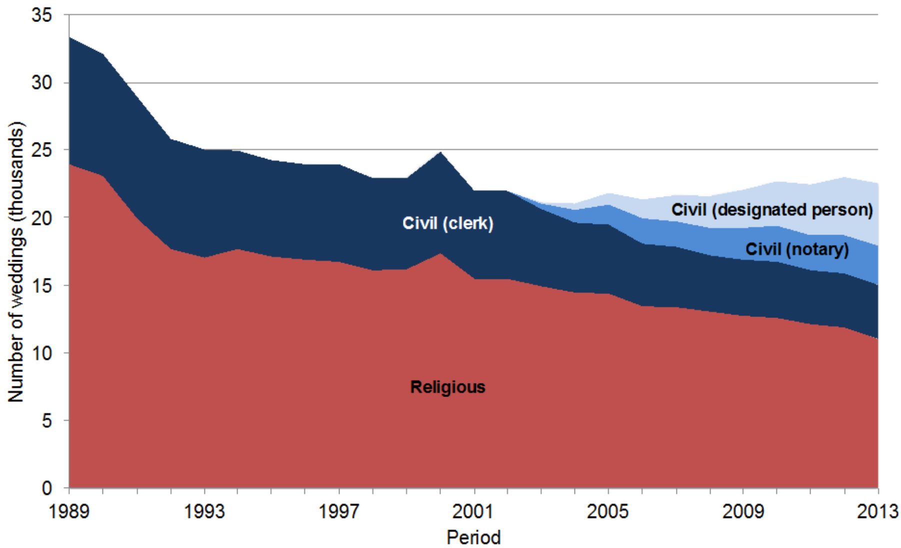
By analyzing the early family trajectory of cohorts of Canadian children born between 1989 and 2004, we observed that the diffusion of childbearing within cohabitation was associated with a convergence of family dissolution risks between children born to married and children born to cohabiting parents. This convergence was still evident even after available controls were included, indicating that selection plays only a partial role in explaining the stability gap between married and cohabiting families. The remaining gap, which is significant throughout the observed range of the diffusion process, must be attributed to a so-called 'causal' effect of cohabitation on family dissolution risks. How this causal mechanism plays out is not explained by our analysis, but the fact that it gets smaller when cohabitation becomes more frequent indicates societal causes rather than an inherent effect of the unmarried cohabitation experience. Institutional adaptations to and less unfavourable attitudes towards the behaviour of childbearing within cohabitation that took place along its social diffusion could have induced this convergence of risks.

The convergence of parental separation risks that we observed for Canadian children contrasts sharply with the U-shaped pattern identified by Liefbroer and Dourleijn (2006) using data on first union formation in sixteen European countries. Despite their common interest, however, the two studies differ in several aspects, making their results difficult to compare (children as units rather than couples, two union types at birth rather than three time-varying first union types, Canada rather than Europe, etc.). For one, births can only occur within 'fertile' unions and these are only a subset (probably the most stable one) of all the unions analyzed by Liefbroer and Dourleijn. Keeping in mind the caveats of the comparison, one can still observe that the different functional forms identified in the two studies result mainly from the contrasting behaviour of the denominator of their respective hazard ratios. Whereas the dissolution risk of directly married couples went down in Europe during the diffusion of premarital cohabitation, the family dissolution risk of children born within marriage actually went up during the latter part of the observed range of the diffusion of childbearing within cohabiting in Canada, controlling for other factors in the models (Figure 4). Liefbroer and Dourleijn attributed the widening of the stability gap between direct marriage on the one hand and formerly or currently cohabiting couples on the other (in the second part of the process) to the increased stability attained by direct marriages through an inversed selection effect, especially in relation to religious beliefs. The equivalent assumption here, i.e., that married parents are becoming an increasingly select and stable group, does not hold.

