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Background

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Quebec's Baby Bonus: Can Public Policy Raise Fertility?

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In 1988, Quebec introduced the Allowance for Newborn Children, a pro-natalist child benefit that paid up to \$8,000 to a family after the birth of a child. Was the program successful? It achieved its goal of increasing family size, but only at a high cost per additional birth. Each child who would not have been born in the absence of the incentive cost the public purse more than \$15,000. The main policy lesson from this episode is that, even if the response to an incentive policy is strong, the effective cost per desired result may be very high.

Fertility rates across the countries of the Organisation for Economic Co-operation and Development (OECD) have declined sharply since the 1960s. This decrease raises public policy concerns because the funding of many social programs, such as public pensions and health care, relies on transfers across generations. Elderly citizens receive benefits funded by younger workers, who, in turn, expect to be supported in their retirement by the next generation of taxpayers. As successive generations shrink in size, these fiscal arrangements come under pressure. In addition, some people fear that dwindling populations may threaten the vitality of various cultures whose survival depends on a critical mass of participants.

These concerns have led governments to create tax and transfer policies aimed at influencing family decisions as intimate as those surrounding fertility. Of the 29 OECD countries, 26 give families with children special treatment through the tax and transfer system (OECD 2000).

In more than half of OECD countries, per child tax benefits increase with the number of children in the family.¹ This policy structure implies that the policymakers' goal is to

I wish to thank Shay Aba, Danielle Goldfarb, Jack Mintz, Finn Poschmann, John Richards, and François Vaillancourt for helpful comments.

1 The case of Canada is complicated. The Canada Child Tax Benefit increases with the number of children, but in some provinces the National Child Benefit Supplement decreases with the number of children.

directly influence families' fertility decisions. If the goal were simply to compensate families for the extra costs of having children, the incremental benefit would shrink as the number of children grew. The more children a family has, the more people there are to spread household expenses over and, hence, the incremental cost per child.² Thus, an increasing per child benefit suggests that pro-natalist tax policy is on the minds of policymakers — as in Quebec through most of the 1990s.

Quebec's Baby Bonus: The Allowance for Newborn Children

In its May 1988 budget, the Quebec government introduced a baby bonus called the Allowance for Newborn Children (ANC). That the reasoning behind the new policy was pro-natalist was made clear by Liberal Finance Minister Gérard-D. Lévesque, who said, "The fall in birth rates is a sign of a people in decline."³ In the months before the budget, both the governing Quebec Liberals and the opposition Parti Québécois had released policy papers on the province's fertility problem.⁴ So it appears the program's introduction was met with broad support.

Payments under the ANC took the following form. Initially, families received \$500 on the birth of their first child, \$500 for a second child, and the first of eight quarterly payments of \$375 (totaling \$3,000) when a third or subsequent child joined the household. By 1992, the benefit grew to \$500 for a first child, \$1,000 for a second, and 20 quarterly payments of \$400 (totaling \$8,000) for a third or subsequent child. These amounts were not taxable under either the federal or the Quebec income tax.

In 1997, the Quebec government canceled the ANC.⁵ Minister of Families and Children Nicole Léger called the program a "lamentable failure."⁶ But was it a failure on its own terms? The balance of this *Backgrounder* aims to evaluate the policy's effect on fertility decisions. I find evidence from both birth registry data and other household-level data that the policy was successful in increasing fertility in Quebec. My calculations suggest that 93,000 births between 1989 and 1996 may be attributed to the program. Each additional child cost about \$15,000 in public funds.

Evidence from Birth Registry Data

To analyze fertility trends, I use government birth registry data. From these statistics, I can construct a standard demographic measure of fertility called the *total fertility rate*

