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Childhood Family Correlates of Heterosexual and Homosexual Marriages: A National Cohort Study of Two Million Danes

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Abstract Children who experience parental divorce are less likely to marry heterosexually than those growing up in intact families; however, little is known about other childhood factors affecting marital choices. We studied childhood correlates of first marriages (heterosexual since 1970, homosexual since 1989) in a national cohort of 2 million 18–49 year-old Danes. In multivariate analyses, persons born in the capital area were significantly less likely to marry heterosexually, but more likely to marry homosexually, than their rural-born peers. Heterosexual marriage was significantly linked to having young parents, small age differences between parents, stable parental relationships, large sibships, and late birth order. For men, homosexual marriage was associated with having older mothers, divorced parents, absent fathers, and being the youngest child. For women, maternal death during adolescence and being the only or youngest child or the only girl in the family increased the likelihood of homosexual marriage. Our study provides population-based, prospective evidence that childhood family experiences are important determinants of heterosexual and homosexual marriage decisions in adulthood.

Keywords Heterosexuality · Homosexuality · Marriage · Cohort studies · Childhood · Denmark

Introduction

Most people will engage in a formalized, long-term union with another person, usually marriage with a member of the opposite sex. However, patterns are becoming more diverse. In recent years, non-marital cohabitation has become socially more accepted and, still more recently, in some developed countries marriage is now permitted between members of the same sex. Despite a number of studies on the subject, childhood factors that may influence heterosexual marriage decisions have only been incompletely characterized and, because same-sex marriage is not a widespread option around the world, no previous study has examined whether childhood family factors may influence the likelihood of homosexual marriage in adulthood.

It is well established that the decision to formalize an intimate heterosexual relationship in marriage depends importantly on the parental model experienced during childhood and adolescence. Studies have consistently shown that offspring of intact parental marriages have more positive attitudes toward marriage and more often choose this option than do offspring of divorce (Berrington & Diamond, 2000; Wolfinger, 2003; Teachman, 2003). In contrast, data to evaluate the possible impact of siblings on marriage decisions in adulthood are scarce. The few published associations between the number of siblings and the ordinal position in a sibship on one side and heterosexual marriage propensities on the other have generally been weak (Murdoch, 1966; Prothro, 1968; Teachman, 2003). Until now, no published data exist to judge whether parent or sibling factors influence homosexual marriage decisions in adulthood. We used favorable opportunities in Denmark (Frank, 2000) to perform a nation-wide cohort study of the influence of a variety of childhood family structure variables on subsequent marriage patterns in adulthood. Denmark was the first country to legalize same-sex marriage in 1989 (Anonymous, 1989), so we studied early correlates of both heterosexual and homosexual marriages.

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Method

Study cohort

The Civil Registration System (CRS), established in 1968, is the core administrative register in Denmark containing continually updated electronic records of demographic information in the ethnically homogeneous, predominantly Caucasian population of 5.3 million persons (Danish Ministry of Interior Affairs and Health, 2005). Information in the CRS includes data on vital status, links to parents and offspring, birth place, changes of address, and changes in marital status. All Danish citizens who were alive on April 1, 1968, and persons born later, are covered by the CRS with all information linked to the individual by means of a unique 10-digit personal identifier encoding the person's sex and date of birth.

We first identified 2,000,355 persons born in Denmark between 1952 and 1983 by Danish born mothers. This birth year restriction was applied because only few persons born before 1952 have a link to their mother in the CRS, and those born after 1983 did not reach age 18 years, the minimum legal age for entry in heterosexual or homosexual marriage, by the end of the study period on January 1, 2002. The study cohort consisted of 1,040,171 men and 930,433 women who were alive and residing in Denmark on their 18th birthday. For the large majority (97.1%) of cohort members, the CRS also provided a link to the father.

We studied men and women separately, and heterosexual and homosexual marriages were considered as independent outcomes. People who had been a partner in both types of marriage contributed outcomes in both analyses. Since persons may engage in more than one of each type of marriage the outcomes of interest were first heterosexual marriage and first homosexual marriage.

Marriage incidence rates

In the cohort, 429,181 men and 453,121 women entered their first heterosexual marriage during 21.3 million unmarried person-years of follow-up in the age interval 18–49 years between 1970 and 2001. Median age at first heterosexual marriage was 28.6 years for men and 26.5 years for women. Overall, 1,890 men and 1,573 women in the cohort married a partner of their own sex during 13.7 million unmarried person-years between 1989 and 2001. Median age at first homosexual marriage was 32.6 years for both men and women.

Following exclusion of 1,016 persons (21 men and 995 women) who were granted special permission to marry before age 18 years, we calculated annual incidence rates of first heterosexual marriage in 5-year age strata (18–24 to 45–49 years) for the period 1970–2001. Specifically, stratum-specific numbers of persons entering first heterosexual marriage were divided by corresponding stratum-specific person-years at risk. For the denominator, we counted unmarried person-years from each cohort member's 18th birthday and until the date of first heterosexual marriage, 50th birthday, death, or January 1, 2002, whichever came first. Since a person can be a spouse in only one type of marriage at a time, we censored periods prior to first heterosexual marriage when cohort members were homosexually married (17,471 person-years). In a similar manner, we calculated annual incidence rates of first homosexual marriage in 5-year age strata by dividing stratum-specific numbers of persons entering first homosexual marriage by corresponding stratum-specific unmarried person-years at risk during the period 1989–2001, censoring periods prior to first homosexual marriage when cohort members were heterosexually married (6.76 million person-years). Figure 1 shows annual age-specific incidence rates of first heterosexual and first homosexual marriage in 5-year age strata for the period 1989–2001, when both types of marriage were possible in Denmark.

Marriage rate ratios (RRs)

In all subsequent analyses, we performed log-linear Poisson regression on the marriage incidences with the use of the log of the follow-up times as the offset to estimate marriage rate ratios (RRs) between groups of persons with different values of the studied childhood variables. Specifically, we used the GENMOD procedure in SAS version 8.2 (SAS Institute, Gary, NC) to calculate RRs and 95 percent Wald test-based confidence intervals (CIs). For two variables (parental age difference and parents' vital status), we performed likelihood ratio tests for homogeneity to examine if RRs were statistically similar across variable categories by referring the change in deviance to the relevant chi-square distribution. We also estimated, in tests for linear trends, the change in RR associated with each one-year increase for age and duration variables and with each additional sibling. In trend tests, we treated categorical variables as continuous variables and, for closed-end categories, the numeric value was chosen as the midpoint within the category (e.g., 22.5 in age interval 20–24 years). For open-end parental age categories, we used the following values: 19 for mother's or father's age <20 years, and 37 for mother's or fathers age 35+ years. For sibling variables, the value assigned to open-end upper categories was set at the lowest value within the category (e.g., 3 for 3+ older siblings).

