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PREFERENCE FOR A FIRST-BORN BOY IN WESTERN SOCIETIES

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Summary. Many studies in the last 45 years have shown that women prefer a boy to a girl for their first-born child, suggesting that this preference is universal in Western societies. A careful examination of these studies reveals, however, that the subjects were often women who were not pregnant and/or students. A review of sixteen studies with first-time-pregnant women showed that in most cases the opposite was true, namely, that a girl was desired more often than a boy, especially during the last two decades (from 1981 to 1996). Data concerning expectant fathers, however, indicate that they prefer a boy rather than a girl. A preference for a boy first was also observe for both non-expectant males and females. Women's preference for a male child decreased and men's preference increased slightly when the two sub-periods (before 1980 vs after 1981) were compared. A difference between men and women is, however, evident whatever the sub-period: men more often prefer a boy than women. These findings suggest that something specific about being pregnant is related to the preference for a girl first.

Introduction

In the last 45 years, some authors have tried to determine women's sex preference with regard to their first-born child. Many studies point out that most women prefer a boy to a girl (Dinitz, Dynes & Clarke, 1954; Goldfarb, 1988; Markle & Nam, 1971; Steinbacher & Gilroy, 1990). Many other authors showed that women and/or men prefer a boy rather than a girl as first-born (Adelman & Rosenzweig, 1978; Arnold & Fawcett, 1975; Buckhout, 1972; Dixon & Levy, 1985; Fidell, Hoffman & Keith-Spiegel, 1979; Gilroy & Steinbacher, 1983; Goodenought, 1957; Gustavus Philliber, 1980; Largey, 1972; Markle, 1974; Markle & Wait, 1976; Marleau & Saucier, 1993; Norman, 1974; Pebley & Westoff, 1982; Peterson & Peterson, 1973; Pharis & Manosevitz, 1984; Rao & Rao, 1981; Rent & Rent, 1977; Rodgers, 1979; Rosenzweig & Adelman, 1976; Sensibaugh & Yarab, 1997; Westoff & Rindfuss, 1974; Wood, 1975). These findings give the strong impression that the preference for a boy as a first-born child has been almost universal among women in Western societies

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since the 1950s (Markle, 1974; Steinbacher & Gilroy, 1996). For the most part, these studies were conducted with samples of college students or populations recruited in fertility studies. As such, their findings were based on a hypothetical situation that might not have arisen in the subjects' lives.

Steinbacher & Gilroy (1985) argued that an assessment of maternal sex preference during pregnancy would be more realistic; since 'women had already conceived and were carrying a child, it seemed that the question of sex preference was quite salient and had been considered and discussed' (Pharis & Manosevitz, 1984; Westoff & Rindfuss, 1974). The objective of this study is to present data from the literature concerning the sex preferences of first-time-pregnant women and their spouses. Data concerning non-pregnant women and men are also reviewed to determine whether the pattern of first-child preference has changed since the first study conducted by Dinitz *et al.* (1954) with a sample of students. It is widely believed that the social status of women has changed in the last 50 years, one consequence of which may be a decrease in the preference for a boy as a first-born child (Norman, 1974; Pharis & Manosevitz, 1984; Steinbacher & Gilroy, 1985).

Methods

A literature search was conducted in *Medline*, *Psycinfo* and *Sociofile*, using the keywords: expectant, pregnant, pregnancy, first, first-born, boy, girl, son, daughter and preference. The search was limited to English- and French-language studies. The three databases were used to find papers about Western societies. Four papers were found in the *Medline* database, four in the *Psycinfo* database and one in the *Sociofile* database. No new paper was found in the *Popline* database, where a special search was made on the advice of a reviewer. Other references were found in the bibliography of articles ($n=7$). The search yielded sixteen empirical studies in which it was possible to obtain preference (boy or girl) and non-preference percentages for first-time-pregnant women. Only those studies permitting the determination of these three percentages were retained for the present analysis.

