Population Studies, Vol. 60, No. 1, 2006, pp. 23–38

Religious differentials in marital fertility in The Hague (Netherlands) 1860–1909

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Previous studies of the marital fertility transition in Europe have found religious differentials. Using data collected from the population registers of The Hague, our aim in this study is to search for answers to the following questions: whether religious differentials result from socio-economic characteristics; to what extent religious ideology explains the behaviour of religious groups; which proximate determinants account for the religious differentials; and whether the Jews were forerunners in the marital fertility transition in Europe. The results provide some evidence of relatively low levels of parity-dependent fertility control among Jews before the transition and among Catholics during the transition. Religious ideology probably accounts for the low level of fertility control among Catholics. The ultimate reason for the relatively high marital fertility among Jews before the transition remains unclear. Our findings do not support the hypothesis that Jews were forerunners in the marital fertility transition.

Keywords: marital fertility; religious differentials; minority-group status; parity-dependent fertility control; population registers; discrete-time repeated-events history model

[Submitted December 2004; Final version accepted July 2005]

Introduction

The spread of fertility control differs from religion to religion. For instance, the decline in marital fertility among Catholics in countries including Germany and the Netherlands was delayed compared with that in other religious groups (Knodel 1974; van Poppel 1985), while Jews are thought to have led the rest of the population in achieving lower levels of reproduction in countries like Germany and Italy (Knodel 1974; Livi-Bacci 1986). As yet, much needs to be learned about the proximate and ultimate determinants of religious differentials in fertility. In this paper, these determinants are investigated in a Dutch setting, using birth-history data from the population registers of The Hague, which are available from 1850. Our questions are, first, whether religious differentials can be explained by socio-economic characteristics; second, to what extent religious values explain the behaviour of religious groups; third, which proximate determinants account for the religious differentials; and fourth, whether Jews were 'forerunners' in the fertility transition. Since religious differentials and their determinants may change over time, we examine the first three questions for two different periods—before and during the transition.

Religion and fertility

There are three kinds of hypotheses about the relationship of religion to fertility: the characteristics hypothesis, the religious-values hypothesis, and the minority-group-status hypothesis (Goldscheider 1971). The first type contends that religious differentials will disappear once the proper socio-economic and demographic variables are taken into account. 'Suppose that on average Catholics have both higher fertility and lower socio-economic status than Protestants. If Protestants and Catholics with the *same* socio-economic status did not differ in fertility, then the higher fertility of Catholics as a group would be presumed to result from the compositional effect of a higher proportion of Catholics than of Protestants having low socio-economic status' (Anderson 1986, p. 299). Schrover's (1997) study is a Dutch example of the characteristics hypothesis. She associates the relatively high fertility among Catholics in rural areas of the south

of the Netherlands in the second half of the nineteenth century with the contemporary reduction in women's tasks on farms. Petersen (1961, p. 223), discussing the results of the 1941 Indianapolis study, provides an additional example when he argues that 'the small family size of Jews derives from their concentration in cities, especially in those urban occupations that are always associated with low fertility'.

Religious ideology may influence fertility not only directly through proximate variables, such as the use of contraceptives or breastfeeding, but also indirectly by increasing the number of children that couples desire, or by teachings on the appropriate roles for men and women without specifying a particular proximate determinant (McQuillan 2004, p. 31). During the nineteenth century, the policy of the Catholic Church and other denominations was to say as little as possible in public about contraception, and, in private situations, where necessary, to reiterate the traditional condemnation by the Church (Campbell 1960, pp. 131–2). In the twentieth century, the Catholic Church placed more severe sanctions than the Protestant churches or Judaism on the use of contraception (Feldman 1968, pp. 104–105).

Marital fertility may also be influenced through religious attitudes to breastfeeding. In the Netherlands, the Catholic Church did not start a vigorous campaign against the use of birth control until after 1900 (Westhoff 1986, pp. 26–42; Röling 1987, pp. 135–41 and 218–25). Hence Meurkens (1989, p. 129) has argued that marital fertility among Catholics was high in the nineteenth century because of a decline in breastfeeding (see also Lesthaeghe 1983). In the second half of the nineteenth century, Catholic priests in the Netherlands started to oppose the baring of any part of the female body, in particular breasts, to prevent sexual stimulation of men. The Catholic politician P. J. M. Aalberse (1871–1948) explained that 'Catholics . . . do not breastfeed because of a misplaced sense of shame [when bearing their breasts] or, even worse, because of the tradition of binding young girls' breasts so they won't develop [making breastfeeding difficult] . . . This terrible habit is probably the result of prudishness which is wrongly equated with morality . . .' (translated from Aalberse 1917, p. 354).

Writing in the first half of the nineteenth century, the Polish Rabbi Abraham Zvi Hirsch Eisenstadt (1966) advised parents not to wean infants before the age of 2. Nineteenth-century observers in Amsterdam and Rotterdam reported that Jewish mothers breastfed their infants more than Catholics and Protestants (van Poppel 1992), but it is not clear whether this was for religious reasons. A local health commission in The Hague reported relatively small religious differentials in breastfeeding patterns in 1908. Forty per cent of Jewish mothers breastfed for more than 10 months, compared with 35–36 per cent among Protestants and Catholics (Gezondheidscommissie 1912).

A number of religions have elaborate rules about the timing and frequency of sexual intercourse. The concept of 'marital debt'—the obligation of spouses not to deny sexual gratification to their partner—may be one of the few elements of Catholic theology to have promoted coital frequency (Hull 1996, p. 12; McQuillan 2004, p. 29). Jewish marital law stipulates that a woman is entitled to a minimum coital frequency, depending on the husband's occupation, as part of her marital rights (Feldman 1968).