Birth place

We examined whether marriage rates differed according to the urbanization level of birth place in five geographic categories: (1) the "capital" including Copenhagen and

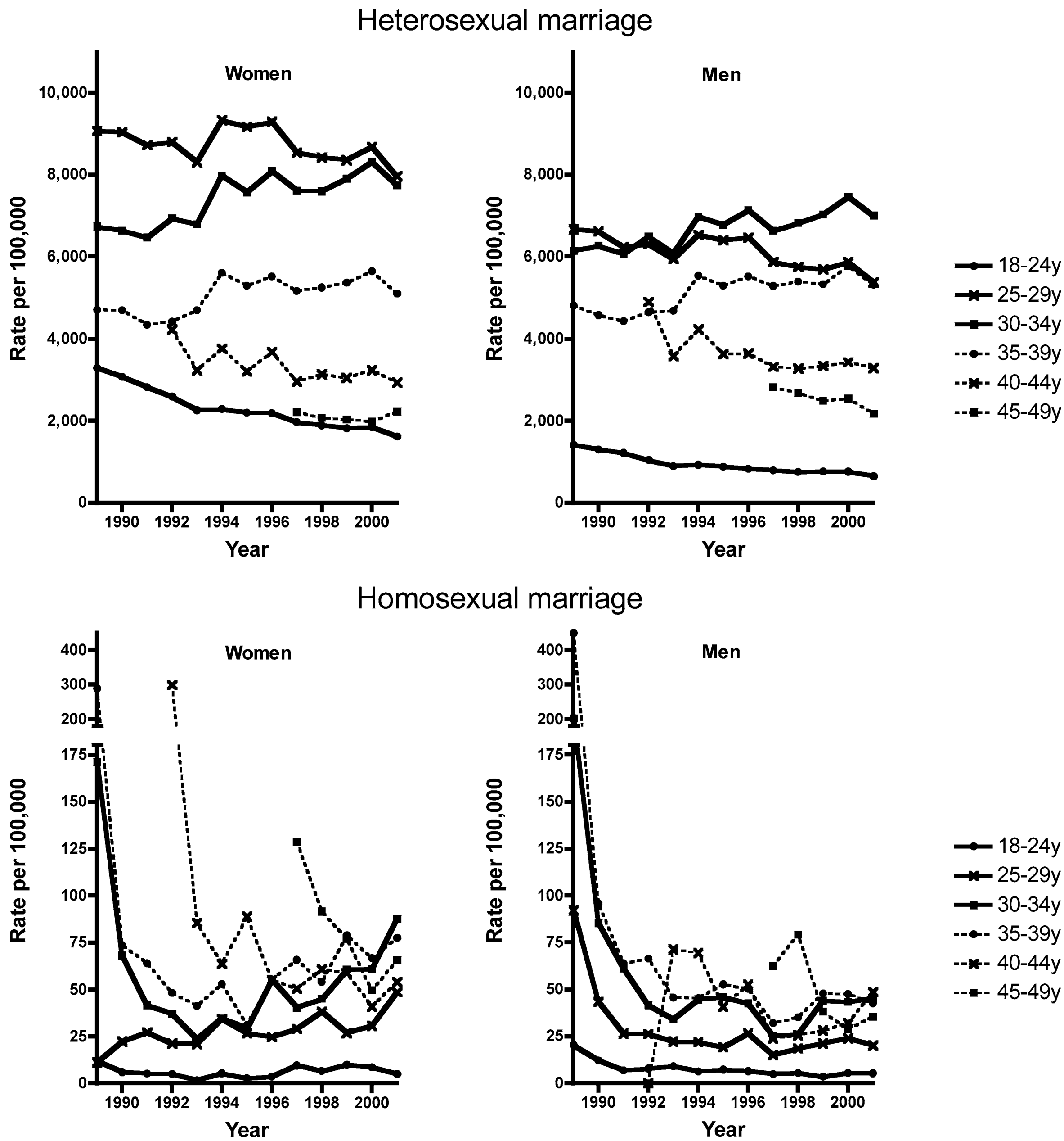

Fig. 1 Age-specific rates of first heterosexual and homosexual marriages (per 100,000 person-years) in 5-year age intervals among 18–49 year-old Danes, period 1989–2001

Frederiksberg counties; (2) "capital suburbs" including suburbs of Copenhagen; (3) "large cities" including cities other than Copenhagen with more than 100,000 inhabitants; (4) "medium-sized towns" including towns with 10,000–99,999 inhabitants, and (5) "small towns/rural areas" [= reference] including towns or areas with less than 10,000 inhabitants.

Parental factors

By study design, we had information about mothers of all cohort members. We examined whether marriage rates differed between cohort members with known and unknown father's identity and according to differences in mother's age at birth (<20 [= reference], 20–24, 25–29, 30–34, 35 + years). We then restricted the focus to persons with known fathers to examine the impact of father's age at birth (<20 [= reference], 20–24, 25–29, 30–34, 35 + years) and parental age difference (father 10 + years older, father 5–9 years older, father 1–4 years older, parents same age ± 1 year [= reference], mother 1–4 years older, mother 5 + years older). We also studied the impact of parents' vital status during childhood and adolescence on subsequent marriage patterns. Persons who experienced the death of one parent (at age <1, 1–5, 6–11, 12–17 years) or both parents (at age <12, 12–17 years) were grouped according to their age at the (last) loss of a parent; cohort members having two living parents on their 18th birthday served as reference.

In all subsequent analyses of parental factors, we compared marriage rates between subgroups of cohort members whose both parents were known and alive on their 18th birthday. Specifically, we compared first marriage incidence rates according to parental relationship characteristics, including duration of parental marriage in childhood and adolescence (0 [= parents never married], <6, 6–11, 12–17, 18 [= reference, parents married throughout proband's 18 years of childhood and adolescence] years), and age at parental divorce (0 [= parents never married], <1, 1–2, 3–5, 6–11, 12–17, 18 [= reference, parents still married at proband's 18th birthday] years). For cohort members born between 1968–1983, a subgroup with relevant address information available in the CRS, we studied measures of parental cohabitation regardless of their marital status. Specifically, we studied age at end of cohabitation with both parents (0 [= never cohabited with both parents], <1, 1–2, 3–5, 6–11, 12–17, 18 [= reference, both parents still cohabiting with proband at age 18] years), duration of cohabitation with both parents (0–5, 6–11, 12–<17.5, 17.5–18 [= reference] years), duration of father-absent cohabitation with mother (0–5 [= reference], 6–11, 12-<17.5, 17.5–18 years), and duration of mother-absent cohabitation with father (0–5 [= reference], 6–11, 12-<17.5, 17.5–18 years). Throughout, categories with the highest degree of parental relationship stability were chosen as reference. The upper category for duration of cohabitation variables (17.5–18 years) was different from that used for duration of parental marriage (exactly 18 years), because parents may have had stable relationships despite short (e.g., work-related) periods of living apart from each other.

Sibling factors

Because father-child links are less complete and accurate than mother-child links, we defined a proband's siblings as all persons recorded in the CRS as having the same mother on the proband's 18th birthday, regardless of the identity of the father. We compared marriage rates according to whether persons had siblings or not (0 [= reference], 1+), and according to numbers of older siblings, older brothers, and older sisters (0 [= reference], 1, 2, 3+), and numbers of younger siblings, younger brothers, and younger sisters (0 [= reference], 1, 2, 3+). Siblings of probands in families with twins or multiplets comprised all siblings born on another day than the proband. Thus, for singletons, we counted older and younger brothers and sisters who were part of a twin or multiplet set as individual siblings whereas for probands who were themselves members of a twin or multiplet set we counted only older and younger siblings.

Multivariate analysis strategy

In a series of log-linear Poisson regression analyses, we included a number of covariates selected a priori as potential confounders. In calculations of RRs for birth place and parental factors, we adjusted for age (18–19 to 48–49 years) and calendar period (1970–1971 to 2000–2001) in two-year intervals, birth place (in five categories according to level of urbanization, see above), mother's age (<20, 20–24, 25–29, 30–34, 35+ years), father's age (<20, 20–24, 25–29, 30–34, 35+ years), number of older siblings (0, 1, 2, 3+), number of younger siblings (0, 1, 2, 3+), and multiple birth status (three categories [singleton, twin, triplet or higher] in analyses of heterosexual marriage; two categories [singleton, twin or higher] in analyses of homosexual marriage). RRs for birth place and for parental age variables were additionally adjusted for differences in the duration of parental marriage (0, <6, 6–11, 12–17, 18 years). Father's age was omitted from models calculating RRs for parental age difference and father's identity. In calculations of RRs for sibship factors, we adjusted similarly for age, calendar period, birth place, mother's age, father's age, multiple birth status, and duration of parental marriage. Additionally, RRs for older siblings, older brothers, and older sisters were adjusted for the number of younger siblings, and RRs for younger siblings, younger brothers, and younger sisters were adjusted for the number of older siblings. In all analyses, two-sided p values $<.05$ and 95% CIs excluding unity were considered statistically significant.