The sixteen studies were published between 1948 and 1996. Seven were in the United States (Choi, 1986; Kruegel, 1975; Leifer, 1980; Pharis & Manosevitz, 1980; Steinbacher & Gilroy, 1985; Walker, 1992; Walker & Conner, 1993), four in England (Kruk, 1981; Oakley, 1978; Saucier, 1982; Zajicek, 1981), three in Sweden (Dahlberg, 1948; Stattin & Klackenberg-Larsson, 1991; Uddenberg, Almgren & Nilsson, 1971), one in Israel (Teichman, Rabinovitz & Rabinovitz, 1992) and one in Canada (Marleau *et al.*, 1996, 1997). In four other studies, the authors did not provide separate data for female and male subjects (Atkinson, 1979; Calway-Fagen, Wallston & Gabel, 1979; Pedersen, 1982; Pharis & Manosevitz, 1984); and in three others, it was not possible to determine whether it was a first, second or third pregnancy (Eckard, 1978; Rabinowici, 1985; Westoff & Rindfuss, 1974). Lastly, in some of the studies, it was also possible to obtain a percentage of preference and non-preference by the expectant fathers (Dahlberg, 1948; Entwisle & Doering, 1981; Pharis & Manosevitz, 1980; Saucier, 1982, 1996; Stattin & Klackenberg-Larsson, 1991; Uddenberg *et al.*, 1971; Walker & Conner, 1993). It is important to note, however, that in five of the eight studies, the information about first-born preference was

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provided by the women (Dahlberg, 1948; Saucier, 1996; Stattin & Klackenberg-Larsson, 1991; Uddenberg *et al*., 1971; Walker & Conner, 1993). This paper compares the preference percentages of the two groups: those obtained from women, and those obtained directly from expectant fathers.

Given that these sixteen studies cover the relatively long period of almost 50 years and that during that time the social status of women has changed significantly, whether the level of sex preference has changed over that half-century was tested by contrasting two sub-periods. In order to compare present results with other authors the lead of Sensibaugh & Yarab (1997), who divided the studies into a first group of 'early research' (1948–1980) and a second group of 'more recent studies' (1981–1996), was followed. No other study has been published since 1996. A girl/boy ratio was calculated for each study. The calculation was based on the absolute number found in these studies; that is, the number of individuals preferring a girl divided by the number of individuals preferring a boy. A ratio higher than 1·0 indicates preference for a girl and a ratio lower than 1·0 indicates preference for a boy.

Lastly, twelve studies were also found that permit a determination of preference and non-preference percentages for samples of non-pregnant women (Dinitz *et al*., 1954; Gilroy & Steinbacher, 1983; Goldfarb, 1988; Goodenought, 1957; Markle & Nam, 1971; Marleau & Saucier, 1993; Pebley & Westoff, 1982; Peterson & Peterson, 1973; Markle, 1974; Norman, 1974; Rent & Rent, 1977; Steinbacher & Gilroy, 1990). Nine of these studies were conducted with samples of college students, two used data from fertility surveys (Marleau & Saucier, 1993; Pebley & Westoff, 1982) and two were carried out with couples who already had a child (Goodenought, 1957; Markle, 1974). All the studies were conducted in the United States, except that by Marleau & Saucier (1993), which was conducted in Canada. Also, the women in these twelve studies were presumed to be non-pregnant at the time of the survey. Here again, for the sake of comparison with the current analysis with pregnant women, the twelve studies are divided into two sub-periods: the first one ending in 1980 ('early studies') and the second one starting in 1981 ('more recent studies').

Preference percentages for men who were not partners of pregnant women were found in eight of the studies (Dinitz *et al*., 1954; Goodenought, 1957; Gilroy & Steinbacher, 1983; Goldfarb, 1988; Markle & Nam, 1971; Norman, 1974; Peterson & Peterson, 1973; Steinbacher & Gilroy, 1990). With the exception of Goodenought (1957), all these studies were conducted with samples of students.