If differences in neither characteristics nor religious ideology explain religious differentials in marital fertility, there remains the minority-group-status hypothesis, which relates the fertility behaviour of a given group to the social context in which the group exists. Explanations of reproductive behaviour among Jews during the transition are often of this kind. For instance, Goldscheider (1967, p. 207) contends that Jews, as members of a minority group that is conscious of discrimination, feel insecure and believe they lack full acceptance in the non-Jewish world, and that their aspiration to social mobility and desire for acceptance in society, has tended to encourage small family size. While Goldscheider stresses the desire for *integration* as a decisive force, Knodel argues that it was rather *segregation* that favoured the adoption of practices of family limitation among Jews. He attributes (1974, pp. 140–1) the early fertility decline among German Jews to 'the close cultural and social ties between them which resulted in their being a more self-contained, closed cultural entity than Protestants or Catholics and provided a situation in which changing norms regarding family size and family limitation could spread rapidly and relatively independently of the rest of German society'.

Of course, it would be wrong to associate the minority-group-status hypothesis with Jews only. During the overall period described in the present study, Catholics in The Hague also constituted a minority, albeit a much larger one. This is likely to have affected their compliance with the requirements of Church authorities, and hence their reproductive behaviour.

Religious ideologies seem to play a pivotal role in some settings but not in others. McQuillan (2004, p. 32) argues that religious values are most likely to

matter when religious institutions have the means to communicate values to their members and to institute mechanisms to promote compliance and punish nonconformity. The Netherlands seems to have provided such a setting for Catholics. Dutch Catholics have held a minority position for several centuries. In their opposition to the Protestant majority, they developed strong religious institutions, and these dominated their group in the Netherlands to such an extent that the Church's moral objection to family planning could be maintained (van Poppel 1985, p. 368).

In the nineteenth century, religion deeply divided Dutch society. It played an important role in determining the choice between the three main types of school: public, Protestant, or Roman Catholic. Thus, by the age of 6, society was already split along religious lines. In Dutch, this phenomenon is known as *verzuiling* (the 'pillarization') of society. Typically, a Dutch child played with children of his or her own faith only. When a Dutch male grew up, his circle of friends would consist of people of the same faith and he would marry someone of that faith. He would join the party and trade union, and read newspapers and periodicals associated with his faith (van Poppel 1985, pp. 352–3).

Data and variables

Because of the unbalanced regional distribution of Catholics in the Netherlands, a national study of this group may confuse the effect of religion with that of region. We therefore decided to focus on a city in the western part of the country, where the numbers of Protestants, Catholics, and Jews were large enough for our purpose. Because, for practical reasons, our choice fell on The Hague, the results presented here relate mainly to the urban sector, though rural migrants may to some extent have mitigated the differences between urban and rural settings. Although the choice of The Hague may affect the *size* of any effect of religion, we do not expect this to affect its *direction*.

In the second half of the nineteenth century, The Hague evolved from a provincial capital and a quiet place to live into a big, modern city. In 1850, the city had about 72,000 inhabitants. After 1870, when prosperity increased, the population grew steadily, reaching 206,000 at the turn of the century. More than half of this growth was due to migration. The presence of the Royal Court, Parliament, and government offices attracted large numbers into the service sector. In 1850 this sector made up 42 per cent of the labour force. Another 34 per cent were employed in industry, mostly in the construction sector and in the clothing and shoe industries. By 1900 the service sector had declined to less than 37 per cent, while almost 36 per cent were employed in industry (Stokvis 1987, pp. 88 and 149).

In 1850 about 60 per cent of the population of The Hague was Dutch Reformed. After 1880 their numbers declined, reaching about 40 per cent in 1920. The percentage of Roman Catholics remained more or less stable at about 30 per cent for most of the period, while the percentage of Jews slowly declined from about 5 to 3 per cent in 1920. Before the twentieth century, few people in The Hague were unaffiliated to a particular religion.

It should be noted that the Dutch Reformed in The Hague, as elsewhere, included both fundamentalists and liberals, the former being much more outspoken in their opposition to neo-Malthusianism. At the end of the 1880s members of the Dutch Reformed congregation in the city received the right to vote for new clergymen. This led to the domination of more orthodox clergy, and after a while liberal clergy were no longer appointed in The Hague (Stokvis 1987).

At the restoration of the Catholic episcopal hierarchy in 1853, The Hague became a deanery in the diocese of Haarlem. Stations (congregations having neither a church nor a resident priest) were replaced by parishes with defined territories, and from then on the faithful were instructed to keep to their own local parish. This removal of choice is thought to have increased the hold of local priests over the faithful in their parishes (Voets 1981, p. 19). Between 1853 and 1900 the number of Catholic parishes and churches in The Hague doubled, enabling the faithful in new neighbourhoods to go to church. The growing Catholic self-confidence expressed itself in the neo-Gothic style of churches, the Maria cult, and the foundation of religious brotherhoods (Dumas 1983).

Most Jews lived in four neighbouring streets known as *De Buurt*—literally 'the neighbourhood'—and in a few streets nearby. Although this was not an exclusively Jewish neighbourhood (many non-Jews lived there) in the middle of the nineteenth century, there was still a certain degree of cultural isolation because of the Yiddish still spoken by many inhabitants. In the second half of the nineteenth century those who could afford it started to move out to streets around *De Buurt*. The Jewish community in The Hague had its own hospital, orphanage, and home for the aged. Towards the end of the century

complaints about the decline of religious commitment became more common (van Creveld 1989).

For the present study, marriage registration was used as a sampling frame. A degree of oversampling was necessary to ensure that a sufficient number of Jews were included in the study. The marriage registers do not contain information on religion. To identify Jewish couples, we first compiled a list of surnames common among Dutch Jews, drawing on four different sources: a list of names of Jewish families living in the Jewish quarter of The Hague in the years 1811–1942 (van Creveld 1989, pp. 214–22); an index of surnames of Jews marrying in the period 1811–52 (Veldhuijzen 1996); a list of surnames in the archives of the Sephardic Jewish community of The Hague; and the registers of rabbinical marriages in The Hague for the period 1873–1902. Because only a very few Jews were not registered members of the Jewish community in the nineteenth century, the registers of rabbinical marriages cover the vast majority of the growing secular Jewish population. Using the list of surnames, we searched the marriage registers for couples who married in The Hague during the years 1859–1902, and consulted the population registers of The Hague to verify whether the bride or groom or both were indeed Jewish. For all other religious groups, a random sample was drawn from the records of civil marriages contracted between 1859 and 1902. The sample fraction ranges from 4.6 per cent (1902) to 8.2 per cent (1885), and the initial number of cases was 3,966 couples. However, many couples who married in The Hague did not settle there after their marriage. Other couples simply could not be located in the population registers for technical reasons. Second marriages were excluded from the study, and a few more cases were lost because of data inconsistencies and missing values. The final sample, on which the data are based, comprised 2,145 women, giving 24,943 years of exposure. Note that there are women who contributed years to the analyses of both periods.

