

THE TIMING OF BIRTHS AND BIRTH INTERVALS IN RELATION TO MARRIAGE, TAIWAN, 1951-1971

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Introduction

Much has been told about the fertility decline in Taiwan. Factors associated with this phenomenon mentioned most often include the decrease of the preferred number of children, high rate of birth control use, favorable social condition because of rapid socioeconomic development, and strong government policy together with organized efforts in promoting family planning. Yet some traditional values persist amid the process of social change. In the meantime, widespread use of contraception in Taiwan up to now, as evidenced by a current practice rate of 65%, seems not to be able to guarantee a continuous decline in fertility at the similar pace experienced in the past one and half decades, due to the following reasons:

1. Son preference still deep-rooted in all social strata;
2. Relatively large family size desired;
3. Rather late adoption of contraception;
4. Spacing among family planners still a minority;
5. Extraordinarily high fertility among some young wives;
6. Weak cooperation from government agencies other than health; and
7. Very little effective social measures to reduce fertility.

A group of demographers/sociologists have been very successful in documenting the changes of the first three problems above, while the last two fall into a category not specifically related to academic research. The present paper thus tries to look into the long-neglected two problems in the middle through the analysis of the timing of births and the trend of birth intervals in relation to marriage in Taiwan during the period from 1951 to 1971 by using data obtained from two independent sample surveys, known as the KAP-IV and VOC study, conducted by the Taiwan Provincial Institute of Family Planning in 1973 and 1976, respectively.

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The data

The Taiwan KAP-IV survey include women aged 20 to 39 who were currently married and living with their spouses in non-aboriginal areas of the Island. The sample of 5,979 women was selected through a multi-stage equal probability sample. Personal interviews were conducted during the period from June through November, 1976, resulting in a total of 5,588 valid cases. The case base is 4,913 in this analysis, consisting of records of women having at least one live birth, date of first marriage determined, and not married more than once.

VOC study is the second phase of Taiwan part of an international comparative study project supported by the Rockefeller and Ford Foundations. Personal interviews were conducted in early 1976, including three types of sample. They are 2,389 wives, 1,128 husbands, and 691 mothers-in-law. The present analysis include only the first sample of women having at least one birth, date of first marriage determined, and not married more than once. The case base is 1,628.

In order to determine the timing of births and birth intervals in relation to marriage, four values were calculated, namely: age at first marriage in completed years, duration of marriage at birth in months, intervals between births in months, and age at birth in completed years. For the first birth interval and the duration of marriage at first birth, the length of time between date of marriage and date of first birth. All these values were calculated only up to the third birth. On the one hand, to limit our analysis up to the third birth bears policy implication, because by 1976 according to VOC study, the mean preferred number of children has fallen to 2.7 for wives aged 22-29 and 3.1 for wives aged 30-39. (In 1965, these values were 3.8 and 4.2, respectively.) By identifying differentials between different marriage cohorts in terms of birth interval, marriage duration at birth, and age at birth would give family planning program operators in Taiwan a better idea on advising couples to avoid unwanted pregnancies that during which specific period of time after marriage that they should seriously think about doing something with respect to birth control. The change overtime of these values would also help to assess their impact on the length of generation. On the other hand, since respondents in these two surveys having four or more children are only a minority (41% and 39% for KAP-IV survey and VOC study, respectively, analyzing differentials beyond the third birth would find too few cases remaining and make meaningful comparison impossible.

Since adolescent fertility in Taiwan has been poorly understood, this study intends more specifically to make distinction about the timing of births and birth intervals between those who were married before and after 20 years of age in an attempt to shed light on this problem of increasing importance.

Birth interval by year of marriage

According to both sets of data, regardless of age at marriage, the mean first birth interval used to be around 19 months for those were married in the early 50's in Taiwan. In about two decades, it was down to 11.9 months and 13.3 months for KAP-IV and VOG, respectively for those who got married in the period 1969-1971, (Table 1, upper-left panel) a reduction of more than 30 percent. The second birth interval was also cut by about 10 months. This proves that the oft-mentioned impression that the first birth interval has been shortened from about 18 months sometime in the 50's to 12 months recently is no 'baloney'. For the third birth interval, about same length of time was 'saved' in comparison with the second birth interval, i. e., 10 months. Thus we can say that, within four to five years after marriage, the majority of wives with normal fertility would have had the mean desired number of children if they were married in 1969-71. In other words, these wives would complete their desired family size of three at least two years ahead of their counterparts twenty years ago.

