The Effects of Sibling Structure on Fertility Decisions from the Perspectives of Son Preference and Family Resources in Taiwan

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Introduction

- Based on the theories of **son preference** and **family resources**, this study constructed **a sequential fertility decision-making model** and analyzed **the sibling structure of earlier born children** to examine the probability that parents would decide to have another child.

- This study proposed three sets of hypotheses to explore effects exerted by **the sex of the first child**, **sex balance, or son preference**, and **the preference to have sons or invest in sons**.

□ This study analyzed data retrieved from the **Panel Study of Family Dynamics (PSFD)** in Taiwan.

- The birth years of the respondents ranged from 1934 to 1986.

- This study **examined the fertility decisions made by the parents of the respondents**.

- The **results can facilitate research into siblings** in Taiwan.

The preference toward having sons

□ Earlier studies have proven that **Taiwanese society has a strong preference for sons**, which is **manifested in parents' fertility actions** (Williamson, 1976).

□ This study first examined the influence of **the modernization process on the sibling structure** in Taiwanese families from the perspective of demographic structural change.

Table 1. Total number of births and TFR for women of childbearing age in Taiwan

| Year | Number of births | | | | | CBR crude birth rate | TFR total fertility rate |
| | Total | Male | | Female | | (‰) | (‰) |
		Number	(%)	Number	(%)		
1951	385,383	197,297	51.20	188,086	48.80	49.97	7,040
1961	420,254	216,728	51.57	203,526	48.43	38.33	5,585
1971	380,424	195,938	51.51	184,486	48.49	25.67	3,705
1981	414,069	213,948	51.67	200,121	48.33	22.97	2,455
1982	405,263	209,457	51.68	195,806	48.32	22.08	2,320
1983	383,439	198,240	51.70	185,199	48.30	20.56	2,170
1984	371,008	192,034	51.76	178,974	48.24	19.60	2,055
1985	346,208	178,336	51.51	167,872	48.49	18.04	1,880
1986	309,230	160,226	51.81	149,004	48.19	15.93	1,680
1987	314,024	163,331	52.01	150,693	47.99	16.01	1,700
1988	342,031	177,687	51.95	164,344	48.05	17.24	1,855
1989	315,299	164,147	52.06	151,152	47.94	15.72	1,680
1990	335,618	176,029	52.45	159,589	47.55	16.55	1,810
1991	321,932	168,865	52.45	153,067	47.55	15.70	1,720
1992	321,632	168,488	52.39	153,144	47.61	15.53	1,730
1993	325,613	169,486	52.05	156,127	47.95	15.58	1,760
1994	322,938	168,444	52.16	154,494	47.84	15.31	1,755
1995	329,581	171,118	51.92	158,463	48.08	15.50	1,775
1996	325,545	169,484	52.06	156,061	47.94	15.18	1,760
1997	326,002	170,047	52.16	155,955	47.84	15.07	1,770
1998	271,450	141,462	52.11	129,988	47.89	12.43	1,465
1999	283,661	148,042	52.19	135,619	47.81	12.89	1,555
2000	305,312	159,726	52.32	145,586	47.68	13.76	1,680
2001	260,354	135,596	52.08	124,758	47.92	11.65	1,400
2002	247,530	129,537	52.33	117,993	47.67	11.02	1,340
2003	227,070	118,984	52.40	108,086	47.60	10.06	1,235
2004	216,419	113,639	52.51	102,780	47.49	9.56	1,180
2005	205,854	107,378	52.16	98,476	47.84	9.06	1,115
2006	204,459	106,936	52.30	97,523	47.70	8.96	1,115
2007	204,414	106,898	52.29	97,516	47.71	8.92	1,100
2008	198,733	103,937	52.30	94,796	47.70	8.64	1,050
2009	191,310	99,492	52.01	91,818	47.99	8.29	1,030
2010	166,886	87,213	52.26	79,673	47.74	7.21	895

❑ Changes in the sibling structure can be observed from the birth rate and the fertility rate.

- The number of children born to a Taiwanese woman **in 1950 was 7**. However, since **1984**, the TFR **has been below the replacement level of 2.1** and decreased to **0.9 in 2010**, showing **a demographic change of birth rate decline**.

- However, **the total number and birth rate of male births consistently exceeded the female** and remained at a stable level of 51% to 52%, indicating **the influence exerted by the preference toward having sons**.