The study was approved by the Danish data protection agency (approval no. 2003–41–3329).

Results

Annual age-specific incidence rates of first heterosexual and homosexual marriages are shown for the period 1989–2001, when both types of marriage were possible in Denmark (Fig. 1). While heterosexual marriage rates halved among persons age 18–24 years, corresponding rates increased among persons aged 30–39 years. Rates of homosexual marriage were high immediately after its legalization in 1989, notably for men. Since then, homosexual marriage rates tended to stabilize for men, whereas for women aged 25–39 years rates of homosexual marriage have increased in recent years.

Birth place

Figure 2 shows rate ratios for heterosexual and homosexual marriages according to level of urbanization at birth, using birth place in small towns/rural areas as the reference. After adjustment for age, calendar period, and parent and sibship factors, men and women born in the capital area were

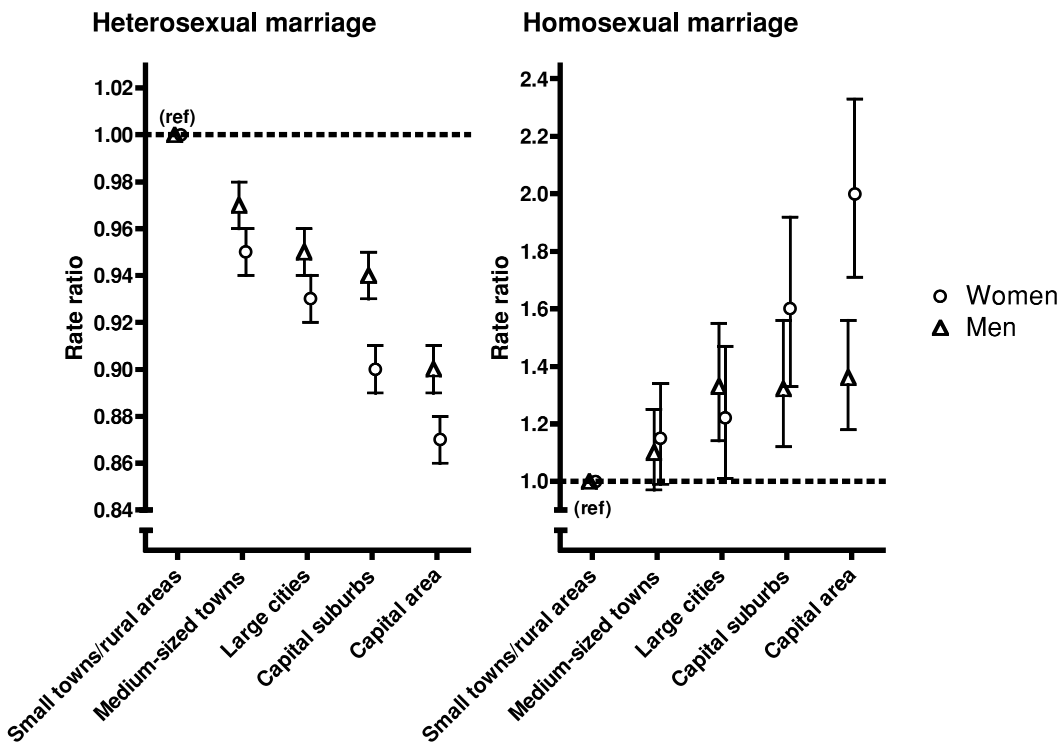

Fig. 2 Rate ratios of first heterosexual marriage (1970–2001) and first homosexual marriage (1989–2001) according to birth place. Rate ratios are adjusted for differences in age, calendar period, mother's age, father's age, duration of parental marriage, multiple birth status, number of older siblings, and number of younger siblings. Vertical bars denote 95% confidence intervals

significantly less likely to marry heterosexually than peers born in small towns/rural areas, 10% (i.e., 1–0.90) and 13% (i.e., 1–0.87) respectively, while they were more likely to marry homosexually, 36% (i.e., 1.36–1) and 100% (i.e., 2.00–1) respectively (Fig. 2).

Parental factors

Men and women with unknown fathers were significantly less likely to marry heterosexually than peers with known fathers (Table 1). As indicated by the RR estimates for heterosexual marriage in Table 1, 0.79 and 0.84 respectively, men with unknown fathers were 21% (i.e., 1–0.79) less likely and women with unknown fathers were 16% (i.e., 1–0.84) less likely to marry heterosexually than their peers with known fathers. Associations were not statistically significant for homosexual marriage, although men with unknown fathers were 18% (i.e., 1.18–1) more likely to marry a same-sex partner.

Maternal and paternal ages were both significantly inversely associated with heterosexual marriage (Table 1). The age of the same-sex parent appeared to be more influential than the age of the opposite-sex parent. Men with 35 + year-old fathers were 18% less likely to marry heterosexually than men with <20 year-old fathers, while men with the oldest mothers were 8% less likely to do so, compared with those with the youngest mothers. Among women, those with the oldest mothers were 18% less likely to marry heterosexually than women with the youngest mothers, while women with the oldest fathers were 11% less likely to do so than those with the youngest fathers (p values for trend <.001). In contrast, mother's age, but not father's age, was directly linked to the likelihood of homosexual marriage among men, with an increase in RR of 1.4% per one-year increase in maternal age (p trend <.05). Specifically, men with 35 + year-old mothers had significantly (34%) higher homosexual marriage rates than men with <20 year-old mothers. Among women, there was no significant association of either parent's age with homosexual marriage.

Persons whose mother was older than the father, and persons whose father was 5 + years older than the mother, had significantly lower heterosexual marriage rates than persons with same-age (± 1 year) parents ($p < .001$) (Table 1). Associations of parental age difference with homosexual marriage were not statistically significant.

Men who experienced parental death during childhood or adolescence had significantly (5–6%) lower heterosexual marriage rates than peers whose parents were both alive on their 18th birthday (Table 2). The younger the age at the father's death, the lower was the likelihood of heterosexual marriage. Overall, parental death had little influence on girls' future marriage propensities, except among women who lost

Table 1 Heterosexual and homosexual marriages in Denmark, rate ratios according to parent characteristics at birth