Chi-square tests were used to examine the relationship between the two periods (early and recent) and the women's (and also men) preference, and more specifically to test the null hypothesis that the two criteria of classification are independent. This test can be used since both variables are categorical with at least two levels. Also, they are frequency data rather than score data. Chi-squared statistics were computed for contingency table 2×3 (time period × preference (boy/girl)/ no preference). However, this statistic indicates only whether or not the variables are associated and give little information on which specific cells appear to influence the outcome observed. The examination of standardized residuals helps to determine which cells most strongly influence chi-squared value. (A standardized residual is a value similar to a *z* statistic. It is a difference between the observed and expected value divided by the square root

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Table 1. Preference for sex of child by first-time-pregnant women in the last 50 years

Authors	Year	Sample size	No preference	Preference for a girl (1)	Preference for a boy (2)	Girl (1)/ Boy (2) ratio
Dahlberg	1948	425	144 (34%)	153 (36%)	128 (30%)	1.20
Stattin & Klackenberg-Larsson	1991[a]	77	12 (16%)	38 (49%)	27 (35%)	1.41
Uddenberg *et al.*	1971	81	18 (22%)	26 (32%)	37 (46%)	0.70
Kruk	1981[b]	41	14 (34%)	9 (22%)	18 (44%)	0.50
Zajicek	1981[b]	96	56 (58%)	21 (22%)	19 (20%)	1.11
Kruegel	1975	86	34 (40%)	19 (22%)	33 (38%)	0.58
Oakley	1978	56	14 (25%)	12 (22%)	30 (53%)	0.40
Leifer	1980	19	3 (16%)	2 (11%)	14 (74%)	0.14
Pharis & Manosevitz	1980	25	12 (48%)	5 (20%)	8 (32%)	0.63
Saucier	1982	33	18 (55%)	9 (27%)	6 (18%)	1.50
Steinbacher & Gilroy	1985	140	82 (59%)	33 (24%)	25 (18%)	1.32
Choi	1986	20	8 (40%)	1 (5%)	11 (55%)	0.09
Teichman *et al.*	1992	97	37 (38%)	32 (34%)	28 (28%)	1.14
Walker	1992	22	—	15 (68%)	7 (32%)	2.14
Walker & Conner	1993	65	16 (25%)	28 (43%)	21 (32%)	1.33
Marleau *et al.*	1996	226	89 (39%)	88 (39%)	49 (22%)	1.80
Total	1948–1996	1509	557 (36%)	491 (33%)	461 (31%)	1.07
	1948–1980	906	307 (34%)	285 (31%)	314 (35%)	0.91
	1981–1996	603	250 (41%)	206 (34%)	147 (24%)	1.40

[a]The maternal preference in this study was obtained between 1955 and 1958.
[b]These studies were done in 1974.

of the expected value.) A standardized residual (*SR*) greater than 2 in absolute value is usually considered a major contributor (Pett, 1997).

Results

For first-time-pregnant women, the data in nine of the sixteen studies indicate a greater preference for a girl (Table 1). Furthermore, when the 1948–1996 segment is divided into two sub-periods (thus giving a table of six cells), the girl/boy ratio is always higher than 1·0 in the most recent sub-period (1981–1996), except in Choi's (1986) sample composed of Korean–American women. The data reveal a difference between the two sub-periods. The mean ratio for the first sub-period is 0·91 (nine studies), and 1·40 (seven studies) for the second sub-period (see the bottom of Table 1). The difference between the two sub-periods is due principally to a decline in the preference for a boy as the first-born (a difference of 11%) and to the fact that the 'no preference' category increases from 34% in 1948–1980 to 41% in 1981–1996. The results of the chi-square test indicate a significant association between time period and the choice of women ($\chi^2 = 20{\cdot}69$, df = 2, $p = 0.000$). Further,

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Table 2. Preference for sex of child by partner of first-time-pregnant women in the last 50 years