Next, socio-economic and demographic information on the couples was extracted from the population registers. Continuous population registers—bound documents with non-removable pages—were prescribed in the Netherlands by a royal decree of 22 December 1849, to record the population residing within each municipality. The returns from the census of 1849 were copied into the population register, and from then on all changes occurring in the population during the following decades were recorded there. For each individual, the following details appear in the record: date and place of birth, relation to the head of the household, sex, marital status, occupation, and religion. Births after 1909 are not included in the study.

For the town of Tilburg, Janssens (1994) checked the accuracy of the population register's recording of demographic events by comparing the registration of births there against the birth registers. At most 0.2 per cent of births were not entered in the population register, all such cases being children dying soon after birth. The omission of less than 1 per cent of births should not significantly affect the conclusions of the present paper.

Couples are divided into four religious groups according to the denomination of the husband. The Dutch Reformed constitute the largest group, with 924 couples. There are 494 Roman Catholic and 613 Jewish couples, the latter mostly *Ashkenazim*. The residual category (114 couples) consists of different groups of Calvinists, such as the Christelijk Gereformeerde Kerken and the Gereformeerde Kerken in Nederland, small liberal Protestant groups such as the Evangelisch Luthers Kerkgenootschap, the Remonstrantse Broederschap, and people without religion.

We used the first occupation listed in the population registers. Occupational categories are a far from perfect basis for a socio-economic stratification of the population. For example, in the early years of the population registers they do not indicate whether a person is an employer, self-employed, or an employee. In particular, occupations in the trade sector pose a problem: it is usually impossible to tell whether a person is a great merchant or just a street trader.

The study used a slightly adapted version of the socio-economic classification by occupational category designed by Giele and van Oenen (1976). This is based on the relationship of the individual to the means of production and on the ideas of contemporaries about the class structure. The categories are:

1 Upper class (employers in industry, professionals, higher civil servants, higher military personnel);
2 Petite bourgeoisie (shopkeepers, small entrepreneurs and merchants, self-employed artisans);
3 Lower white-collar (lower-level professionals and lower-level civil servants, foremen and supervisors of various kinds);
4 Gardeners and fishermen;
5 Skilled manual workers (craftsmen, skilled labourers, construction workers, service employees, lower-level military personnel);
6 Unskilled labourers;
7 Without occupation, and unknown.

The different religious groups have different socio-economic profiles. Jews are over-represented in the trade and retailing sector ('petite bourgeoisie') of The Hague, whereas Catholics and the Dutch Reformed are more likely than Jews to have working-class occupations (see Table 1). This does not mean that Jews were on average better off than others. Indeed many Jews in the trade and retailing sector were just street traders living in one of the poorest neighbourhoods of The Hague (van Creveld 1989). Almost all fishermen were Dutch Reformed, all living in the coastal village of Scheveningen, which belongs to the municipality of The Hague.

The following demographic variables are included in the study: age of the woman; marital duration; a dummy variable indicating the first year of marriage; age difference between the woman and her husband; infant mortality; the number of births, or crude parity; and the number of surviving children, or net parity. A set of dummy variables is used to model the effect of a woman's age. The dummy variable indicating the first year of marriage is added to take into account the fact that some women were exposed to sexual intercourse and may have conceived before marriage.

In the absence of parity-dependent marital fertility control, the age pattern of marital fertility closely follows a standard schedule, a fact which led Coale and Trussell (1974) to propose to use the deviation of the age pattern of marital fertility from such a schedule as a measure of parity-dependent fertility control. However, fertility control is a function not only of age but also of marital duration. For this reason, Page (1977) proposed a model of marital fertility incorporating both age and marital duration. Later van Bavel (2003) introduced parity into the model in order to determine whether the effect of marital duration on marital fertility is primarily attributable to parity-dependent fertility control or to declining coital frequency. The present study makes use of his method to uncover evidence for parity-dependent control. Van Bavel's model includes both net and crude parity. Net parity equals crude parity minus the number of children who died. Thus, after controlling for crude parity, the effect of net parity is exactly the opposite of the effect of the number of children who died. Although parity-dependent fertility control is a function of net rather than crude parity, the inclusion of crude parity is essential in order to control for fecundability and secondary sterility. There is a positive correlation between crude parity and fecundability, while there is a negative correlation between crude parity and secondary sterility. Fecundability and secondary sterility will also influence net parity, but less so than they do crude parity.

Crude parity is modelled as a count variable, and net parity by three dummy variables indicating two, three, and four or more children being alive in the previous year, one child or none being the reference category. The death of an infant to a breastfeeding mother would be expected to shorten the post-partum infecundable period. To control for this physiological effect, the study includes a variable indicating whether an infant death occurred in the previous year.

When family limitation is practised, the reproductive behaviour of couples will depend on net parity. However, net parity is also a function of past levels of breastfeeding, coital frequency, and contraceptive use, just as crude parity is. Hence, after controlling for crude parity and infant mortality, a *negative* correlation between net parity and subsequent fertility suggests the presence of family limitation in the broadest sense, including parity-dependent abstinence and reductions in coital frequency. In this study, crude and net parity are lagged by 1 year (see the next section, 'Statistical methods').

Because the individual's view of the ideal family usually encompasses preferences about both number

Table 1 Occupational distribution of male heads of household by religion, The Hague 1860–1909

Occupational group	Dutch Reformed	Catholics	Jews
Upper class	6.8	3.2	7.4
Petty bourgeoisie	17.0	24.5	57.8
Lower white collar	6.6	6.1	8.1
Horticulture and fishing	7.5	2.4	0.1
Skilled labourers	36.3	35.3	13.1
Unskilled labourers (reference category)	9.3	9.7	3.7
Without occupation and unknown	16.4	18.8	9.8
Total	100.0	100.0	100.0
Number of cases	1,114	621	727

Source: Population registers of The Hague.

of children and their distribution by sex, this latter preference may affect the reproductive behaviour of couples when family limitation is practised. Pollard and Morgan (2002) have shown that among American cohorts born between 1915 and 1954 a child of each sex was often required before parents stopped childbearing. For the present study, we constructed two variables, one indicating that the only children alive in the previous year were boys and the other that girls were the only children alive. Both same-sex variables produced similar results. To prevent multicollinearity with net parity we excluded the 'only boys' variable from the model.