Table 2. Sex ratio at birth

Year	Total	Birth order				
		1	2	3	4	5+
1987	**108.37**	107.24	108.24	110.19	113.66	109.84
1988	**108.20**	107.30	106.88	111.60	111.47	117.98
1989	**108.61**	107.02	106.95	113.31	120.58	116.26
1990	**110.29**	106.79	108.68	118.74	128.48	126.71
1991	**110.45**	107.41	108.50	118.17	129.49	124.39
1992	**109.93**	108.04	107.52	115.96	129.70	123.51
1993	**108.12**	107.13	106.68	110.83	121.12	121.19
1994	**108.88**	107.84	107.32	112.90	119.78	117.75
1995	**107.91**	107.04	105.52	112.35	124.22	126.76
1996	**108.76**	107.91	106.98	112.46	120.52	122.29
1997	**108.91**	107.72	106.93	113.62	125.55	120.36
1998	**108.73**	107.01	106.83	114.60	126.61	120.97
1999	**109.47**	106.88	107.80	118.38	134.23	132.68
2000	**109.45**	106.87	107.68	118.94	135.02	120.16
2001	**108.70**	106.88	105.79	120.82	134.98	121.19
2002	**109.80**	106.89	109.08	121.50	138.68	122.97
2003	**110.15**	107.66	108.91	123.58	139.69	122.17
2004	**110.66**	108.73	109.42	122.59	134.15	122.82
2005	**109.04**	107.71	107.07	122.03	124.29	121.91
2006	**109.61**	107.24	108.17	126.42	136.63	111.33
2007	**109.71**	107.88	108.91	123.36	120.04	112.16
2008	**109.66**	108.59	108.40	120.27	121.92	112.02
2009	**108.42**	106.66	107.60	122.92	125.60	101.77
2010	**108.96**	106.37	109.58	119.31	129.10	112.84

Note: Data source: Department of Statistics, Ministry of the Interior (2011)

A sex-unbalanced sibling structure.

- In Taiwan, **the sex ratio at birth is typically 104 to 106** newborn boys for every 100 girls.

- The data show that the ratio in Taiwan **has exceeded 106 since 1987**.

- In particular, **the ratio at low birth orders is relatively high** and only becomes lower at the fifth and successive birth orders.

- This indicated that although the number of male and female births declined annually, **the sex ratio at birth still remained unbalanced even in 2010**, leading to a sex-unbalanced sibling structure.

The preference to invest in sons

- Although parents may imagine having an ideal number of children or children of a particular sex, **continuing to produce children until their goals are achieved is not feasible**.

  - **One more newborn child also implies one more person consuming family resources**. Thus, resource dilution is a constraint that parents encounter when making fertility decisions.

  - In particular, **the number of male siblings exerts a significant resource dilution effect** (Mott & Haurin, 1982; Powell & Steelman, 1989; Butcher & Anne, 1994).

Two opposite effects

☐ Parents may intend to have sons, representing a "**preference toward bearing sons**," and parents may also invest more resources in sons, which is a "**preference to invest in sons**."

- However, these two types of preferences **may exert opposite influences on fertility decisions**.

- The expectation to have sons **prompts** couples to produce another child, whereas the demand of a amount of resources for nurturing sons may **hinder** couples from continuing to have children.

- Thus, the objective of this study was to **examine the influence of the sibling structure on the probability that parents will have another child**.
  - Specifically, **when parents have had one, two, or three children, the sex composition and birth order of the existing children form a specific sibling structure**, which can reflect whether the expectation of having sons has been fulfilled as well as the amount of family resources required to be spent.

Research Structure

Family background variables
(control variables)
1. Ethnicity
2. Family socioeconomic background

Variables of personal attributes
(control variables)
1. Birth cohort
2. Maternal age at the first, second and third childbirth

Sibling variables
1. Sex of the first child
2. The sibling structure of the first two children
3. The sibling structure of the first three children

n>1 (at least 2 children)

n>2 (at least 3 children)

n>3 (at least 4 children)

(n denotes the number of children born to the respondents' parents)

Research Analysis

- Table 3. Logistic regression analysis for the influence of sibling structure on fertility decision making
  - Model 1: **The effects of the sex of the first child** on having another child.
  - Model 2: **The effects of the sibling structure of the first two children** on having another child.
  - Model 3: **The effects of the sibling structure of the first three children** on having another child.

n > 1

Number of Children (n)	Model 1 (n> 1)		
	B	p	Exp(B)
Ethnicity			
Hakka	-0.259		0.772
Mainlanders	-1.168	*	0.311
Aborigines	-0.746		0.474
Family background			
Fathers' years of education	-0.040		0.961
Mothers' years of education	0.068		1.070
Fathers' occupational prestige	0.009		1.009
Birth cohort			
After 1969	-0.466		0.628
Maternal age at childbirth			
Age at first childbirth	-0.166	**	0.847
Age at second child birth	----		----
Female first birth	0.685		1.983
Constant	7.696***		
-2 LL	332.909		
N	2074		