Table 1 A Comparison of Mean Birth Interval in Months
by Year of Marriage, or by Age at Marriage,
and by Birth Order between Data from
1973 KAP-IV Survey and 1976 VOG Study

	KAP-IV	No. of Women	VOC	No. of Women	Age at Marriage	KAP-IV	No. of Women	VOC	No. of Women
Birth									
1-53	19.3	226	19.2	112	16-17	17.0	656	16.8	154
4-56	17.7	526	19.6	199	18-19	16.5	1,397	16.9	388
7-59	17.8	687	17.6	233	20-21	15.0	1,334	17.0	460
0-62	16.6	797	17.0	219	22-23	13.7	886	14.8	352
3-65	15.2	844	15.6	243	24-25	13.7	370	15.2	152
6-68	13.6	919	14.3	269	26-27	14.6	133	14.9	43
9-71	11.9	834	13.3	299	28-29	17.6	43	*	16
					30+	*	14	*	9
	15.4	4,833	16.2	1,574	Total	15.4	4,833	16.2	1,574
Birth									
1-53	28.3	225	33.3	112	16-17	26.2	636	27.6	157
4-56	28.1	532	30.8	207	18-19	25.8	1,308	27.5	385
7-59	26.8	688	28.0	235	20-21	23.8	1,236	27.7	460
0-62	25.1	780	25.5	224	22-23	22.0	787	24.1	350
3-65	23.5	839	24.9	243	24-25	22.6	325	25.2	154
6-68	22.3	877	24.8	272	26-27	22.8	110	23.4	41

1969-71	18.7	510	22.8	276	28-29	23.4	36	*	
					30+	*	13	*	
Total	24.3	4,451	26.4	1,569	Total	24.3	4,451	26.4	
<u>3rd Birth</u>									
1951-53	29.5	219	33.3	109	16-17	27.7	526	31.5	
1954-56	27.6	511	31.0	195	18-19	27.1	1,059	30.0	
1957-59	28.2	654	29.7	218	20-21	25.9	964	28.5	
1960-62	27.9	709	29.9	209	22-23	26.3	604	27.7	
1963-65	25.9	730	27.8	209	24-25	25.2	223	26.8	
1966-68	22.8	573	26.0	222	26-27	26.0	63	25.3	
1969-71	18.3	72	24.4	148	28-29	25.7	23	*	
					30+	*	6	*	
Total	26.6	3,468	28.7	1,310	Total	26.6	3,468	28.7	

*= mean not calculated for less than 20 cases.

Timing of birth is one of the determinants of fertility level. The shorter the birth interval, or the shorter the duration of marriage at birth, or the younger the age at birth, the higher the age-specific marital fertility, *ceteris paribus*. Therefore from the family planning program point of view, it is alarming to see a shortening birth interval. It also seems ironic, since information about contraception has become much more available and contraceptive practice rate increased to a relatively high level of 44% by 1970 (Sun, Lin, and Freedman, 1978) The question here is, as mentioned previously in the beginning of this paper, the rather late adoption of contraception among Taiwanese couples. According to KAP-IV survey in 1973, only 31% of wives interviewed approved of birth control-before the first child is born, whereas 36% of VOC study respondents answered in 1976 that they would agree to do something to put off the first child.

Birth interval by age at marriage

As the women getting married later and later, the birth interval, regardless of parity, is becoming shorter and shorter, as can be seen in the right-hand panel of Table 1, with the exceptions of those who were married at ages 26-27 and 28-29 for KAP-IV respondents. For example, for wives interviewed in VOC study, those who were married at ages younger than 22, the first birth interval averaged around 17 months, compared to 14.9 months for those who were married at a relatively late age of 26-27. A steady decrease of third birth interval as the age at marriage goes up was also observed for the VOC data. In comparison, the second or the third birth intervals by age at marriage for KAP-IV respondents appear not to decrease in such way, with some fluctuations.