The study comprises women who married in The Hague only. Thus, all the women went through at least a partial process of socialization in an urban area before marriage. It is not possible to differentiate between migrants and locally born mothers, which is a shortcoming in our analysis since it has been shown that migrant status is related to fertility control in urban settings (Alter 1988, p. 193). However, if the omission of this variable does not affect the coefficients of the other variables in the analysis, it should not affect our conclusions.

Statistical methods

A discrete-time multi-level hazard model is used to assess the effects of the independent variables on the probability of giving birth (Barber et al. 2000). On the first level we have years and on the second women. It is now an accepted procedure to estimate discrete-time hazard models using logistic regression (Efron 1988). A logistic regression can easily accommodate two common features of event histories: censored data and time-varying variables such as crude and net parity (Allison 1982).

Event-history models were initially developed in the health sciences, where the canonical study is one of mortality. By contrast, the nature of fertility is that births are repeatable events. Because the focus of the present study is not any specific interval but rather fertility levels in general, intervals were pooled, turning the model into a repeated-events duration model (Box-Steffensmeier and Zorn 2002). The use of logistic regression to estimate the repeated-events history model effectively turns this analysis into a binary time-series cross-section analysis, in which binary time series for women are pooled. Researchers typically analyse time-series cross-section data with a binary dependent variable assuming temporal independence. However, observations in a time series are likely to be temporally dependent, and ignoring this may lead to misleading results (Beck et al. 1998). The simple solution used here is to add a lagged dependent variable. A random effect was added to the model in order to control for unobserved heterogeneity between women (Amemiya 1985, pp. 348–52; Yamaguchi 1986). MIXNO, a computer program for mixed-effects logistic regression, was used to estimate the coefficients (Hedeker 1999).

Since we do not censor intervals (after 5 years, for example) but follow all married women, including infertile ones, until the end of their marriages, or until age 50, or, depending on the period, until 1880 or 1910—whichever comes first—last intervals can be quite long. Moreover, unlike deaths, births cannot occur every month. Hence, we opted for annual rather than monthly intervals. The model, therefore, assumes that the hazard for a birth is constant within annual intervals, but is otherwise unconstrained. There is some chance that a woman will have two births in a calendar year. However, we found that less than 0.5 per cent of second and higher-order births occurred during the same calendar year as the previous birth. The dependent variable in the model is the log odds of a woman giving birth in a specific calendar year.

Results

Using Coale's marital fertility index as a criterion, it is clear that a marital fertility transition was well on its way in The Hague in the 1880s (see Figure 1). Allowing for some inaccuracy, we will refer to the periods before and after 1880 as 'before the transition' and 'during the transition', respectively.

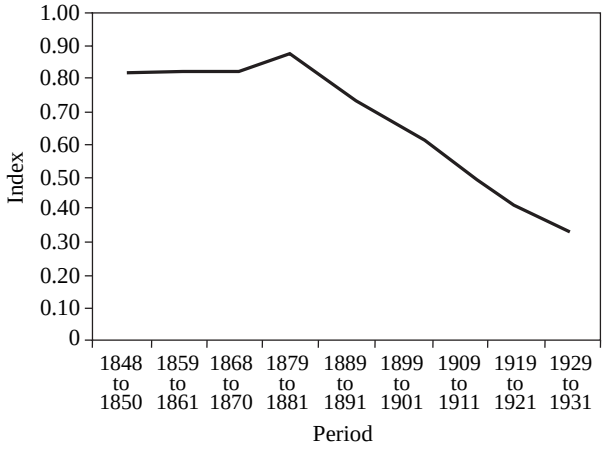

Figure 1 Coale's marital fertility index I_g, The Hague 1848–1931
Source: Van Poppel (1984, p. 75).

Table 2 Age-specific marital fertility rates and total marital fertility by religion and period, The Hague 1860–1909

	1860–79			1880–1909		
Age group	Dutch Reformed	Catholics	Jews	Dutch Reformed	Catholics	Jews
20–24	0.524	0.547	0.557	0.502	0.507	0.488
25–29	0.455	0.462	0.525	0.423	0.471	0.394
30–34	0.487	0.361	0.442	0.302	0.355	0.314
35–39	0.315	0.338	0.391	0.210	0.261	0.272
40–44	0.161	0.200	0.248	0.137	0.154	0.182
45–49	–	–	–	0.019	0.026	0.021
Total marital fertility	9.5	9.5	10.8	8.0	8.9	8.3
Years of exposure	1,477	775	1,562	9,912	5,262	4,942

Source: As for Table 1.

Table 2 presents age-specific marital fertility by religion before and during the transition in The Hague. Before 1880 total marital fertility was highest among Jews. In the second period, marital fertility was highest among Catholics. An analysis of the shape of the marital fertility function by age may indicate whether parity-dependent fertility control accounts for any of these observations. The age pattern becomes more apparent when the value for the 20–24 age group in each schedule is taken as 100, as is done in Figure 2(a) and (b). For comparison, a population with 'natural fertility'—the Hutterites—has been added to the figures. In the pre-transition period, the age pattern of Jewish fertility shows a close resemblance to that of the Hutterites, suggesting a very low level of parity-dependent fertility control. Like that of the Hutterites, Jewish fertility shows a pattern of a slow decline up to the age of 35–39, falling rapidly thereafter. This pattern is less clear among the other two groups, who diverge slightly from the Hutterites, but not enough to show with any certainty whether family planning was being practised. Marital fertility tends to be higher among women who have recently married, because the first birth interval does not include a period of post-partum non-susceptibility. This may explain part of the deviation from the Hutterite pattern in Figure 2(a) and (b). In the first period, when Jewish women married earlier than others on average, such deviations are more likely among Catholics and the Dutch Reformed, while in the second period, when Jewish women married later than others, deviations are more likely to occur among Jews (see Table 3). For this and other reasons