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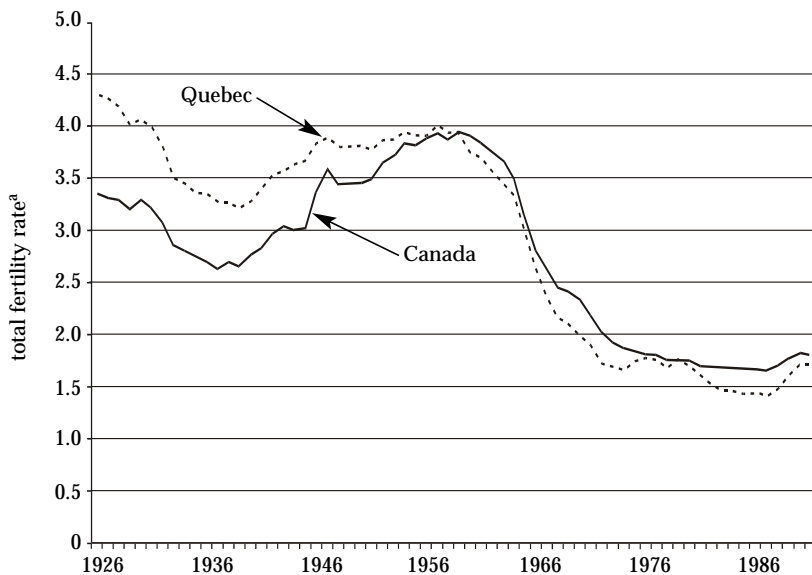
2 A family with two children is likely to have a larger house and car than a family with no children. Adding a third child is unlikely to add as much to the cost of maintaining the household, implying a lower incremental cost in moving from two children to three than in going from none to one. See Boessenkool and Davies (1998) for a thorough discussion of equity and family taxation.

3 "Baisse d'impôts pour tous," *La Presse* (Montreal), May 13, 1988, p. A1; author's translation.

4 For details, see "Have more babies, Liberals say," *Montreal Gazette*, February 28, 1988, p. A1; and Robinson (1988).

5 See Baril, Lefebvre, and Merrigan (2000) for a description and analysis of the pre-1997 and post-1997 Quebec family benefit systems.

6 Quoted in "Les 'bébé-bonus' ont stimulé la natalité au Québec," *La Presse* (Montreal), January 30, 2001, p. A1; author's translation.

Figure 1: *Total Fertility Rates, Quebec and Canada, 1926–91*

^a For the definition of total fertility rate, see the text.

Sources: Statistics Canada; author's calculations.

(TFR), which is an estimate of the number of children who will be born to a typical woman during her child-bearing years, using the fertility patterns observed in a given year.⁷

Figure 1 graphs the TFRs for Quebec and Canada for 1926 through 1991. Quebec women's fertility rate was higher than the Canadian average in the first half of the twentieth century, but the two changed relative positions in 1959. From the 1960s, one can see clearly the end of the baby boom as the TFRs drop sharply.

Figure 1 takes us to the time of the introduction of the ANC. To analyze the effects of that policy, I take a *quasi-experimental approach*, a method that uses data from a policy change as though it were a laboratory experiment. Those affected by the policy are the treatment group. The key to this type of analysis is finding an appropriate control group to

compare with the treatment group so that researchers can infer what would have happened to the latter in the absence of the policy. I apply this methodology to government birth registry data, implementing two treatment-versus-control comparisons.

An Overall Comparison

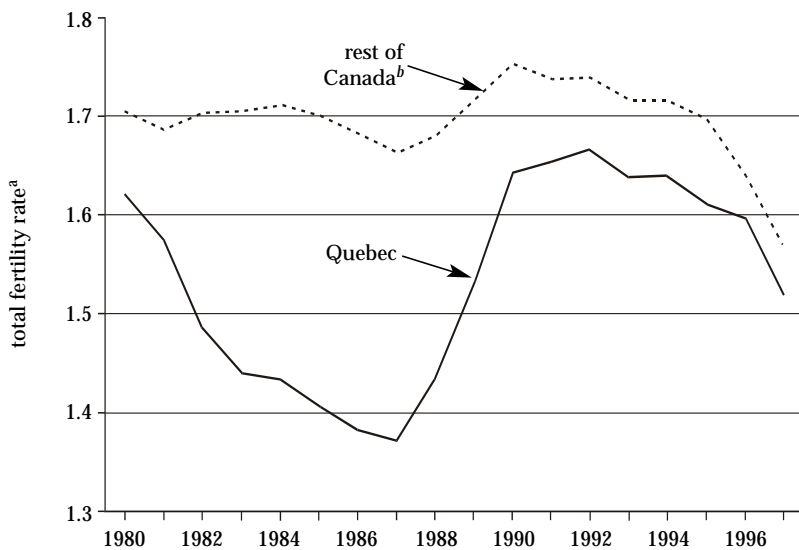
The first comparison I draw is between the fertility of Quebecers and the fertility of women in the rest of Canada (ROC). My assumption is that, in the absence of the policy, the fertility of women in Quebec would have followed the same trends as women elsewhere in the country. If this premise is true, then the ROC is an appropriate control group. (Note that I assume not a lack of differences in the characteristics of Quebecers and the residents of the ROC, only that these differences remain constant through time. Thus, the comparison is not biased by any constant differences between the treatment and control groups, even if they are unobservable or hard to measure.)