	Men						Women					
	Heterosexual marriage			Homosexual marriage			Heterosexual marriage			Homosexual marriage		
	N	RR	95%CI	*N*	RR	95%CI	*N*	RR	95%CI	*N*	RR	95%CI
Father's identity	429181			1890			453121			1573		
Known	413071	**1**	(ref)	1771	**1**	(ref)	437420	**1**	(ref)	1487	**1**	(ref)
Unknown	16110	**0.79**	(0.77–0.80)	119	**1.18**	(0.98–1.43)	15701	**0.84**	(0.83–0.86)	86	**0.98**	(0.79–1.23)
Mother's age (in yrs)	429181			1890			453121			1573		
<20	39757	**1**	(ref)	145	**1**	(ref)	42982	**1**	(ref)	131	**1**	(ref)
20–24	149815	**0.95**	(0.94–0.97)	591	**1.09**	(0.90–1.33)	161440	**0.91**	(0.90–0.92)	528	**1.03**	(0.84–1.27)
25–29	130067	**0.92**	(0.91–0.94)	585	**1.14**	(0.92–1.42)	137255	**0.82**	(0.81–0.83)	506	**1.05**	(0.84–1.32)
30–34	69439	**0.91**	(0.90–0.93)	346	**1.21**	(0.95–1.54)	71263	**0.79**	(0.78–0.81)	264	**1.00**	(0.77–1.29)
35 +	40103	**0.92**	(0.91–0.94)	223	**1.34**	(1.03–1.76)	40181	**0.82**	(0.81–0.84)	144	**1.00**	(0.74–1.35)
Change in RR per year (trend)			*− 0.4%******			*+ 1.4%**			*− 1.1%******			*− 0.1%, ns*
Father's age (in yrs)	413071			1771			437420			1487		
<20	9004	**1**	(ref)	39	**1**	(ref)	9981	**1**	(ref)	29	**1**	(ref)
20–24	86496	**0.96**	(0.94–0.98)	298	**0.86**	(0.61–1.22)	94281	**0.97**	(0.95–0.99)	300	**1.18**	(0.79–1.74)
25–29	135170	**0.90**	(0.87–0.92)	568	**0.99**	(0.70–1.41)	144997	**0.91**	(0.89–0.93)	484	**1.16**	(0.78–1.74)
30–34	94811	**0.85**	(0.83–0.87)	439	**0.99**	(0.69–1.42)	98140	**0.88**	(0.86–0.90)	362	**1.22**	(0.81–1.84)
35 +	87590	**0.82**	(0.80–0.84)	427	**0.91**	(0.63–1.32)	90021	**0.89**	(0.87–0.91)	312	**1.15**	(0.75–1.76)
Change in RR per year (trend)			*−1.2%******			*+0.4%, ns*			*− 0.6%******			*− 0.1%, ns*
Parental age difference (in yrs)	413071			1771			437420			1487		
Father 10 + older	30392	**0.85**	(0.84–0.86)	163	**1.17**	(0.96–1.44)	32269	**0.93**	(0.92–0.95)	116	**0.92**	(0.73–1.15)
Father 5–9 older	102000	**0.93**	(0.92–0.94)	409	**1.03**	(0.87–1.21)	105905	**0.98**	(0.97–0.99)	317	**0.86**	(0.72–1.02)
Father 1–4 older	195662	**0.99**	(0.99–1.00)	833	**1.13**	(0.97–1.31)	208911	**1.00**	(0.99–1.00)	716	**0.97**	(0.83–1.12)
Same age (± 1)	57850	**1**	(ref)	230	**1**	(ref)	62134	**1**	(ref)	232	**1**	(ref)
Mother 1–4 older	23577	**0.97**	(0.96–0.99)	113	**1.08**	(0.86–1.36)	24514	**0.96**	(0.94–0.97)	95	**0.93**	(0.73–1.18)
Mother 5 + older	3590	**0.94**	(0.91–0.98)	23	**1.17**	(0.76–1.81)	3687	**0.95**	(0.92–0.98)	11	**0.61**	(0.33–1.13)
χ^2 *test for homogeneity*[a]			***			*ns*			***			*ns*

Note. All RRs adjusted for differences in age, calendar period, birth place, mother's age, number of older siblings, number of younger siblings, and multiple birth status. RR for mother's age also adjusted for father's age, and RRs for mother's age, father's age, and parental age difference also adjusted for duration of parental marriage. Marriages cover the age span 18-49 years among persons born 1952–1983, RR: rate ratio, CI: confidence interval, ns: not significant.

[a]Heterosexual marriage: men, $\chi^2(6) = 862.7$, $p < .001$; women, $\chi^2(6) = 208.3$, $p < .001$. Homosexual marriage: men, $\chi^2(6) = 3.70$, ns; women, $\chi^2(6) = 3.34$, ns.

***$p < .001$, **$p < .01$, *$p < .05$.

Table 2 Heterosexual and homosexual marriages in Denmark, rate ratios according to parents' vital status and parental marriage characteristics

	Men						Women					
	Heterosexual marriage			Homosexual marriage			Heterosexual marriage			Homosexual marriage		
	N	RR	95%CI	*N*	RR	95%CI	*N*	RR	95%CI	*N*	RR	95%CI
Parents' vital status (age in yrs)	413071			1771			437420			1487		
Both parents alive at age 18	395513	**1**	(ref)	1681	**1**	(ref)	417168	**1**	(ref)	1397	**1**	(ref)
Mother died, any age <18	4883	**0.94**	(0.91–0.97)	27	**1.05**	(0.71-1.53)	5654	**0.99**	(0.97–1.02)	36	**1.64**	(1.17–2.28)
<1	18	**1.18**	(0.75–1.88)				18	**0.64**	(0.41–1.02)			
1–5	249	**0.93**	(0.82–1.05)	9	**1.08**	(0.56–2.08)	328	**0.98**	(0.88–1.10)	8	**1.06**	(0.53–2.13)
6–11	1157	**0.88**	(0.83–0.93)				1511	**1.01**	(0.96–1.06)			
12–17	3459	**0.96**	(0.93–1.00)	18	**1.03**	(0.65–1.64)	3797	**0.99**	(0.96–1.02)	28	**1.93**	(1.33–2.81)
Father died, any age <18	12307	**0.95**	(0.93–0.97)	59	**0.93**	(0.72–1.21)	14176	**0.99**	(0.97–1.01)	53	**0.99**	(0.75–1.31)
<1	77	**0.86**	(0.69–1.08)				113	**0.89**	(0.74–1.07)			
1–5	720	**0.87**	(0.81–0.94)	22	**1.03**	(0.67–1.57)	1021	**0.93**	(0.88–0.99)	22	**1.13**	(0.74–1.73)
6–11	3033	**0.92**	(0.89–0.95)				3801	**0.97**	(0.94–1.00)			
12–17	8477	**0.97**	(0.95–0.99)	37	**0.88**	(0.64–1.22)	9241	**1.01**	(0.99–1.03)	31	**0.91**	(0.64–1.31)
Both parents died, any age <18	368	**0.91**	(0.82–1.01)				422	**1.06**	(0.97–1.17)			
<12	68	**0.93**	(0.73–1.18)	4	**1.77**	(0.66–4.72)	74	**1.06**	(0.84–1.33)	1	**0.61**	(0.09–4.33)
12–17	300	**0.91**	(0.81–1.02)				348	**1.06**	(0.96–1.18)			
χ^2 *test for homogeneity*[a]			***			*ns*			*ns*			*ns*
Duration of parental marriage (in yrs)	395513			1681			417168			1397		
18	322783	**1**	(ref)	1272	**1**	(ref)	330221	**1**	(ref)	1041	**1**	(ref)
12–17	29077	**0.85**	(0.84–0.86)	149	**1.13**	(0.95–1.35)	34449	**0.88**	(0.87–0.89)	117	**0.90**	(0.74–1.09)
6–11	16325	**0.83**	(0.82–0.85)	87	**1.11**	(0.89–1.38)	20099	**0.88**	(0.87–0.90)	91	**1.14**	(0.92–1.42)
<6	13752	**0.84**	(0.82–0.85)	86	**1.36**	(1.09–1.70)	16109	**0.91**	(0.89–0.92)	79	**1.26**	(1.00–1.60)
Parents never married	13576	**0.76**	(0.75–0.77)	87	**1.21**	(0.97–1.52)	16290	**0.83**	(0.82–0.84)	69	**0.98**	(0.76–1.25)
Change in RR per year (trend)[b]			+1.6%***			*− 1.8%***			+1.0%***			*− 1.4%**
Age at parental divorce (in yrs)	395513			1681			417168			1397		
Parents still married at age 18	350352	**1**	(ref)	1392	**1**	(ref)	358796	**1**	(ref)	1146	**1**	(ref)
12–17	14959	**0.85**	(0.84–0.87)	97	**1.29**	(1.04–1.59)	18908	**0.91**	(0.90–0.92)	84	**1.06**	(0.84–1.32)
6–11	11384	**0.83**	(0.81–0.84)	70	**1.23**	(0.96–1.57)	15359	**0.91**	(0.90–0.93)	67	**1.07**	(0.83–1.38)
3–5	4119	**0.82**	(0.79-0.84)				5914	**0.91**	(0.88–0.93)			
1–2	1027	**0.76**	(0.71–0.81)	35	**1.39**	(0.98–1.96)	1750	**0.91**	(0.87–0.95)	31	**1.00**	(0.70–1.44)
<1	96	**0.74**	(0.61–0.91)				151	**0.83**	(0.71–0.97)			
Parents never married	13576	**0.78**	(0.76–0.79)	87	**1.21**	(0.97–1.51)	16290	**0.85**	(0.83–0.86)	69	**0.97**	(0.76–1.24)
Change in RR per year (trend)[b]			*+2.1%****			*− 2.5%***			*+1.0%****			*− 0.3%, ns*

Note. All RRs adjusted for differences in age, calendar period, birth place, mother's age, father's age, number of older siblings, number of younger siblings, and multiple birth status. Marriages cover the age span 18–49 years among persons born 1952–1983. RR: rate ratio, CI: confidence interval, ns = not significant.