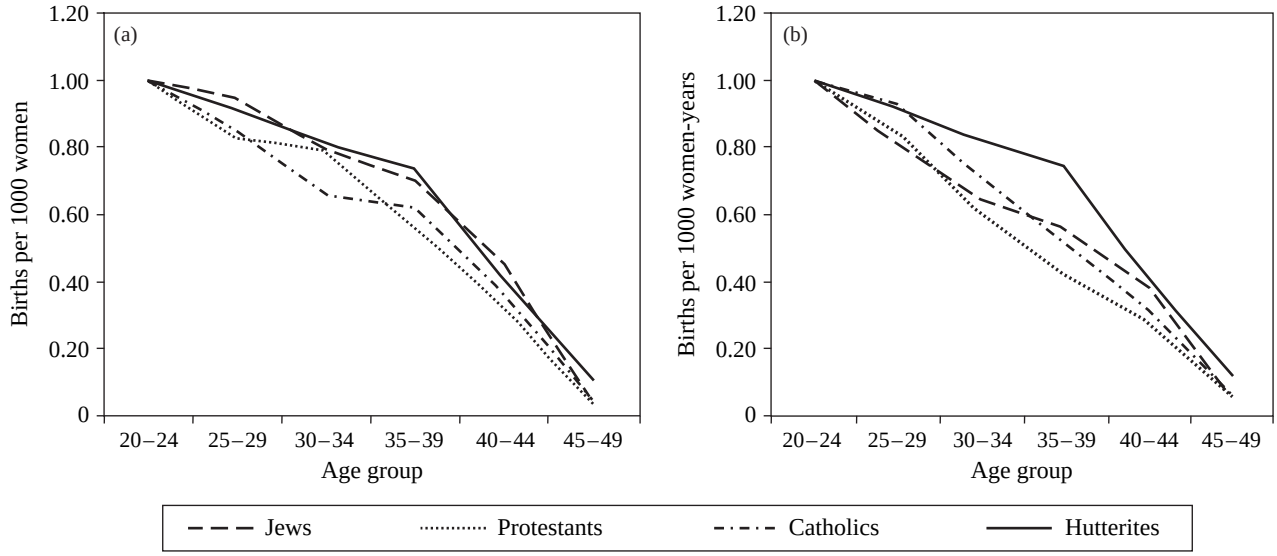

Figure 2(a) Indexed age-specific marital fertility rates by religion, The Hague 1860–1879
Note: There are not enough cases in the last age group to estimate marital fertility rates; instead estimates for 1880–1909 are used
Source: Computations based on Table 2.
(b) Indexed age-specific marital fertility rates by religion, The Hague 1880–1909
Source: As for Figure 2(a).

Table 3 Mean age at first marriage of women by religion and period, and age at last birth by religion, The Hague 1860–1902

	Age at first marriage				Age at last birth	
	1860–79		1880–1902			
Religion	Mean	*n*	Mean	*n*	Mean	*n*
Dutch Reformed	26.0	254	25.1	670	38.3	195
Roman Catholic	26.3	136	25.3	358	39.7	90
Jewish	25.5	212	25.7	401	40.9	69
Others	27.0	26	25.6	88	37.5	25

Source: As for Table 1.

the graphical method may not be sensitive enough to measure low levels of parity-dependent fertility control. Below, we will use regression analysis to show that the Dutch Reformed already practised this type of fertility control before the transition.

When couples can use some method of family limitation, they make efforts to reduce or cease further childbearing and thus lower fertility when they reach their desired family size. For this reason, fertility falls more rapidly as age, and thus parity, increases (Wilson 1984, p. 229). Figure 2(b) shows that marital fertility among the Dutch Reformed declined at a similar speed both before and after the age of 35–39. This is clear evidence of the practise of family limitation after 1880 among the Dutch Reformed. Figure 2(b) suggests that family limitation was also practised among Catholics and Jews but may have been less widespread among them.

Table 4 presents descriptive statistics by period for the variables used in the discrete-time event-history analysis. Note that many women who married in the first period continue to contribute years of exposure to the second. This and its longer duration explain the second period's relatively high mean values of crude and net parity and marital duration.

Table 5 presents three models of a discrete-time event-history analysis of births before the transition. The first model shows that there is no significant difference between Catholics and Protestants during the pre-transition period, while the odds of a birth among Jews are significantly higher than among Protestants. The effect of being Jewish does not change, and remains significant in the second model after occupational categories are added. Upper-class and lower-white-collar families have lower fertility than the families of unskilled labourers. This finding is consistent with the theory that high fertility is a strategy adopted by working-class families to cope with life-cycle poverty (see Schellekens 1993). The third model adds infant mortality and crude and net parity. All three have a significant effect. Note that the inclusion of these variables reduces heterogeneity, as well as the effects of the occupational categories. Yet the effect of being Jewish does not diminish.

Table 6 shows evidence for parity-dependent fertility control among the Dutch Reformed before 1880. In a one-sided test, having two children in the previous year has an effect that is significant at the 5-per-cent level. No evidence of parity-dependent fertility control among Catholics or Jews is revealed. If anything may be inferred from the shape of the marital fertility function in Figure 2(a), it may be that the relatively high fertility of Jews before the transition was due to a low level of parity-dependent fertility control. But we cannot exclude other explanations, except for one—late marriage among Jews that may be associated with a slower decline in coital frequency or level of contraceptive use as women age. First, age at marriage is controlled for indirectly by including marital duration and age. Second, Jewish women married relatively early in the pre-transition period compared with non-Jews (see Table 3).

In any case, the analysis does not provide any evidence of Jews having a higher level of parity-dependent fertility control before the transition than other groups. Without such evidence, the hypothesis that Jews were forerunners in the transition cannot be supported in the case of nineteenth-century The Hague.