Authors	Year	Sample size	No preference	Preference for a girl (1)	Preference for a boy (2)	Girl (1)/ Boy (2) ratio
Dahlberg	1948	425	128 (30%)	89 (21%)	208 (49%)	0.43
Stattin & Klackenberg-Larsson	1991	77	15 (20%)	23 (30%)	39 (50%)	0.59
Uddenberg *et al.*	1971	81	12 (15%)	17 (21%)	52 (64%)	0.33
Pharis & Manosevitz	1980	25	11 (44%)	5 (20%)	9 (36%)	0.56
Entwisle & Doering	1981	120	19 (16%)	16 (13%)	85 (71%)	0.19
Saucier	1982	33	17 (50%)	7 (22%)	9 (28%)	0.78
Walker & Conner	1993	65	14 (22%)	21 (32%)	30 (46%)	0.70
Saucier	1996	234	82 (35%)	82 (35%)	70 (30%)	1.17
Total	1948–1996	1060	299 (28%)	260 (25%)	501 (47%)	0.52
	1948–1980	608	167 (27%)	134 (22%)	307 (51%)	0.44
	1981–1996	452	132 (29%)	126 (28%)	194 (43%)	0.65

examination of standardized residuals indicates that only two cells of six are major contributors to chi-square statistics; women interviewed in the first period ($SR = 2.4$) were significantly more likely than women interviewed in the second period ($SR = 2.9$) to prefer a boy.

In contrast, the data concerning the preference of expectant fathers (Table 2) indicate, in seven out of eight samples, a preference for a boy. When the data are collapsed, 47% prefer a boy, and 25% a girl. The ratio is 0·52 indicating a strong preference for a boy. If, as above, the 1948–1996 period is divided into the same two sub-periods, it is observed that, though the mean ratio increases from 0·44 (1948–1980; four studies) to 0·65 (1981–1996; four studies), it remains well below 1, indicating a strong preference for a boy as the first-born child. The data indicate that the boy-first preference decreases by 8%, and the girl-first preference increases by 6%. The chi-square statistic is significant ($\chi^2 = 7.79$, df = 2, $p = 0.02$). The examination of standardized residuals indicates that here no cell influences unduly the chi-square statistic.

When the above two tables are compared, the mean ratios of pregnant women and expectant fathers follow the same trend: they both increase from the first to the second sub-period. The data also indicate that, while there is a decrease in the boy-first preference of both men and women, the percentage of men desiring a boy as the first-born child in the second sub-period is higher than that of women (43% vs 24%). Lastly, the percentage of women who select 'no preference' increases in the second sub-period (from 34% to 41%), whereas there is no change in the percentage for men (27% and 29%).

Is the men's preference similar regardless of whether the information is provided by their pregnant wives (five studies) or by men themselves (three studies)? Table 3

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Table 3. Paternal preference for sex of child obtained from the spouses vs the men themselves

Information from	Sample size	No preference	Preference for a girl (1)	Preference for a boy (2)	Girl (1)/ Boy (2) ratio
Spouses	882	252 (29%)	232 (26%)	398 (45%)	0.58
Men themselves	178	47 (26%)	28 (16%)	103 (58%)	0.27

shows a difference: compared with men, women have a tendency to inflate somewhat the preference for girls and to deflate preference for boys. Thus, it is important to know exactly who the informant is. The result of the chi-square test is significant ($\chi^2 = 12{\cdot}15$, df = 2, $p = 0.002$). Further, the standardized residuals clearly show that men were significantly more likely than women were themselves to desire a boy ($SR = 2.4$) and less likely to desire a girl ($SR = 2.1$).

The above data can be compared with those from non-pregnant women. Since the first table shows a significant change over time, the studies of non-pregnant women were also divided into two sub-periods, namely 1954–1980 (eight studies) and 1981–1993 (four studies). The results are given in Table 4. Though the girl/boy ratio increases from the first (0·30) to the second sub-period (0·69), it remains below the threshold of 1·0. The chi-square statistic is again significant ($\chi^2 = 209{\cdot}34$, df = 2, $p = 0.000$), indicating an association between the time period and the non-pregnant women's preference. All the standardized residuals are higher than 2, indicating that all cells contribute to the chi-square statistic: the data show an increase in the percentages for 'no preference' and preference for a girl, and a radical decrease in preference for a boy (from 52% to 31%).