[a]Heterosexual marriage: men, $\chi^2(10) = 73.1$, $p < .001$; women, $\chi^2(10) = 16.2$, ns. Homosexual marriage: men, $\chi^2(5) = 1.78$, ns; women, $\chi^2(5) = 10.7$, ns.

[b]Trend test among persons with married parents.

$^{***}p < .001$, $^{**}p < .01$, $^{*}p < .05$.

their mothers at age 12–17 years. These women opted for homosexual marriage almost twice as often as women who did not experience the loss of a parent (RR = 1.93; 95% CI: 1.33–2.81).

Men and women whose parents never married were significantly less likely themselves to marry heterosexually, 24 and 17% respectively, than persons whose parents were married during all 18 years of childhood and adolescence (Table 2). Conversely, the shorter the duration of parental marriage, the higher was the likelihood of homosexual marriage. Specifically, homosexual marriage rates were 36 and 26% higher among men and women, respectively, who experienced parental divorce after less than six years of marriage than among peers whose parents remained married for all 18 years of childhood and adolescence.

Almost regardless of the age at parental divorce, daughters of divorce had around 9% lower heterosexual marriage rates than peers growing up in intact families (Table 2). For men, the age at parental divorce had a significant impact on the likelihood of heterosexual marriage (p trend $<.001$). Specifically, men who experienced parental divorce before age 3 years had around 25% lower heterosexual marriage rates than peers from intact families. In contrast, men whose parents divorced before their 6th birthday were 39% more likely to marry homosexually than peers from intact parental marriages. Studying parental cohabitation rather than parental marriage gave consistent results (Table 3). Specifically, men whose cohabitation with both parents ended before age 18 years had significantly (55–76%) higher rates of homosexual marriage than men who cohabited with both parents until age 18 years.

Sibling factors

Men and women with siblings had significantly higher heterosexual marriage rates, 4 and 6% respectively, and lower same-sex marriage rates, 11 and 15% respectively, compared with peers who grew up as only children (Table 4). Persons growing up as the eldest child in a sibship were less likely to marry heterosexually than peers of later birth order. Indeed, heterosexual marriage rates increased steadily with increasing numbers of older siblings, a pattern that applied both to having older brothers and older sisters (p values for trend $<.001$).

Associations of older siblings with homosexual marriage were less uniform. Older brothers were not significantly associated with homosexual marriage in either sex, but older sisters were. There was a barely significant tendency for men with older sisters to enter homosexual marriage (RR = 1.60; 95% CI: 0.99–2.59 for 3+ older sisters vs. none). In contrast, homosexual marriage rates among women dropped significantly by 12.7% with each older sister (p trend $<$ .01).

Younger siblings were less strongly associated with heterosexual marriage rates than older siblings (Table 4). However, with each younger sibling the homosexual marriage rate decreased by 9.2% for men (p trend $<.01$) and by 13.7% for women (p trend $<.001$). Both men and women who grew up as the youngest child in a sibship were significantly more likely to marry homosexually than peers with younger siblings.

To examine if certain sibship positions were particularly conducive to either type of marriage, we calculated RRs for 35 different sibship combinations among persons from families with 1, 2, 3, or 4 children, using marriage rates among persons who grew up as only children as reference (Fig. 3). This analysis corroborated the view that heterosexual marriage rates increase with increasing sibship size among both men and women and, within each category of sibship size, with increasing numbers of older siblings (i.e., with increasing birth order). Associations were more diverse for homosexual marriage. However, three first-born sibship positions were associated with significantly reduced rates of homosexual marriage, and three last-born sibship positions were associated with significantly increased rates of homosexual marriage.

Discussion

Major changes have taken place in family structure and dynamics during the period covered by our study. In Denmark, the average age at first heterosexual marriage increased from 25.1 to 32.8 years for men and from 22.9 to 30.3 years for women between 1970 and 2001 (Statistics Denmark, 2004). At the same time, divorce and remarriage rates increased and, as in other Western countries (Berrington & Diamond, 2000; Bumpass & Sweet, 1989; Graefe & Lichter, 1999), non-married co-residential unions between man and woman gradually became accepted. In Scandinavia and other secularized countries, persons who stayed single and those who formed alternative families, including with partners of their own sex, have gradually gained broad social and legal acceptance.

With this study, we shed new light on a number of childhood factors that might impact on marital choices in adulthood. Methodologically, our investigation had several advantages, of which the most important were its prospective design and the long-term and virtually complete registry coverage of the entire Danish population (Frank, 2000). These study characteristics eliminated the risk that our results would arise from spurious information or selection biases. Other major assets included the size of the cohort, providing statistical power to detect even modest associations that would be missed in smaller studies. Additionally, we restricted the study cohort to comprise only persons born by

Table 3 Heterosexual and homosexual marriages in Denmark, rate ratios according to parental cohabitation characteristics

	Men						Women					
	Heterosexual marriage			Homosexual marriage			Heterosexual marriage			Homosexual marriage		
	N	RR	95%CI	*N*	RR	95%CI	*N*	RR	95%CI	*N*	RR	95%CI
Age at end of cohabitation with both parents (in yrs)	79254			391			115899			414		
18	56739	**1**	(ref)	226	**1**	(ref)	75054	**1**	(ref)	256	**1**	(ref)
12–17	8386	**0.98**	(0.95–1.00)	60	**1.76**	(1.32–2.34)	18078	**1.15**	(1.13–1.17)	67	**1.23**	(0.94–1.62)
6–11	5367	**0.82**	(0.80–0.85)	41	**1.55**	(1.11–2.18)	8338	**0.93**	(0.91–0.95)	32	**0.95**	(0.66–1.38)
3–5	3136	**0.82**	(0.79–0.85)				4876	**0.94**	(0.91–0.97)			
1–2	1884	**0.82**	(0.78–0.86)	44	**1.55**	(1.11–2.17)	3260	**0.95**	(0.92–0.99)	40	**1.05**	(0.75–1.48)
<1	539	**0.84**	(0.77–0.92)				1000	**0.95**	(0.90–1.02)			
Never cohabited with both parents	3203	**0.78**	(0.75–0.81)	20	**1.19**	(0.74–1.90)	5293	**0.92**	(0.89–0.95)	19	**0.88**	(0.55–1.42)
Change in RR per year (trend)			*+1.6%****			*− 3.1%***			*+0.5%****			*− 0.1%, ns*
Duration of cohabitation with both parents (in yrs)	79254			391			115899			414		
17.5–18	44122	**1**	(ref)	184	**1**	(ref)	61905	**1**	(ref)	224	**1**	(ref)
12-<17.5	18025	**0.99**	(0.98–1.01)	84	**1.18**	(0.91–1.53)	26909	**1.03**	(1.02–1.05)	75	**0.85**	(0.65–1.11)
6–11	7260	**0.86**	(0.84–0.88)	48	**1.38**	(1.00–1.91)	11083	**0.93**	(0.92–0.95)	50	**1.12**	(0.82–1.53)
0–5	9847	**0.81**	(0.79–0.82)	75	**1.45**	(1.09–1.91)	16002	**0.92**	(0.91–0.94)	65	**0.95**	(0.71–1.26)
Change in RR per year (trend)			*+1.5%****			*− 2.5%***			*+0.6%****			*+0.0%, ns*
Duration of father-absent cohabitation with mother (in yrs)	79254			391			115899			414		
17.5–18	1532	**0.74**	(0.71–0.78)	10	**1.00**	(0.53–1.90)	2342	**0.79**	(0.76–0.82)	10	**0.83**	(0.44–1.57)
12-<17.5	5069	**0.81**	(0.79–0.84)	41	**1.40**	(1.00–1.96)	8623	**0.90**	(0.88–0.92)	33	**0.88**	(0.61–1.27)
6–11	4822	**0.84**	(0.81–0.86)	39	**1.47**	(1.05–2.06)	8242	**0.91**	(0.89–0.93)	43	**1.25**	(0.91–1.73)
0–5	67831	**1**	(ref)	301	**1**	(ref)	96692	**1**	(ref)	328	**1**	(ref)
Change in RR per year (trend)			*− 2.0%****			*+2.4%**			*− 1.2%****			*− 0.5%, ns*
Duration of mother-absent cohabitation with father (in yrs)	79254			391			115899			414		
17.5–18	38	**0.78**	(0.57–1.07)	1	**0.30**	(0.04–2.11)	29	**0.81**	(0.57–1.17)	3	**1.30**	(0.42–4.06)
12-<17.5	502	**0.84**	(0.77–0.92)				564	**0.93**	(0.86–1.01)			
6–11	1373	**0.87**	(0.82–0.91)	6	**0.73**	(0.33–1.65)	1384	**0.92**	(0.87–0.97)	10	**1.80**	(0.96–3.38)
0–5	77341	**1**	(ref)	384	**1**	(ref)	113922	**1**	(ref)	401	**1**	(ref)
Change in RR per year (trend)			*− 1.8%****			*− 7.2%, ns*			*− 1.0%****			*+5.2%, ns*