The first model in Table 7 shows that there is no significant difference between Protestants and Jews during the transition, while the odds of a birth among Catholics are significantly higher than among Protestants. The effect of being Catholic does not change, and remains significant in the second model after the inclusion of dummy variables for the occupational categories. Again, upper-class and lower-white-collar families have lower fertility than those of unskilled labourers. Differences in infant mortality, crude and net parity, and sex composition

Table 4 Descriptive statistics for all variables used in a study of religious differentials in marital fertility in The Hague 1860–1909, by period

Variable	1860–79		1880–1909	
	Mean[1]	SD	Mean[1]	SD
Birth	0.377	0.485	0.277	0.447
Religion				
Dutch Reformed (ref.)	0.388	–	0.471	–
Roman Catholic	0.200	0.400	0.249	0.433
Jewish	0.384	0.486	0.236	0.425
Others	0.028	0.165	0.044	0.205
Demographic variables				
Age of woman:				
<25	0.160	–	0.099	–
25–29	0.313	0.464	0.222	0.416
30–34	0.267	0.443	0.249	0.433
35–39	0.158	0.365	0.202	0.402
40–44	0.102	0.303	0.142	0.349
45+	–	–	0.086	0.280
Marital duration	5.105	4.519	8.842	6.463
Age difference	1.557	4.480	1.444	4.092
First year of marriage	0.145	0.352	0.068	0.252
Birth in $t-1$	0.305	0.460	0.260	0.439
Infant death in $t-1$	0.048	0.214	0.035	0.185
Crude parity in $t-1$	2.059	2.134	3.181	2.700
Net parity in $t-1$:				
0–1	0.572	–	0.367	–
2	0.184	0.388	0.206	0.405
3	0.119	0.324	0.144	0.351
4+	0.125	0.331	0.283	0.450
Daughters only in $t-1$	–	–	0.330	0.470
Occupational group				
Upper class	0.110	0.313	0.064	0.245
Petite bourgeoisie	0.337	0.473	0.298	0.457
Lower white collar	0.095	0.293	0.065	0.247
Gardeners and fishermen	0.030	0.170	0.057	0.232
Skilled manual workers	0.334	0.472	0.348	0.476
Unskilled labourers (reference category)	0.059	–	0.081	–
Without occupation and unknown	0.035	0.185	0.087	0.282
Number of women	584		1,778	
Woman-years	4,584		22,645	

[1]Means of woman-years; the averages for the two periods are not comparable owing to differences in marital duration.
Source: As for Table 1.

account for some of the difference between Catholics and Protestants, because the effect of being Catholic is smaller in the third model. The decline in this effect is mostly due to the inclusion of net parity and sex composition rather than infant mortality (results not shown). Part of the effect of being Catholic seems therefore to be due to differences in parity-specific fertility control. Note that about half of the heterogeneity is explained by infant mortality and crude and net parity.

While differences in socio-economic characteristics do not seem to account for much of the effect of religion in either period, there may be religious differentials in the coefficients of occupational categories. Hence, the religious groups are analysed separately. Table 8 presents three models of discrete-time event-history analyses of births for each of the three major religious groups during the transition. The effects of the occupational categories vary among religious groups, with no significant effect among Catholics. Differences among the occupational categories in this period are thought to be due to differences in fertility control (Schellekens 1993). Thus, the absence of any significant effect among Catholics suggests a low level of fertility control during the transition (see also Figure 2(b)), as well

Table 5 Discrete-time event-history analysis of births, The Hague 1860–79

Variable	Model 1		Model 2		Model 3	
	e^b	*p*-value	e^b	*p*-value	e^b	*p*-value
Religion						
Dutch Reformed	1.000	–	1.000	–	1.000	–
Roman Catholic	0.929	0.568	0.878	0.322	0.937	0.525
Jewish	1.262	0.031	1.256	0.055	1.238	0.020
Others	0.864	0.607	0.943	0.822	1.139	0.517
Demographic variables						
Age of woman:						
<25	1.000	–	1.000	–	1.000	–
25–29	0.852	0.212	0.868	0.271	0.896	0.366
30–34	0.792	0.133	0.835	0.246	0.855	0.253
35–39	0.669	0.035	0.722	0.091	0.724	0.048
40+	0.226	0.000	0.247	0.000	0.266	0.000
Marital duration	0.922	0.000	0.918	0.000	0.795	0.000
Age difference	1.000	0.968	1.005	0.688	0.999	0.911
First year of marriage	0.104	0.000	0.104	0.000	0.121	0.000
Birth in $t-1$	0.244	0.000	0.243	0.000	0.204	0.000
Infant death in $t-1$					3.940	0.000
Crude parity in $t-1$					1.433	0.000
Net parity in $t-1$:						
0–1					1.000	–
2					0.892	0.276
3					0.918	0.586
4+					1.082	0.692
Occupational group						
Upper class			0.518	0.005	0.625	0.013
Petite bourgeoisie			0.896	0.620	0.943	0.731
Lower white collar			0.552	0.014	0.665	0.030
Gardeners and fishermen			0.702	0.302	0.760	0.287
Skilled manual workers			0.877	0.546	0.940	0.712
Unskilled labourers			1.000	–	1.000	–
Without occupation and unknown			0.844	0.624	0.852	0.555
Intercept	2.260	0.000	2.786	0.000	2.450	0.000
SD random effect	0.655	0.000	0.630	0.000	0.093	0.404
Number of births	1,730		1,730		1,730	
Woman-years	4,584		4,584		4,584	
−2 Log likelihood						
Initial	6,076.337		6,076.337		6,076.337	
Final	5,407.976		5,387.788		5,260.277	

Source: As for Table 1.

as a strong religious influence touching all parts of the community. The strongest effects are seen among Jews. This could be a result of relatively large social inequalities and not necessarily a higher level of fertility control. However, caution is necessary when comparing logistic regression coefficients across groups. Differences in the degree of residual variation across groups can produce apparent differences in coefficients that are not indicative of true differences in causal effects (Allison 1999).

Those among the Dutch Reformed and Catholics who use parity-dependent control seem to do so usually after having had two children, while Jews seem to do so after reaching a net parity of either two or three. Note the relatively high likelihood of births among Dutch Reformed families with four or more children; we suspect that most of these are fundamentalist families. The effect of sex composition is significant only among the Dutch Reformed.