The data concerning men not living with a pregnant woman show that, while the ratio also increases significantly, it is still lower than 1·0, indicating a strong boy-first preference (Table 5). This is a significant result ($\chi^2 = 24{\cdot}19$, df = 2, $p = 0.000$). Examination of residuals showed that men from the first period ($SR = 2.2$) are more likely than men from the second period ($SR = 3.0$) to choose the 'no preference' category; the percentage decreases from 29% to 18%. Also, men from the second period ($SR = 2.4$) are more likely than men from the first period to desire a girl.

Does it make a difference to sex preference among non-pregnant women if the subjects are from college samples (eight studies) or from fertility surveys (two studies), since fertility survey subjects are usually married and older than college subjects? The results are given in Table 6. The chi-square test is significant ($\chi^2 = 228{\cdot}35$, df = 2, $p = 0.000$). Further, standardized residuals reveal that women from fertility surveys are more likely to choose the 'no preference' category ($SR = 7.5$) and less likely to prefer a boy ($SR = 7.1$) than younger college women. It should be noted that a similar comparison with regard to men not living with pregnant women cannot be made since they are rarely questioned about sex preference in fertility surveys.

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Table 4. Preference for sex of child by non-pregnant women in the last 45 years

Authors	Year	Sample size	No preference	Preference for a girl (1)	Preference for a boy (2)	Girl (1)/ Boy (2) ratio
Dinitz *et al.*	1954	195	69 (35%)	12 (6%)	114 (59%)	0.11
Goodenought	1957[a]	40	23 (57%)	3 (8%)	14 (35%)	0.21
Markle & Nam	1971	165	15 (9%)	20 (12%)	130 (79%)	0.15
Peterson & Peterson	1973	157	45 (29%)	10 (6%)	102 (65%)	0.10
Markle	1974	65	29 (45%)	3 (5%)	33 (51%)	0.09
Markle	1974[b]	79	15 (19%)	4 (5%)	60 (76%)	0.07
Markle	1974[c]	74	29 (39%)	19 (26%)	26 (35%)	0.73
Norman	1974	169	72 (43%)	18 (11%)	79 (47%)	0.23
Rent & Rent	1977	363	156 (43%)	22 (6%)	185 (51%)	0.12
Goldfarb	1988[d]	220	15 (7%)	81 (37%)	123 (56%)	0.66
Pebley & Westoff	1982[e]	554	188 (34%)	100 (18%)	266 (48%)	0.38
Pebley & Westoff	1982[f]	676	230 (34%)	135 (20%)	311 (46%)	0.43
Gilroy & Steinbacher	1983	139	64 (46%)	22 (16%)	53 (38%)	0.42
Goldfarb	1988[g]	369	22 (6%)	144 (39%)	203 (55%)	0.71
Steinbacher & Gilroy	1990	179	67 (37%)	43 (24%)	69 (39%)	0.62
Marleau & Saucier	1993	1290	796 (62%)	209 (16%)	285 (22%)	0.73
Total	1954–1993	4734	1835 (39%)	845 (18%)	2053 (43%)	0.41
	1954–1982	2757	886 (32%)	427 (16%)	1443 (52%)	0.30
	1983–1993	1977	949 (48%)	418 (21%)	610 (31%)	0.69

[a]These women already had a child.
[b]Women who already had a boy as a first-born child.
[c]Women who already had a girl as a first-born child.
[d]These data come from a sample collected in 1978.
[e]Data are from the 1970 National Fertility Survey.
[f]Data are from the 1975 National Fertility Survey.
[g]These data come from sample collected in 1983, 1985 and 1986.