The TFRs of Quebec and of the ROC diverged through the 1980s (see Figure 2). The largest gap occurred in 1986, when it reached 0.300 children per woman. The gap narrowed slightly in 1987 and 1988, before the ANC could have affected fertility. And starting in 1989, the spread between the TFRs in Quebec and those in the ROC shrank dramatically and quickly. Between 1989 and 1996, the gap closed by 86 percent, from 0.290 to 0.041 children per woman. Through the 1990s, the gap was fairly constant at about 0.08 children per woman. In brief, Figure 2 provides some initial evidence that the ANC was having an effect on the fertility decisions of women in Quebec.

What if some other fertility-influencing event affected Quebec society at approximately the same time the policy was introduced? For example, political events or a change in

⁷ More precise details on the total fertility rate calculations appear in Milligan (2001).

Figure 2: *Total Fertility Rates, Quebec and the Rest of Canada, 1980-97*



^a For the definition of total fertility rate, see the text.

^b The rest of Canada here excludes both Quebec and Newfoundland; the latter is excluded because data are not available for all years.

Sources: Statistics Canada; author's calculations.

social attitudes might have inspired a general increase in concern about declining birth rates in Quebec. In that case, the increase in fertility should be attributed to the social change, rather than to the ANC. Most analysts agree that political and social attitudes toward fertility historically have been more intense in Quebec than in the ROC.⁸ However, we lack clear evidence of a *great* increase in these concerns in the late 1980s that could have been responsible for the great increase in fertility evident in Figure 2. As already mentioned, the stated political motivation for the introduction of the program arose in response to a perceived *lack* of fertility.

First and Third Births

Even if Quebec society experienced some great shift contemporaneous with the introduction of the ANC, a further quasi-experimental comparison is still possible. Because the ANC benefits for a third or subsequent birth were much larger than

for a first child, a comparison of third and first births among Quebec women with third and first births among other Canadian women removes from the analysis the statistically pernicious influence of any societal change common to Quebecers. In other words, so long as no societal change in Quebec selectively occurred only to the set of families that had a third birth, the comparison is unbiased.

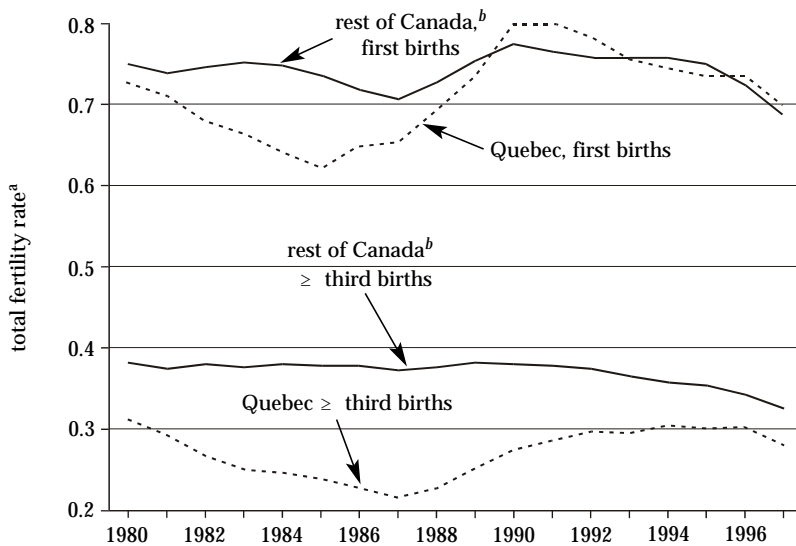
The TFRs of Quebec women, as measured by those with a first birth and those with a third or subsequent birth, certainly did grow in comparison with the ROC (see Figure 3). The rate of first births in Quebec rose from 0.656 per woman in 1987 to 0.755 in 1993, an increase of 15 percent.⁹ The increase in the ROC over the same period was 7 percent. In contrast, the rate for third and subsequent births in Quebec increased by 35 percent, from 0.217 per woman in 1987 to 0.294 in 1993, while falling elsewhere in Canada by 3 percent. This much stronger response among Quebec women provides further evidence that the ANC was influencing their family decisions.