Conclusion and discussion

Coale's marital fertility index cannot be used for reliable dating of the early stages of a marital fertility transition (Guinnane et al. 1994). The

Table 6 Discrete-time event-history analysis of births by religion, The Hague 1860–79

Variable	Roman Catholic		Dutch Reformed		Jewish	
	e^b	p-value	e^b	p-value	e^b	p-value
Demographic variables						
Age of woman:						
<25	1.000	–	1.000	–	1.000	–
25–29	0.703	0.128	0.859	0.367	1.045	0.810
30–34	0.509	0.012	1.083	0.683	0.887	0.560
35–39	0.542	0.063	0.678	0.105	0.866	0.576
40+	0.257	0.005	0.275	0.000	0.280	0.000
Marital duration	0.878	0.001	0.786	0.000	0.737	0.000
Age difference	0.975	0.199	1.002	0.903	0.997	0.819
First year of marriage	0.141	0.000	0.172	0.000	0.055	0.000
Birth in $t-1$	0.297	0.000	0.259	0.000	0.132	0.000
Infant death in $t-1$	3.941	0.000	3.007	0.000	5.314	0.000
Crude parity in $t-1$	1.212	0.062	1.443	0.000	1.624	0.000
Net parity in $t-1$:						
0–1	1.000	–	1.000	–	1.000	–
2	1.029	0.908	0.740	0.083	0.948	0.770
3	1.043	0.910	0.759	0.271	0.956	0.848
4+	0.988	0.983	0.959	0.897	1.098	0.770
Occupational group						
Upper class	0.369	0.085	0.722	0.175	0.456	0.013
Petit bourgeoisie	0.757	0.547	1.045	0.835	0.758	0.315
Lower white collar	0.593	0.338	0.785	0.332	0.508	0.033
Gardeners and fishermen	0.621	0.417	0.829	0.510	–	–
Skilled manual workers	0.728	0.476	1.058	0.771	0.756	0.357
Unskilled labourers	1.000	–	1.000	–	1.000	–
Without occupation and unknown	0.892	0.845	0.929	0.826	0.530	0.145
Intercept	2.931	0.025	2.127	0.001	4.698	0.000
Number of births	328		651		708	
Woman-years	919		1,777		1,759	
−2 Log likelihood						
Initial	1,197.676		2,334.918		2,371.177	
Final	1,071.727		2,056.261		1,932.929	

Note: The random-effect variance cannot be reliably estimated as being different from zero.
Source: As for Table 1.

regression analyses presented here provide additional evidence for this, since some degree of parity-dependent fertility control can be seen before 1880 among the largest of the three major religious groups in The Hague. Although our characterization of the periods before and after 1880 as, respectively, 'before the transition' and 'during the transition' is not entirely accurate, we have kept 1880 as a dividing point, because religious differentials in marital fertility in The Hague show a divide around this time.

There are no significant differences between Catholics and Protestants for the period before the transition. Marital fertility for these two groups only started to diverge in the 1880s, Catholics lagging behind other religious groups. After controlling for occupational categories, the coefficient of being Catholic remains almost unaffected. This lends support to the argument that the characteristics hypothesis does not explain the relatively high fertility of Catholics. Perhaps there are socio-economic variables not included in our analysis that are not correlated at all with the occupational-category variables and account for some of the differentials. However, if this is not the case, then two possible explanations remain: the religious-values hypothesis and the minority-group-status hypothesis. The present analysis does not enable us to differentiate between them. Although the low level of parity-specific fertility control among Catholics during this period seems at least partly to explain their relatively high marital fertility, the study does not enable us to test Meurkens' breastfeeding hypothesis. However, judging by the 1908 report of the local

Table 7 Discrete-time event-history analysis of births, The Hague 1880–1909

Variable	Model 1		Model 2		Model 3	
	e^b	p-value	e^b	p-value	e^b	p-value
Religion						
Dutch Reformed	1.000	–	1.000	–	1.000	–
Roman Catholic	1.276	0.001	1.292	0.000	1.176	0.001
Jewish	1.026	0.718	1.097	0.231	1.069	0.215
Others	0.807	0.185	0.876	0.406	0.912	0.407
Demographic variables						
Age of woman:						
<25	1.000	–	1.000	–	1.000	–
25–29	0.863	0.054	0.880	0.093	0.918	0.220
30–34	0.612	0.000	0.636	0.000	0.690	0.000
35–39	0.495	0.000	0.525	0.000	0.578	0.000
40–44	0.329	0.000	0.354	0.000	0.405	0.000
45+	0.044	0.000	0.048	0.000	0.070	0.000
Marital duration	0.889	0.000	0.886	0.000	0.789	0.000
Age difference	0.967	0.000	0.973	0.001	0.979	0.000
First year of marriage	0.112	0.000	0.112	0.000	0.127	0.000
Birth in $t-1$	0.262	0.000	0.262	0.000	0.249	0.000
Infant death in $t-1$					2.608	0.000
Crude parity in $t-1$					1.428	0.000
Net parity in $t-1$:						
0–1					1.000	–
2					0.743	0.000
3					0.912	0.174
4+					1.079	0.389
Daughters only in $t-1$					1.259	0.000
Occupational group						
Upper class			0.571	0.001	0.724	0.006
Petite bourgeoisie			0.798	0.063	0.872	0.114
Lower white collar			0.639	0.004	0.790	0.033
Gardeners and fishing			1.227	0.263	1.137	0.304
Skilled manual workers			0.866	0.225	0.899	0.210
Unskilled labourers			1.000	–	1.000	–
Without occupation and unknown			0.668	0.006	0.768	0.009
Intercept	2.359	0.000	2.782	0.000	2.027	0.000
SD random effect	0.927	0.000	0.913	0.000	0.420	0.000
Number of births	6,268		6,268		6,268	
Woman-years	22,645		22,645		22,645	
−2 Log likelihood						
Initial	26,716.563		26,716.563		26,716.563	
Final	22,830.025		22,797.334		22,275.705	

Source: As for Table 1.

health commission (Gezondheidscommissie 1912), low levels of breastfeeding are a less likely explanation of the relatively high level of marital fertility among Catholics in The Hague.