Since so many studies with non-pregnant women have been conducted with college students, it could be argued that the differences noted above (Tables 1 and 4) are not due to non-pregnancy/pregnancy, but to the younger age of the subjects. This hypothesis was tested by using the community sample of 234 first-time-pregnant women (for more details see Marleau *et al.*, 1996). The sample was divided into five age groups: 19–24, 25–29, 30–34, 35–39 and 40–49. As Table 7 shows, the five groups show no difference with regard to sex preference ($\chi^2 = 10{\cdot}43$, df = 8, ns). The same results have been obtained by Uddenberg *et al.* (1971) and Steinbacher & Gilroy (1985, 1990). This supports the hypothesis that it is in fact the non-pregnancy/ pregnancy status that makes the crucial difference.

Discussion

The data clearly show that in the last 15 years first-time-pregnant women clearly preferred a girl as their first child (on the basis of a mean girl/boy ratio of 1·40 as

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Table 5. Preference for sex of child by men not living with a pregnant women in the last 45 years

Authors	Year	Sample size	No preference	Preference for a girl (1)	Preference for a boy (2)	Girl (1)/ Boy (2) ratio
Dinitz *et al.*	1954	185	62 (34%)	8 (4%)	115 (62%)	0.07
Goodenought	1957[a]	40	13 (32%)	0 (0%)	27 (68%)	0.00
Markle & Nam	1971	118	19 (16%)	5 (4%)	94 (80%)	0.05
Peterson & Peterson	1973	105	39 (37%)	6 (6%)	60 (57%)	0.10
Markle	1974	82	39 (48%)	1 (1%)	42 (51%)	0.02
Markle	1974[b]	62	17 (27%)	1 (2%)	44 (71%)	0.02
Markle	1974[c]	51	17 (33%)	17 (33%)	17 (33%)	1.00
Norman	1974	155	74 (48%)	8 (5%)	73 (47%)	0.11
Goldfarb	1988[d]	224	18 (8%)	47 (21%)	159 (71%)	0.30
Gilroy & Steinbacher	1983	97	46 (47%)	6 (7%)	45 (46%)	0.13
Goldfarb	1988[e]	356	21 (6%)	68 (19%)	267 (75%)	0.25
Steinbacher & Gilroy	1990	102	35 (34%)	8 (8%)	59 (58%)	0.14
Total	1954–1990	1577	400 (25%)	175 (11%)	1002 (64%)	0.17
	1954–1974	1022	298 (29%)	93 (9%)	631 (62%)	0.15
	1983–1990	555	102 (18%)	82 (15%)	371 (67%)	0.22

[a]These women already had a child.
[b]Women who already had a boy as a first-born child.
[c]Women who already had a girl as a first-born child.
[d]These data come from a sample collected in 1978.
[e]These data come from samples collected in 1983, 1985 and 1986.

Table 6. Preference for sex of child according to the type of sample: student population vs population survey

Type of sample	Sample size	No preference	Preference for a girl (1)	Preference for a boy (2)	Girl (1)/ Boy (2) ratio
Student sample	2174	609 (28%)	391 (18%)	1174 (54%)	0.33
Fertility studies	2520	1210 (48%)	454 (18%)	857 (34%)	0.53

compared with a lower girl/boy ratio of 0·91 found in pre-1980 studies). Also, Marleau & Maheu (1998) have shown that women, in the last decade, more often prefer a girl to a boy when forced to select the sex of a hypothetical only-child that they could have in their life. Thus, the claim that a boy is universally preferred as the first child in Western societies is now obsolete.

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Table 7. Preference of first-time-pregnant women according to age*

Age	Sample size	No preference	Preference for a girl (1)	Preference for a boy (2)	Girl (1)/ Boy (2) ratio
19–24	34	10 (29%)	15 (44%)	9 (27%)	1.67
25–29	106	52 (49%)	36 (34%)	18 (17%)	2.00
30–34	63	21 (33%)	26 (41%)	16 (25%)	1.63
35–39	19	5 (26%)	10 (53%)	4 (21%)	2.50
40–49	4	1 (25%)	1 (25%)	2 (50%)	0.50
Total	226	88 (39%)	88 (39%)	49 (22%)	1.80

*$\chi^2 = 10.43$, df = 8, ns.