Note. All RRs adjusted for differences in age, calendar period, birth place, mother's age, father's age, number of older siblings, number of younger siblings, and multiple birth status. Marriages cover the age span 18–34 years among persons born 1968–1983. RR: rate ratio, CI: confidence interval, ns: not significant.

***$p < .001$, **$p < .01$, *$p < .05$.

Table 4 Heterosexual and homosexual marriages in Denmark, rate ratios according to sibship characteristics

	Men						Women					
	Heterosexual Marriage			Homosexual Marriage			Heterosexual Marriage			Homosexual Marriage		
	N	RR	95%CI	*N*	RR	95%CI	*N*	RR	95%CI	*N*	RR	95%CI
Siblings	429181			1890			453121			1573		
0 (= only child)	69957	**1**	(ref)	371	**1**	(ref)	62108	**1**	(ref)	273	**1**	(ref)
1+	359224	**1.04**	(1.03–1.05)	1519	**0.89**	(0.79–1.01)	391013	**1.06**	(1.05–1.07)	1300	**0.85**	(0.74–0.98)
Older siblings	429181			1890			453121			1573		
0 (= eldest child)	241412	**1**	(ref)	1007	**1**	(ref)	236174	**1**	(ref)	814	**1**	(ref)
1	129494	**1.04**	(1.03–1.05)	597	**1.00**	(0.90–1.12)	147047	**1.05**	(1.04–1.05)	522	**0.93**	(0.82–1.05)
2	43273	**1.10**	(1.09–1.12)	206	**1.02**	(0.87–1.20)	51477	**1.14**	(1.13–1.15)	195	**1.06**	(0.89–1.26)
3+	15002	**1.13**	(1.11–1.15)	80	**1.16**	(0.91–1.47)	18423	**1.21**	(1.19–1.23)	42	**0.70**	(0.50–0.96)
Change in RR per older sibling (trend)			*+4.6%****			*+2.8%, ns*			*+6.5%****			*−3.8%, ns*
Older brothers	429181			1890			453121			1573		
0	309126	**1**	(ref)	1316	**1**	(ref)	314752	**1**	(ref)	1071	**1**	(ref)
1	96447	**1.05**	(1.04–1.06)	463	**1.06**	(0.95–1.18)	110125	**1.07**	(1.06–1.07)	402	**1.04**	(0.92–1.18)
2	19567	**1.10**	(1.09–1.12)	97	**1.08**	(0.88–1.34)	23286	**1.15**	(1.14–1.17)	91	**1.21**	(0.97–1.50)
3+	4041	**1.11**	(1.08–1.15)	14	**0.75**	(0.44–1.27)	4958	**1.24**	(1.21–1.28)	9	**0.62**	(0.32–1.20)
Change in RR per older brother (trend)			*+4.7%****			*+2.0%, ns*			*+7.2%****			*+3.4%, ns*
Older sisters	429181			1890			453121			1573		
0	330361	**1**	(ref)	1427	**1**	(ref)	337292	**1**	(ref)	1200	**1**	(ref)
1	82501	**1.03**	(1.02–1.04)	369	**0.94**	(0.84–1.06)	95831	**1.03**	(1.02–1.03)	317	**0.86**	(0.76–0.98)
2	13929	**1.06**	(1.05–1.08)	77	**1.16**	(0.91–1.46)	16987	**1.08**	(1.07–1.10)	52	**0.85**	(0.64–1.12)
3+	2390	**1.14**	(1.10–1.19)	17	**1.60**	(0.99–2.59)	3011	**1.15**	(1.11–1.19)	4	**0.41**	(0.15–1.09)
Change in RR per older sister (trend)			*+3.3%****			*+3.6%, ns*			*+3.6%****			*−12.7%***
Younger siblings	429181			1890			453121			1573		
0 (= youngest child)	177440	**1**	(ref)	923	**1**	(ref)	192453	**1**	(ref)	785	**1**	(ref)
1	153095	**1.01**	(1.01–1.02)	628	**0.89**	(0.80–1.00)	163555	**1.02**	(1.01–1.02)	529	**0.82**	(0.73–0.93)
2	70795	**1.04**	(1.03–1.05)	256	**0.86**	(0.73–1.00)	71182	**1.06**	(1.05–1.07)	211	**0.83**	(0.70–0.98)
3+	27851	**1.01**	(1.00–1.03)	83	**0.72**	(0.56–0.91)	25931	**1.06**	(1.04–1.07)	48	**0.54**	(0.40–0.74)
Change in RR per younger sibling (trend)			*+1.1%****			*−9.2%***			*+2.3%****			*−13.7%****
Younger brothers	429181			1890			453121			1573		
0	272154	**1**	(ref)	1290	**1**	(ref)	289952	**1**	(ref)	1081	**1**	(ref)
1	120235	**1.02**	(1.01–1.03)	473	**0.95**	(0.85–1.06)	130436	**1.01**	(1.00–1.02)	420	**0.93**	(0.82–1.05)
2	30186	**1.03**	(1.02–1.04)	109	**0.94**	(0.77–1.15)	27570	**1.03**	(1.02–1.05)	64	**0.72**	(0.56–0.94)
3+	6606	**0.99**	(0.97–1.02)	18	**0.71**	(0.45–1.14)	5163	**1.03**	(1.00–1.06)	8	**0.51**	(0.25–1.02)
Change in RR per younger brother (trend)			*+1.2%****			*−5.3%, ns*			*+1.2%****			*−12.2%***

Table 4 Continued.