Overall, the fertility behavior observed in Quebec lines up very well with the incentives families faced under the ANC.

8 Following the Quiet Revolution, for example, numerous social indicators suggested a radical response to the shrinking role of the Catholic church in public and private life, including a drop in fertility that may have been a reaction to the church's earlier focus on the "revenge of the cradle."

9 The 0.755 rate of first births can be interpreted as implying that 75.5 percent of women had at least one child during their child-bearing years.

Figure 3: *First versus Third and Subsequent Births, Quebec and the Rest of Canada, 1980–97*



^a For the definition of total fertility rate, see the text.

^b The rest of Canada here excludes both Quebec and Newfoundland; the latter is excluded because data are not available for all years.

Sources: Statistics Canada; author's calculations.

Other Evidence

Analysis of government birth registry data is limiting. Many important determinants of family decisions cannot be addressed using aggregate numbers. For example, changes in family income or education that differed across provinces may have driven the changes in fertility. In other related work (Milligan 2001), I use family-level data from the Canadian censuses of 1991 and 1996. With these data, I can hold constant, in the statistical sense, the effects of family characteristics and economic trends that differ across provinces,¹⁰ permitting me to isolate the effect of the policy changes. So, for example, I can control for any fertility-changing influence the early 1990s' recession had on residents of different provinces. Similarly, by controlling for marital status and immigration background, I can separate the effect of the policy from the effects of marriage and immigration differences.¹¹

I also statistically control for any constant differences in the fertility behavior of women in Quebec and those in the ROC. Many societal factors may differ between Quebec and the other provinces. So long as these differences are constant through the time period, they cannot explain the relative *growth* in the fertility of Quebec women. In addition, I control for overall trends in fertility common to all Canadian women. This set of controls allows me to isolate the change in fertility in Quebec relative to that in the ROC, holding constant the relevant family and economic characteristics.

Calculations with the census data confirm the results from government birth registry data. Indeed, when I add controls for household and provincial factors, the estimated effect of the ANC becomes even larger. For example, provincial education spending per pupil has a positive influence on families' fertility decisions, but through the early 1990s spending per pupil in Quebec fell relative to that in the rest of the country. Thus, in the absence of the ANC, fertility in Quebec might have fallen even farther behind the rest of Canada. The implication is that the effect of the program is even larger than indicated by the narrowing of the fertility rates shown in Figures 2 and 3.

¹⁰ Specifically, I control for the effect of the pre-existing number of children; the marital status of the mother; the education level, age, immigrant status, and mother tongue of each parent; family income; rural versus urban residence; growth of provincial gross domestic product; provincial education spending; and provincial net migration rates.

¹¹ Regression results indicate that married people were more likely to react to the program. However, immigrants and non-immigrants had no difference in their reactions to the program, with everything else held constant. See Milligan (2001) for details on these and other checks on the robustness of the results.

An increase in annual benefits of \$1,000 was associated with a 16.9 percent increase in the probability of having a child.

In Milligan (2001), I also take account of the multitude of other tax credits and transfers that are paid to families with children in Quebec and in all of Canada. By comparing fertility decisions with the dollar value of benefits that a family would receive if it had one more child, I obtain estimates of the sensitivity of fertility to benefits. These estimates suggest that an increase in annual benefits of \$1,000 (in constant 1995 dollars) was associated with a 16.9 percent increase in the probability of having a child.

Duclos, Lefebvre, and Merrigan (2001) explore the ANC using an alternative data set and empirical strategy. They find complementary and confirmatory evidence on the positive impact of the ANC on fertility over this time period.¹²

How Many Additional Children Were There?