If the present results may be taken at face value, The Hague's Jews had above-average marital fertility before the transition. As far as we can tell, this was not due to their occupational characteristics, but our analysis is inconclusive about the proximate reason. A graphical analysis of the shape of the marital fertility function suggests a low level of parity-dependent fertility control, as do our regression results. However, differences in parity-dependent fertility control are unlikely to have been large before 1880. This leaves low levels of non-parity-specific fertility control (spacing) or breastfeeding or both as the most likely proximate explanations. The 1908 health commission's report indicated relatively small religious differentials in breastfeeding patterns (Gezondheidscommissie 1912). Breastfeeding patterns, however, probably changed during the transition, and religious differentials may therefore have

Table 8 Discrete-time event-history analysis of births by religion, The Hague 1880–1909

Variable	Roman Catholic		Dutch Reformed		Jewish	
	e^b	p-value	e^b	p-value	e^b	p-value
Demographic variables						
Age of woman:						
<25	1.000	–	1.000	–	1.000	–
25–29	1.040	0.743	0.830	0.036	0.943	0.625
30–34	0.743	0.025	0.603	0.000	0.850	0.226
35–39	0.612	0.002	0.498	0.000	0.829	0.236
40–44	0.405	0.000	0.416	0.000	0.546	0.002
45+	0.094	0.000	0.077	0.000	0.073	0.000
Marital duration	0.779	0.000	0.777	0.000	0.760	0.000
Age difference	0.993	0.408	0.966	0.000	0.991	0.335
First year of marriage	0.145	0.000	0.145	0.000	0.149	0.000
Birth in $t-1$	0.281	0.000	0.253	0.000	0.256	0.000
Infant death in $t-1$	2.553	0.000	2.790	0.000	2.580	0.000
Crude parity in $t-1$	1.489	0.000	1.469	0.000	1.606	0.000
Net parity in $t-1$:						
0–1	1.000	–	1.000	–	1.000	–
2	0.788	0.024	0.776	0.002	0.643	0.000
3	0.878	0.311	1.060	0.563	0.789	0.085
4+	0.979	0.900	1.430	0.006	0.926	0.683
Daughters only in $t-1$	1.016	0.673	1.229	0.002	0.973	0.532
Occupational group						
Upper class	1.014	0.951	0.856	0.224	0.491	0.000
Petite bourgeoisie	1.046	0.705	0.870	0.162	0.674	0.011
Lower white collar	0.953	0.800	0.698	0.006	0.695	0.057
Gardeners and fishermen	1.287	0.234	1.096	0.395	–	–
Skilled manual workers	1.148	0.218	0.858	0.085	0.600	0.003
Unskilled labourers	1.000	–	1.000	–	1.000	–
Without occupation and unknown	0.983	0.903	0.785	0.035	0.607	0.045
Intercept	1.862	0.000	2.218	0.000	2.719	0.000
Number of births	1,685		2,823		1,519	
Woman-years	5,642		10,669		5,342	
−2 Log likelihood						
Initial	6,880.065		12,329.351		6,378.512	
Final	5,731.261		10,159.953		5,463.959	

Note: The random-effect variance cannot be reliably estimated as being different from zero.
Source: As for Table 1.

been larger before 1880. To what extent the relatively high fertility of Jews before the transition was due to their being a minority group we cannot tell. In any case, the absence of evidence of a relatively high level of parity-dependent fertility control means that the Jews in The Hague in the nineteenth century are unlikely to have been 'forerunners' in the marital fertility transition.

Before and during the transition, Jewish infant and child mortality in Europe as well as The Hague was lower than that of most other religious groups (van Poppel et al. 2002). Demographic transition theory would predict an early fertility decline among Jews in such a case, all else being equal. This is indeed what several authors claim happened. Livi-Bacci (1986) describes Jews as forerunners in the fertility decline in Italy. An early fertility decline has also been ascribed to German Jews (Knodel 1974). However, Derosas (2003, p. 114) finds no evidence of an early fertility decline among Venetian Jews. Furthermore, one of the few German family-reconstitution studies to compare Jews with other religious groups does not fit this characterization. For couples who married before 1830, the marital fertility of Protestants in the village of Nonnenweier already shows a large deviation from the Hutterite age pattern, while the first signs of family planning among local Jews only become visible among couples who married in the 1840s (Goldstein 1981, p. 132, Table 8). The results shown in the present study raise further doubts about the special characteristics of Jews during the marital fertility

transition. We did not find any evidence of higher levels of parity-dependent fertility control among Jews than among the rest of the population before or during the transition. In some places Jews may have been forerunners, but this was not a general European phenomenon.

Previous research assembled data on forerunners in the hope that this would increase our understanding of the complex transition of the populations of Western Europe from high to low marital fertility (Livi-Bacci 1986, p. 183). However, when religious groups such as Jews are forerunners in one place but not in another, religion is unlikely to contribute much to our understanding of the origins of fertility declines. Instead, it is more likely to explain leads and lags in the speed of these declines (Lesthaeghe and Wilson 1986).

The pace of fertility decline is a relatively unexplored topic. 'The classic statements about the determinants of fertility decline are addressed much more to the question of *why* fertility declines than to *how rapidly* it declines' (Casterline 2001, p. 18). Religion can be a major determinant of the pace of fertility declines, as the results of this and previous papers suggest. Whether a particular religion has any influence depends not only on its values, but also on the level of commitment of its members. Hence, future research should try to estimate the pace of secularization by religion and relate this to the pace of fertility decline.

Notes

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2 An earlier version of this paper was presented at the Annual Meeting of the Social Science History Association, November 2003. The authors thank Zvi Eisenbach, Barbara Okun, and three anonymous referees for their helpful comments. The research for this paper was supported by a grant from the Israel Science Foundation, administered by the Israel Academy of Sciences and Humanities, for a research project entitled 'Explaining religious differences during the demographic transition in Holland: how different were the Jews and why?' The data on which this research is based were collected for a research project entitled 'Religion and child mortality in Holland 1860–1920'. Financial assistance from the Wellcome Trust is gratefully acknowledged.

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