	Men						Women					
	Heterosexual Marriage			Homosexual Marriage			Heterosexual Marriage			Homosexual Marriage		
	N	RR	95%CI	*N*	RR	95%CI	*N*	RR	95%CI	*N*	RR	95%CI
Younger sisters	429181			1890			453121			1573		
0	277363	**1**	(ref)	1332	**1**	(ref)	299899	**1**	(ref)	1121	**1**	(ref)
1	122272	**1.00**	(0.99–1.01)	463	**0.88**	(0.79–0.98)	121686	**1.03**	(1.02–1.03)	384	**0.92**	(0.82–1.04)
2	24991	**1.01**	(0.99–1.02)	82	**0.80**	(0.64–1.01)	26647	**1.05**	(1.04–1.07)	59	**0.71**	(0.54–0.92)
3+	4555	**1.00**	(0.97–1.03)	13	**0.71**	(0.41–1.23)	4889	**1.04**	(1.01–1.07)	9	**0.61**	(0.31–1.17)
Change in RR per younger sister (trend)			*+0.1%, ns*			*−11.1%***			*+2.3%****			*−12.2%***

Note. All RRs adjusted for differences in age, calendar period, birth place, mother's age, father's age, multiple birth status, and duration of parental marriage. RRs for older siblings, older brothers and older sisters additionally adjusted for number of younger siblings, and RRs for younger siblings, younger brothers and younger sisters adjusted for number of older siblings. Marriages cover the age span 18–49 years among persons born 1952–1983. RR: rate ratio, CI: confidence interval, ns: not significant.

*** $p < .001$, ** $p < .01$, * $p < .05$.

Danish born mothers, thus reducing the risk for confounding by social and cultural factors (Marjoribanks, 1999).

Our analytical approach was new in several ways. Investigators before us have studied the impact of parental relationship instability and parental age on marriage propensities in offspring, but information about the family of origin was often restricted to one or a few variables, providing a limited profile of childhood family structure. We had access to detailed information about relationship structures and transitions among virtually all parents of our cohort members. Moreover, to the best of our knowledge, our study was the first population-based investigation to study sibling factors as potential determinants of adult mating patterns and to provide simultaneous scrutiny of heterosexual and homosexual marriages. Nevertheless, some limitations apply. While we were able to control for several confounding factors, we did not have information about religious, economic, and educational variables. Adjustment for such factors had measurable effects on marriage propensities in one (Berrington & Diamond, 2000) but not another study (McLanahan & Bumpass, 1988). Due to the widespread secularism and economical egalitarianism in Denmark, we consider major religious and socioeconomic confounding to be unlikely. Moreover, to be influential, such confounding should operate independently of the level of urbanization at birth and maternal age, which we included as potential confounders in all analyses. Despite our study size, some analyses, notably those dealing with homosexual marriage, were limited by small numbers. Cautious interpretation is therefore justified.

Birth place

The level of urbanization at birth predicted the likelihood of marriage. Persons born in small towns/rural areas had significantly higher heterosexual marriage rates than peers born in the capital area. This urban-rural gradient, which likely reflects a more traditional view on marriage and cohabitation in rural populations, is in agreement with prior research (Berrington & Diamond, 2000; Duvander, 1999). However, our study also showed that persons born in large cities or in the capital area were significantly more likely to marry a same-sex partner than peers born in small towns/rural areas. While adult life in large cities may provide anonymity and other social advantages to non-heterosexual persons (Solomon, Rothblum, & Balsam, 2004), our study may be the first to show that birth place or some correlate thereof influences marital choices in adulthood, even after a number of childhood family structure characteristics that may differ between urban and rural families were taken into account.

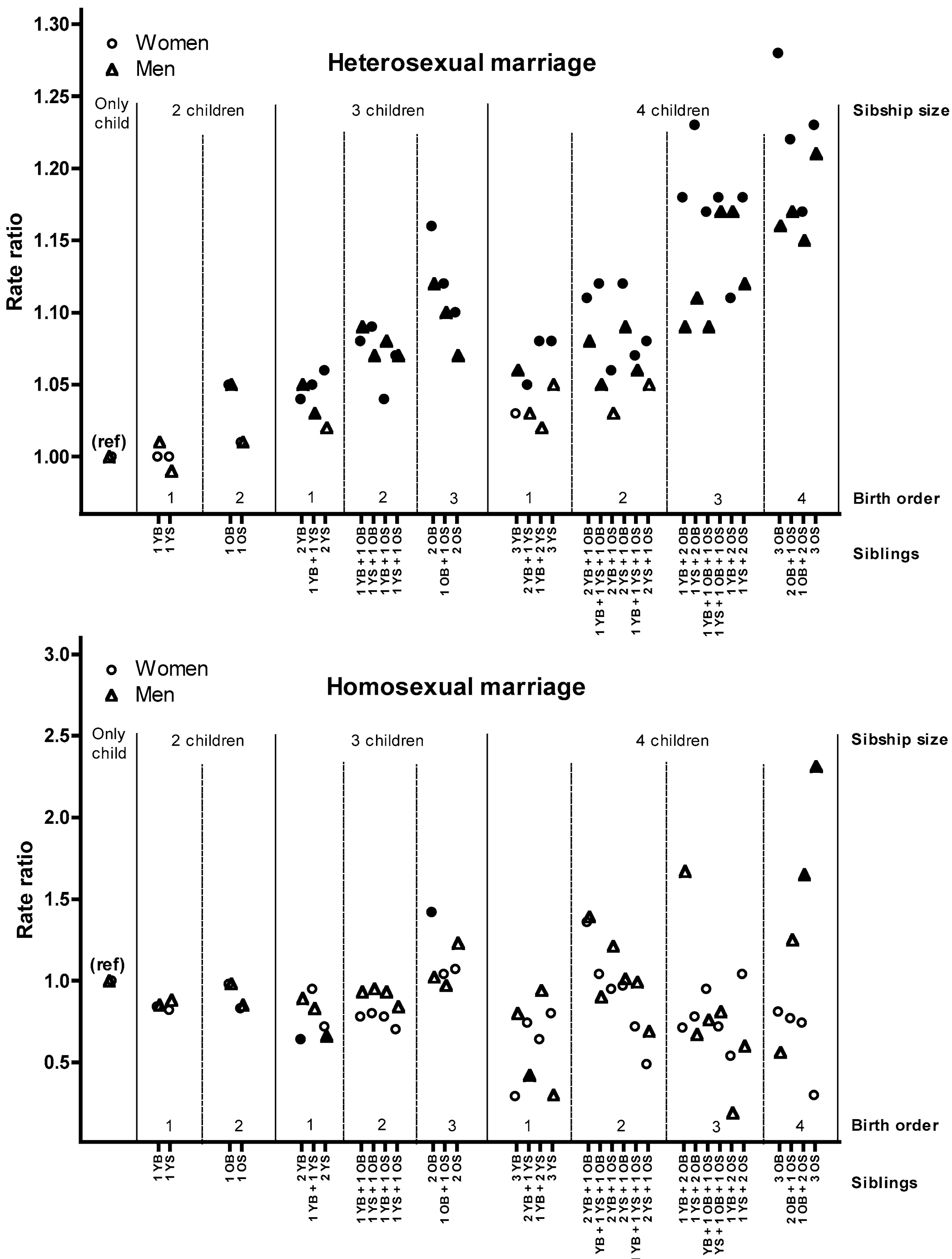

Fig. 3. Rate ratios of first heterosexual marriage (1970–2001) and first homosexual marriage (1989–2001) according to exact sibship position among persons from families with 1, 2, 3, or 4 children. Marriage rates among persons who grew up as only children served as reference. Rate ratios are adjusted for differences in age, calendar period, birth place, mother's age, father's age, duration of parental marriage, and multiple birth status. Vertical unbroken lines separate values of sibship size (1, 2, 3, or 4 children), and vertical broken lines separate birth order positions (1 = first, 2 = second, 3 = third, or 4 = fourth) within each sibship size. Detailed sibship compositions are given below the X axes (YB = younger brother, YS = younger sister, OB = older brother, OS = older sister). Rate ratios are indicated by circles (women) and triangles (men); filled circles and triangles indicate statistically significant rate ratios with 95% confidence intervals that exclude unity

Parental factors

As in other contemporary studies (Berrington & Diamond, 2000; Teachman, 2003), parental ages at childbirth were significantly and inversely linked to heterosexual marriage propensities in both male and female offspring. Particularly low heterosexual marriage rates were seen among men whose fathers and women whose mothers belonged to the oldest age category. While no previous population-based study has investigated the possible association of parental age with homosexuality in healthy subjects, one report showed a significantly older average maternal age in a group of 355 homosexual men admitted to psychiatric treatment than expected based on population statistics (Slater, 1962). Paternal age was also significantly higher in these homosexual men than expected from population data, and regression analysis suggested that high paternal age might be the more important parental age characteristic (Abe & Moran, 1969). We observed a statistically significant linear association of maternal age with homosexual marriage among men. For each one-year increase in maternal age the likelihood of homosexual marriage increased by 1.4% after adjustment for paternal age and other potential confounding factors. However, in accord with other findings (Kenyon, 1968), parental age was not associated with homosexual marriage among women.