To find out how many births one can attribute to the ANC, I construct a simulation to answer the following question: what would fertility have been like in Quebec had no ANC been introduced in 1988?¹³ To do this, I assume that the ROC-Quebec fertility gap that existed before the program remained constant over the next eight years. In other words, I follow through the consequences of assuming that fertility in Quebec between 1989 and 1996 followed the same trend as in the ROC, rather than its actual path.¹⁴ This supposition is exactly analogous to what I use in statistical comparisons reported earlier, where I assume that any differences between Quebec women and those in the ROC were constant through time. In Table 1, I refer to the output of this calculation as “simulated no-ANC total births.”

Several items in Table 1 merit attention. Notice that the total number of children born in Quebec in 1996 was almost exactly the same as in 1988, about 85,000. Taken alone, this near equality might be thought to justify Minister Léger’s statement that the program was a failure. However, this conclusion does not allow for the fact that the number of women of child-bearing age decreased during the period. For example, the number of women in their twenties dropped by more than 20 percent from 602,309 to 478,472. Thus, a smaller number of younger women in 1996 were having the same number of children as had the larger number of women in 1988. This falloff in the number of women of child-bearing age is what drives the decrease in the no-ANC births column of Table 1.

12 They study fertility using a *transition probability* approach, calculating the number of women “at risk” of having another child and estimating the probability that a birth occurs. They find a strong effect of the ANC on fertility during this period.

13 I construct the simulation by taking birth rates by parity (1, 2, 3 or more) and by age group (15–19, 20–24, 25–29, 30–34, 35–39, 40–44, and 45–49) separately for the ROC and Quebec. As a base, I use the average over 1986 through 1988 for each parity-age-group cell. (The results are not very sensitive to changes in the base — for example, using just 1988 as the base would give a cost of \$16,949 per additional child.) In each cell, I calculate the difference between the ROC and the Quebec fertility rates. I construct the simulated fertility path for Quebec without the ANC by subtracting the 1988 differences from the actual fertility rates observed in the ROC in 1989 through 1996. This exercise provides an estimated path for fertility in Quebec assuming that, without the ANC, fertility in Quebec would have followed the same trend as the ROC. I use the years 1989 through 1996 only, discarding the first and last years of the program (1988 and 1997) because of uncertainty surrounding its introduction and cancellation. All calculations are available from the author on request.

14 Since the counterfactual path is fundamentally unobservable, there is no “correct” assumption about the path that fertility would have taken in the absence of policy. In an earlier study (Milligan 2001), I find that the simple assumption used here produces smaller effects than more sophisticated projections that control for other factors. Therefore, this simulation may underestimate the number of births attributable to the policy.

Table 1: *The Number and Cost of Additional Births, Quebec, 1988–96*

	Actual Total Births (1)	Simulated No-ANC Total Births (2)	Additional Births (3)	Percentage Increase in Births (4)	Total Cost (5)	Cost per Additional Birth (6)
		(number)		(%)	(\$ millions)	(\$)
1988	85,484	85,484	0	—	52	—
1989	90,910	85,958	4,952	5.8	111	22,443
1990	97,425	86,897	10,529	12.1	151	14,362
1991	97,075	83,971	13,104	15.6	180	13,712
1992	95,974	82,430	13,544	16.4	197	14,579
1993	92,072	79,428	12,645	15.9	195	15,406
1994	90,286	77,747	12,540	16.1	196	15,611
1995	87,370	75,449	11,921	15.8	191	15,981
1996	85,311	71,476	13,835	19.4	186	13,441
1989–96	736,424	643,356	93,068	14.5	1,406	15,113

Note: Column 1 shows the actual number of children born in Quebec in each year. Column 2 displays the simulated number of births without the ANC, and column 3 the number of additional births, calculated as the difference between the actual and the simulated birth totals (column 1 minus column 2). Column 4 reports the number of new (additional) births as a percentage of the simulated no-ANC number of births. Columns 5 and 6 examine the financial implications of the program. The total cost is determined by the benefit rates paid in each year and the birth order of the children born. The cost per additional child is the total cost (column 5) divided by the estimated number of additional births (column 3). Small discrepancies in the results of mathematical calculations are the result of rounding errors.

Source: Author's calculations.

In brief, although the raw number of births was virtually unchanged during this period, each year saw more births than there would have been in the absence of the program.