n > 2

Number of Children	Model 2A (n> 2)			Model 2B (n> 2)			Model 2C (n> 2)			Model 2D (n> 2)		
	B	p	Exp(B)	B	p	Exp(B)	B	p	Exp(B)	B	p	Exp(B)
First two children of same sex	0.069		1.072	----		----	----		----	----		----
Sibling structure of first two children 01 (Control group: different sex)												
F-F	----		----	0.544 *		1.722	----		----	----		----
M-M	----		----	-0.298		0.742	----		----	----		----
Sibling structure of first two children 02 (control group: M-M)												
F-F	----		----	----		----	0.84 **		2.322	----		----
F-M	----		----	----		----	0.23		1.258	----		----
M-F	----		----	----		----	0.36		1.443	----		----
Sibling structure of first two children 03 (control group: F-F)												
M-M	----		----	----		----	----		----	-0.843 **		0.431
F-M	----		----	----		----	----		----	-0.613 *		0.542
M-F	----		----	----		----	----		----	-0.476 *		0.621
Constant	7.459***			7.458***			7.164***			8.006***		
-2 LL	894.541			883.236			882.961			882.961		
N	1901			1901			1901			1901		

Number of Children (n)	Model 3A (n> 3)			Model 3B (n> 3)			Model 3C (n> 3)			Model 3D (n> 3)		
	B	p	Exp(B)	B	p	Exp(B)	B	p	Exp(B)	B	p	Exp(B)
First three children of same sex	0.399 *		1.491	----		----	----		----	----		----
Sibling structure of first three children 01 (control group: different sex)												
F-F-F	----	----		1.500 ***		4.482	----	----		----		----
M-M-M	----	----		-0.476 *		0.622	----	----		----		----
Sibling structure of first three children 02 (control group: M-M-M)												
F-F-F	----	----		----		----	2.045 ***		7.732	----		----
F-F-M	----	----		----		----	1.176 ***		3.242	----		----
F-M-F	----	----		----		----	1.223 ***		3.397	----		----
F-M-M	----	----		----		----	-0.012		0.988	----		----
M-M-F	----	----		----		----	-0.039		0.962	----		----
M-F-M	----	----		----		----	-0.144		0.865	----		----
M-F-F	----	----		----		----	1.073 ***		2.925	----		----
Sibling structure of first three children 03 (control group: F-F-F)												
M-M-M	----	----		----	----		----	----		-2.045 ***		0.129
F-F-M	----	----		----	----		----	----		-0.869 **		0.419
F-M-F	----	----		----	----		----	----		-0.822 *		0.439
F-M-M	----	----		----	----		----	----		-2.057 ***		0.128
M-M-F	----	----		----	----		----	----		-2.085 ***		0.124
M-F-M	----	----		----	----		----	----		-2.190 ***		0.112
M-F-F	----	----		----	----		----	----		-0.972 **		0.398
Constant	6.175***			6.271***			6.001***			8.046***		
-2 LL	1305.537			1264.133			1210.273			1210.473		
N	1647			1647			1647			1647		

Research Results

□ First, **the effect of the sibling structure was verified**.

■ The decision to have a third child was influenced by the two earlier born children. Parents who had had two girls showed a higher probability of having a third child.

■ Similarly, the decision of having a fourth child was influenced by the first three children. When the sibling structure involved more girls than boys or all girls, parents had a higher probability of having another child.

■ Therefore, **fertility decisions were influenced by the sex composition and birth order of several children**.

□ Second, the hypothesis of sex balance was rejected, whereas **the hypothesis of son preference was accepted**.

- The sibling structure of two or three children of the same sex did not influence parents to have a significantly high probability of having another child.

- However, **when parents faced the choice of having a third or fourth child, they exhibited a higher probability of having another child if they only had daughters, compared with parents who only had sons**.

- Therefore, the son preference hypothesis was verified.

- Third, **the preference to have sons and the preference to invest in sons exerted opposite influences on fertility decisions**.

  - **As the number of sons increased, the probability that parents would have another child decreased**.

  - The result showed that when parents only had two children, the influences of son preference and family resources were insignificant.

  - However, **when parents had three children or more**, involving at least one son, the probability of having another child decreased.

- In particular, **sibling structures involving two boys had the strongest negative influence** on the probability to have subsequent children. In other words, **the satisfied point for parents' fertility decisions was bearing two sons**.

- Under the opposite effects of preferring to have sons and preferring to invest in sons, **when parents' preference of having sons was satisfied, the probability that they would continue to have children accordingly decreased**.

□ Lastly, the research result supported the idea that **fertility decision-making in Taiwanese families is a sequential process**.

  ■ Parents decide whether to have another child after determining **whether their expectation of having sons has been satisfied** and **the family resources that are available**. Consequently, the sequential fertility decision-making model was verified.

- In summation, having children served originally a reproductive function for people to produce the next generation, and the family and sibling structures were only the results of probability. In this study, **I depicted the process by which family and sibling structures were granted specific social meanings and regarded as essential cultural systems in Taiwanese families**.

THE END

Thank you for your attention!