Table 2 Mean Birth Interval in Months of Three Marriage Cohorts during
1951-71 by Age at Marriage, by Birth Order, and by Source of Data

Source of Data /Birth Order/Marriage Cohort	Age at Marriage						No. of Women					
	16-17	18-19	20-21	22-23	24-25	26-27	16-17	18-19	20-21	22-23	24-25	26-27
KAP-IV												
1st Birth												
(1) 1951-53	19.0	19.4	*	*	*	*	93	125	8	0	0	0
(2) 1960-62	17.9	18.0	17.1	13.9	14.0	16.3	95	202	228	171	70	28
(3) 1969-71	13.1	11.8	11.8	11.7	11.7	13.0	49	212	23	187	86	45
%change(2)/(1)	-6	-7	u	u	u	u						
%change(3)/(2)	-27	-34	-31	-16	-16	-20						
2nd Birth												
(1) 1951-53	28.1	28.9	*	*	*	*	93	124	8	0	0	0
(2) 1960-62	26.5	27.2	24.6	23.4	24.7	22.3	94	198	225	166	69	26
(3) 1969-71	21.3	19.5	18.2	18.2	16.8	17.2	42	127	150	107	50	23
%change(2)/(1)	-6	-6	u	u	u	u						
%change(3)/(2)	-20	-28	-26	-22	-32	-23						
3rd Birth												
(1) 1951-53	28.7	30.4	*	*	*	*	91	120	8	0	0	0
(2) 1960-62	27.7	29.1	27.7	26.8	27.4	27.6	86	184	204	151	59	23
(3) 1966-68	21.9	23.5	22.5	22.8	21.8	*	81	154	158	104	49	18
%change(2)/(1)	-3	-4	-u	u	u	u						
%change(3)/(2)	-21	-19	-19	-15	-20	u						

* = mean not calculated for less than 20 cases.

u = unavailable.

Table 2 Mean Birth Interval in Months of Three Marriage Cohorts during
1951-71 by Age at Marriage, by Birth Order, and by Source of Data
(cont'd)

Source of Data /Birth Order/Marriage Cohort	Age at Marriage						No. of Women					
	16-17	18-19	20-21	22-23	24-25	26-27	16-17	18-19	20-21	22-23	24-25	26-27
VOC												
1st Birth												
(1) 1951-53	*	19.1	19.4	*	*	*	16	54	41	1	0	0
(2) 1960-62	*	16.7	19.4	16.0	12.7	*	16	55	67	50	21	9
(3) 1969-71	13.5	13.4	11.9	14.0	12.6	*	24	63	77	75	38	13
%change(2)/(1)	u	-13	0	u	u	u						
%change(3)/(2)	u	-20	-20	-12	-1	u						
2nd Birth												
(1) 1951-53	*	29.6	39.7	*	*	*	16	53	42	1	0	0
(2) 1960-62	*	26.0	25.5	26.1	24.6	*	16	54	66	54	23	10
(3) 1969-71	24.6	23.6	22.4	22.6	23.1	*	23	57	74	67	36	12
%change(2)/(2)	u	-12	-36	u	u	u						
%change(3)/(2)	u	-9	-12	-13	-6	u						

3rd Birth

(1) 1951-53	*	35.2	31.0	*	*	*	16	52	40	1	0	0
(2) 1960-62	*	31.5	28.1	29.8	27.5	*	15	51	61	49	22	10
(3) 1969-71	*	23.8	25.2	23.3	*	*	11	29	46	33	16	9
%change(2)/(1)	u	-11	-9	u	u	u						
%change(3)/(2)	u	-24	-10	-22	u	u						

* = mean not calculated for less than 20 cases.

u = unavailable.

Birth interval by year of marriage and by age at marriage

Table 2 reveals that when taking age at marriage into account, different marriage cohorts did not show a consistent rate of change for the first and second birth intervals. The trend for the first birth interval presents a far more outstanding picture for those who were married at younger ages, i. e., before 22 years. The 'shrinkage' amounts to about 30%, with the mean interval from 19 months down to less than a year. The big change occurred during the 60's. Yet it is not true that, as early as 1970, younger brides had their first child earlier than those who got married at an older age, as was commonly believed here in Taiwan. This wrong assertion presumably comes from the increasing promiscuity of the younger generation, and as a result, a higher incidence of premarital sexual relations. Furthermore, common knowledge assumes that young people tend to behave 'irrationally', i.e., not practising contraception even if they possess knowledge about birth control. The data in Table 3 seem to support the promiscuity assumption overtime, while the equal length of birth intervals across different ages (groups) at marriage denies the assertion of 'irrationalness.' Whether this statement is still valid up to now requires further study, but one thing we must bear in mind is that the report of premarital pregnancies undoubtedly understates its true incidence.

With regard to the 'irrationalness' of the very young, older women, in this sense 24 years old or older, are believed to be more mature, more realistic about family life, know more about birth control, and hence not liable to engage in premarital sexual relations. Again, statistics in Table 2 prove to the contrary. Brides, whether very young or not, are all alike in terms of the timing of first birth.