How many more? The effectiveness of the program in achieving its pro-natalist goals can be evaluated by looking at the percentage increase in fertility over the simulated no-ANC path (Table 1, column 4). In total, over the eight years covered in the simulation, there were 93,068 children more than the 643,356 who would have been born in the absence of the program — a 14.5 percent increase.

What Did the Additional Children Cost?

Column 5 of Table 1 reports that the ANC cost about \$1.4 billion over the 1989–96 period. To most researchers, a 14.5 percent increase for only a few thousand dollars of benefits seems very large. For a pro-natalist policy, however, this response may not be strong enough to justify the public expenditure. A percentage increase of 14.5 implies that the program “created” only 14.5 of each 114.5 children born — the other 100 would have been born even in the absence of the program. In other words, the subsidy was “wasted” on the families who would have had children had there been no program.¹⁵ This expense

¹⁵ The funds were “wasted” in the sense that they did not work toward the program’s stated goal of influencing fertility decisions. However, to the extent that the benefits went more to poor mothers than to high-income mothers, they may have helped needy families with the extra costs associated with another child.

is quantified in column 6. Dividing the program's total cost by the number of additional children yields the cost per additional child. On average over the 1989–96 period, the simulations suggest that the Quebec government paid \$15,472 for each child who would not have been born in the absence of the program.¹⁶

Is \$15,000 per child a lot or a little? Because no one can quantify the total benefit brought by having extra children, this question is difficult to answer. Furthermore, a complete analysis might compare the effects of the ANC with alternative strategies, such as an increase in immigration levels. In the end, judgments on the policy should be made by Quebecers fully informed by the data on the costs and benefits.

Who Are the Additional Children?

Which families were responding to the incentives in the ANC program? Some preliminary indications are available. In an earlier study (Milligan 2001), I find that families' responsiveness to these incentives grew as family income rose. An extra \$50,000 of family income increased the size of the response by more than 50 percent.

Several explanations are consistent with this finding. Perhaps higher-income families knew more about the program than lower-income families. Alternatively, lower-income mothers may not have responded because they preferred spending more money on the children they already had, rather than increasing the size of their families. Higher-income mothers may be more willing to move to larger family sizes.¹⁷

Conclusions

The empirical evidence indicates that the ANC led women in Quebec to have more children than they would have had otherwise. I find that, between 1989 and 1996, fertility among Quebec women rose to close 86 percent of the Quebec-ROC fertility gap. The public cost of the policy, however, was in the order of \$15,000 per additional child.

This historical episode offers three clear lessons for policy. First, public policy can have strong incentive effects on individuals' behavior. Second, even if the reaction to a fiscal incentive is strong, the effective cost of a policy may be large if payments are also sent to individuals who would have behaved in the desired way even in the absence of the program. Finally, the distributional effect of an incentive policy may not be as intended; what matters is who reacts to it.

A pro-natalist tax policy may strike some people as an odious attempt at social engineering. However, government policies are rarely neutral: all tax and transfer policy choices have some effect on the decisions citizens make about, for example, how much to save and to work. The effects of policy on all these decisions can fundamentally

Even if the reaction to a fiscal incentive is strong, the effective cost of a policy may be large if payments are also sent to individuals who would have behaved in the desired way even in the absence of the program.

16 Recall that the simulation assumes that, without the ANC, fertility rates in Quebec would have followed the same trends as in the ROC. If one assumed instead an underlying upward trend in fertility among Quebec women relative to women in the rest of the country, the simulated number of additional children under the program would be smaller, and the cost per extra child would be even larger, as the same fiscal cost would be spread over fewer births.

17 This explanation draws on a prediction from a theoretical model by Becker and Tomes (1976), which posits that families make decisions about the quality (amount of spending per child) and the quantity of children. Becker and Tomes predict that high-income women may be more sensitive than low-income women to changes in the cost of children.

change the nature and form of society. In this way, all tax policy alters the path taken by society and is thus a form of “social engineering.” This conclusion attests to the importance of making effective tax policy choices. People clearly do respond to financial incentives, even in matters as deeply personal as fertility. All the more reason, then, to ensure that the incentives created by tax and transfer policy choices match Canadians’ social goals.

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