However, non-pregnant women (college students for the most part) still tend to prefer a boy. One might think that the age difference between the two samples would account for this discrepancy, but verification with the current sample of 234 first-time-pregnant women does not support this idea (Table 7). Is it the result of the difference between a real-life situation and hypothetical one? It would appear that there is something specific about being pregnant or just before being pregnant that makes women change their mind about sex preference. This is also confirmed with the second-time-pregnant women in the community sample (Saucier, 1996). Asked about their sex preference for the coming second child, 44% indicated a preference for a girl, and only 17% said they would prefer a boy. This finding yields a girl/boy ratio of 2·59, which is higher than that for the first child (1·80, as indicated by Marleau *et al.*, 1996, in Table 1). More specifically, among women who had a boy as their first child, 10% wished to have another boy for a second child, whereas among women who had a girl as their first child, 24% (almost two and a half times more) wanted to have another girl as their second child. All these data confirm the trend towards a higher girl/boy ratio in preference among pregnant women, and suggests that something about being pregnant incites women to prefer a girl more often than a boy as their first child. More research is needed to understand this intriguing difference.

Although there is a clear trend among first-time-pregnant women, more research is needed to investigate the impact of the timing of the interview during pregnancy. In the present survey, for example, the women were interviewed around the 16th week, whereas in some surveys they were interviewed at a later stage. A similar investigation should be conducted with expectant fathers. However, whatever the timing, it is better that none of the interviewees be aware of the results of amniocentesis or an ultrasound examination. It is well known that knowledge of these results not only sometimes changes sex preference, but for some subjects can even lead to a denial of a previously held sex preference.

According to D. Filiatreault (personal communication) the routine practice in Western countries of an ultrasound examination during pregnancy started in the years 1978–1983, i.e. around the beginning of the second period (1981–1996) in this survey. Now, during pregnancy, even if the information about the sex of the fetus is available,

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not all parents wish to obtain it; according to Villeneuve *et al*. (1988) and Filiatreault (2000), between 25% and 50% of parents prefer *not* to ask for it. Finally, the percentage of error about identification of the sex of the fetus, especially for female ones, varies between 1% and 4%.

Not knowing the results of an ultrasound examination or amniocentesis (a less-frequent procedure most often limited to pregnant women aged 35 years or more), as far as the sex of the fetus is concerned, is better for obtaining the true sex preference of parents. Since none of the studies (except the current one) published since 1981 has mentioned whether or not the parents had been aware of the results of an ultrasound examination, the question now is whether the routine practice of ultrasound has significantly influenced sex preference in a specific direction, so much so that the second period (1981–1996) cannot validly be compared with the first period (1948–1980) in this study.

For all the women who go through the ultrasound examination and their husbands, there is first the group of between 25% and 50% who do not want to know the sex of the fetus; for these, there is no possible change in their sex preference. Second, for the remainder of the parents who do receive this information, in about half this information will coincide with their sex preference just because of chance. Third, for the other half, where there is a discrepancy between the information and the sex preference, an unknown percentage will change their sex preference. However, it is most likely that as many of the parents who have a discrepancy between the information of a boy and a sex preference for a girl will change their sex preference as the other group of parents, who will have the discrepancy between the information of a girl and a sex preference for a boy. The end result for the percentage of sex preference is thus likely to be about the same, which means that the two periods can be validly compared.

It would also be useful to compare men's sex preferences such as they report them themselves and as they are reported by their spouses. Indeed, the data suggest that there is a difference between the two partners: women have a tendency to inflate the preference for a girl when reporting their spouse's preference.