Indeed, vital statistics for the province of Quebec seem to indicate that married couples are not becoming more selected, at least in regards to religiosity. While the total first marriage rate of Quebec's women plummeted from 840‰ in 1971 to 315‰ in 2011, the share of religious marriages among all marriages fell from 95% to 54%. Not only does the link between religion and marriage continue to dissipate at this very low marriage rate, but civil marriages themselves are also moving away, at least symbolically, from the law and the state (Figure 5). Since a provincial marriage legislation change in 2002 allowed a 'designated person' (family member, friend, or any other individual chosen by the couple) to officiate the civil wedding ceremony in lieu of a clerk of the court, this option has grown tremendously in popularity and now represents 40% of civil marriages (Binette Charbonneau 2014). Instauration of same-sex marriage in Canada in the early 2000s also exemplifies this renewed heterogeneity of marriage and of couples who still want to enter into it. These statistics all point toward a continued deinstitutionalization of marriage in

Canada and cast doubt on theoretical interpretations based on its heightened selectivity.

Figure 5: Number of weddings according to type of celebration, Quebec, 1989–2013



Source: Institut de la statistique du Québec (Binette Charbonneau 2014).
Note: A "designated person" is any individual chosen by the couple (usually a friend or family member) to officiate the wedding ceremony.

One of the most important limitations of our study concerns Quebec's cultural exceptionalism. Because the diffusion of cohabitation is much further ahead in this province, values of the main explanatory variable overlapped very little during the analyzed period for Quebec (28% to 58% of births within cohabitation) and the rest of Canada (7% to 31%). Quebec's specificity, however, does not affect our description of the early stages of the process, because we were careful to use a flexible and locally influenced function to model it, i.e., we used splines rather than a linear or quadratic function. Indeed, removing Quebecois children entirely from the estimated models barely affects the results presented in Figures 2 to 4 for the 7% to 28% interval. However, the combination of this cultural specificity and of a localized function means that our estimates for the end of the diffusion process are almost exclusively based on the experience of children from Quebec. As nobody can predict whether the nine other provinces will follow in Quebec's footsteps all through the diffusion process, our results are better interpreted as a synthetic portrait of Canadian cohorts from the 1990s and early 2000s than as a projection of things to come. Indeed, the increase in the parental separation rate for children born within marriage and its stabilisation for those born within cohabitation in the latter part of the process (see Figure 4) could well be an artefact of Quebec's specificity rather than a true effect of the diffusion of childbearing within cohabitation. To better assess this possibility, a logical next step to follow the present analysis should be to include Canadian provinces in a much larger comparative framework, comprised of countries or regions that cover more densely the whole range of the prevalence of births within cohabitation.

In an analysis similar to our own, but with data on Eastern and Western German couples around the time of their first childbirth, Schnor (2014) obtained results that support ours. Even though, in that case, observed and unobserved selection played a much more significant role in explaining the gap between the family dissolution risks of children born to cohabiting and those born to married parents, it could not explain why cohabiting couples were more stable when levels of childbearing within cohabitation were high (Eastern Germany) than when they were low (Western Germany). Again, this result is indicative of a contextual effect on family dissolution risks.

This effect could be the result of the diffusion of cohabitation-related behaviours itself, or that of yet-unmeasured normative, attitudinal, and institutional factors that change concurrently with the diffusion of union and fertility behaviours. As Canadian social survey data lacks appropriate records of attitudes, especially on trends at subnational levels, we tried to include such an indicator of normative context through the use of electoral results. However, this contextual variable had no significant effect on family dissolution risks in our model, perhaps because province-cohorts are not the adequate contextual units in which to analyze this relationship, or because the connection between party support and social norms or moral values regarding cohabitation is not proximal enough. Voting behaviour during a specific election is indeed dependent on many economic and social issues, local as well as national. Parties can gain or lose support faster than values and norms concerning cohabitation are expected to change or, on the contrary, they can see traditional regional allegiance being maintained despite social/moral changes. Additional research is clearly needed that would include better, more proximate indicators of the normative and institutional environment of families in order to explain why, as the diffusion of cohabitation progresses, risks of family dissolution converge for children born to married and cohabiting parents.

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