Heterosexual marriage rates were consistently reduced when parental relationships were unstable. Persons with unknown fathers and those who experienced parental divorce, early termination of cohabitation with both parents or, among men, parental death were less likely to marry heterosexually than peers who grew up in intact parental marriages. These observations are consistent with existing evidence that parental role models are major factors in determining offspring's family-formation behaviors (McLanahan & Bumpass, 1988). Children of divorced parents have increased rates of nonmarital cohabitation (Teachman, 2003), more negative attitudes toward marriage (Axinn & Thornton, 1996), and lower marriage rates after teenage years than peers from intact homes (Berrington & Diamond, 2000; Wolfinger, 2003). We observed stronger associations for most parental relationship variables among men than women, suggesting that future mating patterns for boys may be more sensitive than those of girls to the influence of transitions in the parental relationship.

In contrast, measures of parental relationship instability were positively linked to homosexual marriage. For men, unknown paternal identity, parental divorce, short duration of cohabitation with both parents, and long duration of father-absent cohabitation with mother were all associated with increased rates of homosexual marriage. For women, associations of homosexual marriage with measures of parental relationship instability were less pronounced, but same-sex marriage rates were elevated among women who experienced maternal death during adolescence, women with short duration of parental marriage, and women with long duration of mother-absent cohabitation with father. Taken together, same-sex parental absence appeared to be more common among boys and girls who later married homosexually although, again, associations seemed stronger for boys than girls.

There are few comparable data on this topic in the literature. Homosexual persons in previous studies were often identified through psychiatric or criminal records, reflecting contemporary views on homosexuality. In one study, however, healthy homosexual men spent significantly less time with their fathers during childhood and adolescence than did a comparison group of presumed heterosexual men (Evans, 1969). In another study, a higher proportion of healthy homosexual women than of heterosexual women had experienced parental divorce (Kenyon, 1968). Whatever ingredients determine a person's sexual preferences and marital choices, our population-based study shows that parental interactions are important.

Sibling factors

Considering the psychological interactions of siblings, surprisingly little has been published about the impact of different sibship structures on subsequent marital choices. In two studies, first-born men tended to marry at slightly younger ages than later-born men (Murdoch, 1966; Walsh, 1973), but birth order showed no similar influence in women (Murdoch, 1966). Also, sibship size did not significantly affect marriage rates in a recent study of 7,477 US women (Teachman, 2003). However, these studies were much smaller than the current study and may, therefore, have lacked statistical power.

Our findings strongly suggest that siblings were influential in subsequent marital choices. Although effects were modest for most sibling factors, they differed between heterosexual and homosexual marriages. Men and women who grew up as only children were less likely to marry heterosexually but more likely to marry homosexually than persons with siblings. This finding was in accord with previous findings for women (Gundlach & Riess, 1967; Hogan, Fox, & Kirchner, 1977; Kenyon, 1968). Having brothers and sisters, notably older ones, increased the likelihood of heterosexual marriage in both sexes. However, the effect of birth order on homosexual marriage patterns was more complicated. Being the youngest child was associated with increased homosexual marriage rates in both men and women. Accordingly, having younger siblings of either sex reduced the likelihood of homosexual marriage in both men and women, as did having older sisters in women.

Based on a large series of studies from several countries, Canadian researchers have suggested that late position in a sibship may be an important determinant of adult homosexual orientation in males (reviewed in Blanchard, 2004). Because the observed later birth order of homosexual men in these studies was explained by an excess of older brothers, not older sisters, this repeatedly observed phenomenon of male homosexuality has been termed the fraternal birth order effect. Specifically, the RR for male homosexuality, as approximated by odds ratios in these studies, increased by a remarkable 33% with each older brother. The excess of older brothers has been observed in homosexual volunteer samples that may, or may not, be broadly representative of homosexual men, including participants in the original Kinsey interviews and more recent samples of American, British, and Canadian volunteers. However, support for broader, maybe universal, relevance of the fraternal birth order phenomenon was found in studies that used homosexual samples that are clearly not representative of all homosexual men, including pedophilic and hebephilic homosexuals, homosexuals in psychotherapy, gender-dysphoric homosexuals, transgendered homosexuals, and homosexual sex offenders (Blanchard, 2004). Only a few published studies have failed to support the fraternal birth order effect (Evans, 1969; Rahman & Wilson, 2003; Siegelman, 1973).

The purpose of the present study was to examine childhood family correlates of heterosexual and homosexual marriages. Because we do not know how representative men and women in same-sex marriages are of homosexuals in general, our findings should not be used incautiously to define childhood determinants of sexual orientation. Nevertheless, our findings regarding the impact of siblings on homosexual marriages in men raise questions as to the universality of the fraternal birth order hypothesis for male homosexuality. Based on a complete, national data set with childhood family information available for all 18–49 year old men who entered same-sex marriage in Denmark during the study period, we found no indication that older brothers were particularly common in these homosexual men. Rather, older siblings, whether brothers or sisters, were positively and linearly linked to higher rates of heterosexual marriage in our study. As mentioned, persons in homosexual marriages may not be representative of all homosexuals. However, in light of the large number of notoriously unrepresentative homosexual samples that have previously been found to fit with the fraternal birth order hypothesis, the discrepancy between our national cohort study, which failed to support the hypothesis, and prior, retrospective case-control studies, which almost unanimously supported it, deserve consideration. Theoretically, men in homosexual marriages might be the exception to an otherwise universal rule that older brothers are an important formative factor in male homosexuality. At this point, however, we have no plausible suggestion as to why men in homosexual marriages should differ from virtually all other studied groups of homosexual men in this regard. Alternatively, it might be useful to search for hitherto unnoticed personality factors that may have favored participation of homosexual men with older brothers in studies that used active recruitment of study subjects, or factors that may have rendered homosexual men with older brothers more likely, once enrolled in a study, to disclose their sexual orientation. Again, however, we are unable to come up with plausible suggestions as to the nature of such hypothetical distorting factors. Further independent assessment of the possible influence of older brothers in male homosexuality is warranted by the use of data from other settings and by independent research teams.

The associations we observed between childhood family characteristics and heterosexual marriage may not necessarily apply to nonmarital cohabitation. Despite relaxed moral views on matters of sexuality, cohabitation, and marriage, most people in Denmark opt for heterosexual marriage at some point. As of 2004, couples living together in unmarried cohabitation constituted less than one in five non-single households of 40-year-old Danes, and only around one in ten among 50-year-olds (Statistics Denmark, 2004). Thus, our findings with respect to heterosexual mating patterns are relevant to that large majority who formalize their unions in heterosexual marriage. On the other hand, little is known about factors that may differ between the general homosexual population and the fraction of it that we studied by means of their same-sex marriage records. As mentioned, while homosexual marriage decisions almost certainly reflect same-sex sexual preferences, it should be kept in mind that those choosing to marry their same-sex partner may not be representative of all homosexual persons.

We can not prove that the observed mating patterns were directly caused by the childhood family variables we studied, but a causal connection is highly plausible, given the formative, psychological importance of childhood. Our analysis therefore provides population-based, prospective evidence that a variety of childhood family experiences bear importantly on both heterosexual and homosexual mating patterns in adulthood.

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