Why would women prefer a daughter as their first child? Some authors have investigated the reason why women prefer having a daughter in general. It might be due to the change in the social status of women in Western society over the past 30 years, as argued by Norman (1974), Pharis & Manosevitz (1984), Steinbacher & Gilroy (1985) and Pooler (1991). Hoffman & Hoffman (1973) argue that women prefer daughters because they can have a better relationship with them than with a son. Other reasons given by women are that girls are easier to raise, they can be helpful and will grow up to look like their mothers. Williamson (1976a) presents some psychological, social and economic hypotheses. Parents consider daughters as easier to raise or believe that a daughter will be a rewarding companion or helper, whether as a child or an adult. She also puts forward the hypothesis that in matrilinear kinship systems parents prefer a daughter in order to carry on the family line. Pooler (1991), with a sample in which 80% of female students agreed with the idea that women should retain their own name after marriage, suggests that some women prefer an only child to be a daughter in order to carry on their own name and thereby ensure their immortality, as men did in previous centuries. He writes that 'these college

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women believe women can marry, have children, and still maintain a sense of self' (Pooler, 1991, p. 574).

In another context, Teichman, Rabinovitz & Rabinovitz (1992) suggest that Israeli women prefer daughters because boys are more at risk in a society which has been in a constant state of war for the past 50 years (Peterson & Peterson, 1973). While this explanation might be true in Israel, this hypothesis would not apply to most Western countries since they are not constantly at war.

The above hypotheses, proposed by researchers, were not specifically formulated in the context of a first child. To the authors' knowledge, there has been only one study in which the subjects themselves were directly asked about their reasons for preferring a daughter rather than a son (Fidell *et al*., 1979); these subjects were not pregnant women, but male and female undergraduate students. The three leading reasons given by that sample of students were: 'to provide an easy child to rear', 'to help care for a younger sibling' and 'to provide instruction for a younger sibling'. Unfortunately, the authors did not report separate data for female and male subjects.

In recent decades, with the emergence of the expectation that the future would hold the technical possibility of sex selection, many authors have expressed the concern that this tendency could result in a very high boy/girl ratio for first-born children (Markle, 1974; Pebley & Westoff, 1982; Steinbacher, 1980; Westoff & Rindfuss, 1974). In fact, Gilroy & Steinbacher (1983, 1991) and Steinbacher & Gilroy (1990) indicated that the majority of students who would use sex technology preferred a boy rather than a girl. Interestingly, their data with pregnant women showed that of those who would have used sex pre-selection techniques, 50% desire a boy and 50% desire a girl. Others have suggested that first-born characteristics (e.g. first-borns tend to be high achievers) would be carried by more boys than by girls, and that girls would probably be locked into a second-class social status (Campbell, 1976; Hartley & Pietraczyk, 1979; Steinbacher, 1980; Walter, 1975; Wiegle, 1985; Williamson, 1976b, 1978). In light of these findings about pregnant women, there seems to be no need for concern about the possibility of boys dominating as first-born children. Moreover, in the view of some authors, many individuals will not want to use this technology when it becomes available (Adelman & Rosenzweig, 1978; Dixon & Levy, 1985; Largey, 1972) or disagree with the idea of choosing the sex of their children (Baluch, Fallone & Khan, 1994; Green, Wray & Baluch, 1993); if they do use it, it will only be for the second or third child, in order to have a child whose sex is different from the previous ones (Adelman & Rosenzweig, 1978; Rosenzweig & Adelman, 1976). Rent & Rent (1977) declare that 'if the sexes were considered equal in terms of potential for excelling and making salient and worthwhile contribution to society . . . sex control would then probably become important only with the second child . . .'

As has been stressed by Goodkind (1999), sex preference is mostly influenced by culture; these findings covering the period 1948–1996 show that Western culture is in the middle of a process of gradual change as far as the sex preference of a first child is concerned. But it does not appear that this recent change in culture in the direction of girl preference would be likely to become as extreme as the boy preference seen for centuries in Asian countries, or to lead to male sex discrimination (or to boy infanticide), as has sometimes been observed in these countries for the other sex.

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More research is needed to investigate whether individuals who decide whether or not to use sex pre-selection technology will change their minds when the desire to have children is more salient (longitudinal studies). Also, the data concerning pregnant women and expectant men indicate that their preferences for a first child diverge, suggesting conflict between partners (see also Marleau & Maheu, 1998). Research is also needed to investigate whether the differences in desired sex of the first child are associated with psychosocial outcomes such as marital difficulties, depression, conflictual relationship with the infant and so on.

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