Table 3 Percent of Premarital Pregnancies Which Ended in Live Births to Total Number of First Live Births by Marriage Cohorts during 1951-71, by Age at Marriage, and by Source of Data

Marriage Cohort	Age at Marriage						No. of Women					
	16-17	18-19	20-21	22-23	24-25	26-27	16-17	18-19	20-21	22-23	24-25	26-27
						<u>KAP-IV</u>						
1951-53	4.3	4.0	*	*	*	*	93	125	8	0	0	0
1954-56	6.8	5.5	5.8	3.4	*	*	88	236	173	29	0	0
1957-59	6.4	6.4	5.4	8.8	9.7	*	93	203	221	137	31	2
1960-62	6.3	11.9	11.1	7.6	7.7	7.1	95	202	228	171	70	28
1963-65	8.8	12.8	13.8	10.3	9.7	10.0	102	180	217	204	93	30
1966-68	18.4	19.2	16.9	10.8	10.0	3.6	136	239	249	158	90	28

1969-71	26.5	24.5	17.2	17.6	15.1	6.7	49	212	238	187	86	45
Total	10.5	12.6	12.0	10.9	10.5	6.8	656	1,397	1,334	886	370	133

							<u>VOC</u>					
1951-53	*	5.6	7.3	*	*		16	54	41	1	0	0
1954-56	*	4.8	2.9	4.2	*	*	15	63	69	48	4	0
1957-59	7.7	11.7	6.5	2.4	0.0	*	26	60	77	41	22	6
1960-62	*	3.6	3.0	8.0	4.8	*	16	55	67	50	21	9
1963-65	16.0	7.5	8.2	15.4	6.9	*	25	40	61	78	29	6
1966-68	21.9	15.1	23.5	3.4	7.9	*	32	53	68	59	38	9
1969-71	29.2	19.1	19.5	12.0	15.8	*	24	63	77	75	38	13
Total	13.6	9.8	10.4	8.5	7.9	14.0	154	388	460	352	152	43

* = less than 20 cases in base.

Based on 1967 Taiwan KAP-II survey data, Jain estimated that among Taiwanese married women, those who aged 25 had the highest fecundability. (Jain, 1969) Since in Taiwan very few couples practice contraception before the first child, we expect that under natural fertility the cumulative length of intervals of three births for those who were married at ages 24-25 would be the shortest of all. In fact, for the marriage cohort of 1969-71 (1966-68 for the third birth) according to KAP-IV data, this proves to be the case with a total length of 50.3 months, while for those who married at ages 16-17, 18-19, 20-21, and 22-23, it is 56.3, 54.8, 52.5, and 52.7 months, respectively. The same is true for the marriage cohort of 1969-62 according to VOC study respondents. (64.8 months against 74.2, 73.0, and 71.9 months)

One more peculiar phenomenon deserves mentioning here. The older brides tend to have shorter second and third birth intervals compared with younger ones. This means that even though they started childbearing at a later date, nevertheless they would like to complete family size desired at about the same time as those who were married at an earlier age.

Marriage duration at birth by year of marriage

Another measure to determine the timing of birth is the duration of marriage at birth. The duration is defined as the length of time from the date of first marriage to the date of the specific birth. Because of the shortening birth intervals, the mean duration of marriage at second birth was 47.4 months for the marriage cohort of 1951-53, in comparison with 28.6 months for the marriage cohort of 1969-1971, cutting 40% (19 months) in 20 years according to KAP-IV survey. (Table 4) A slightly lower magnitude of change (33%, from 51.7 months to 34.1 months) was also observed for VOC study. We also learn that those who were married in the end of the 60's averaged an astonishing 34 months ahead of those married in early 50's by the time they had their third child, if we base our observation on KAP-IV data. Statistics from VOC present a remarkable shrinkage of one-third, but still in much lesser degree comparing with that of KAP-IV (45%).

Table 4 A Comparison of Mean Duration of Marriage at Birth in Months by Year of Marriage, or by Age at Marriage, and by Birth Order between Data from 1973 KAP-IV Survey and 1976 VOC Study

Year of Marriage	KAP-IV	No. of Women	VOC	No. of Women	Age at Marriage	KAP-IV	No. of Women	VOC	No. of Women
<u>1st Birth</u>									
1951-53	19.3	226	19.2	112	16-17	17.0	656	16.8	152
1954-56	17.7	526	19.6	199	18-19	16.5	1,397	16.9	384
1957-59	17.8	687	17.6	233	20-21	15.0	1,334	17.0	460
1960-62	16.6	797	17.0	219	22-23	13.7	886	14.8	352
1963-65	15.2	844	15.6	243	24-25	13.7	370	15.2	152
1966-68	13.6	919	14.3	269	26-27	14.6	133	14.9	43
1969-71	11.9	834	13.3	299	28-29	17.6	43	*	16
					30+	*	14	*	9
Total	15.4	4,833	16.2	1,574	Total	15.4	4,833	16.2	1,574
<u>2nd Birth</u>									
1951-53	47.4	225	51.7	112	16-17	42.3	636	42.7	157
1954-56	45.4	531	48.5	207	18-19	41.7	1,306	43.5	384
1957-59	43.7	686	44.4	232	20-21	38.4	1,235	42.8	457
1960-62	40.8	779	40.6	223	22-23	35.0	782	37.4	349
1963-65	38.0	835	39.2	243	24-25	35.4	323	38.2	154
1966-68	34.5	874	37.3	271	26-27	35.7	106	34.6	41
1969-71	28.6	506	34.1	276	28-29	33.6	36	*	13
					30+	*	12	*	9
Total	39.0	4,436	41.1	1,564	Total	39.0	4,436	41.1	1,564
<u>3rd Birth</u>									
1951-53	75.3	219	83.1	109	16-17	69.6	526	72.0	133
1954-56	72.3	511	77.8	195	18-19	69.1	1,058	72.6	328
1957-59	71.1	654	71.3	221	20-21	64.1	964	69.9	400
1960-62	67.2	708	69.0	209	22-23	60.4	603	63.3	288
1963-65	61.9	729	65.1	209	24-25	59.3	223	62.2	114
1966-68	53.8	572	61.1	222	26-27	60.1	61	58.4	35
1969-71	41.1	70	54.5	148	28-29	54.3	23	*	8
					30+	*	5	*	7
Total	65.4	3,463	68.2	1,313	Total	65.4	3,463	68.2	1,313

* = mean not calculated for less than 20 cases.

Marriage duration at birth by age at marriage

At the first glance, Table 4 (the right-hand panel) gives us an impression that women getting married later tend to have their children earlier in comparison with those who were married earlier. It seems to indicate that the tempo to have children for the older brides is faster than that of the younger ones. In other words, within a specific period of time, say 60 months, women married at ages 26-27 could reach the assumed desired family size of three, but for those married at ages 18-19, an additional nine months would be required to do the same thing. But all these statements can only be made under one condition: there has been no change of birth intervals over a rather long period of time. The fact is that with a time period spanning 20 years from 1951 to 1971, there was indeed a substantial change in all the first three birth intervals. Therefore, observations just mentioned can not be taken too seriously. In order to get a clearer picture of the whole situation, we shall introduce control of age at marriage at the same time.

Duration of marriage by year of marriage and by age at marriage

Table 5 Mean Duration of Marriage at Birth in Months of Three Marriage cohorts during 1951-71 by Age at Marriage, by Birth Order, and by Source of Data

Source of data /Birth Order/Marriage Cohort	Age at Marriage						No. of Women					
	16-17	18-19	20-21	22-23	24 25	26-27	16-17	18-19	20-21	22-23	24-25	26-27
KAP-IV												
1st Birth												
(1) 1951-53	19.0	19.4	*	*	*	*	93	125	8	0	0	0
(2) 1960-62	17.9	18.0	17.1	13.9	14.0	16.3	95	202	228	171	70	28
(3) 1969-71	13.1	11.8	11.8	11.7	11.7	13.0	49	212	238	187	86	45
%change(2)/(1)	-6	-7	u	u	u	u						
%change(3)/(2)	-27	-34	-31	-16	-16	-20						
2nd Birth												
(1) 1951-53	47.1	47.8	*	*	*	*	93	124	8	0	0	0
(2) 1960-62	43.6	44.1	41.5	36.3	38.7	35.6	94	198	225	166	69	25
(3) 1969-71	31.6	29.2	28.3	28.3	27.2	28.3	42	127	150	104	50	23
%change(2)/(1)	-7	-8	u	u	u	u						
%change(3)/(2)	-28	-34	-32	-22	-30	-21						
3rd Birth												
(1) 1951-53	74.4	76.4	*	*	*	*	91	120	8	0	0	0
(2) 1960-62	69.8	72.1	66.7	62.0	65.6	60.3	86	184	204	151	59	22
(3) 1966-68	52.2	55.9	54.3	52.5	50.8	*	81	154	158	104	49	17
%change(2)/(1)	-6	-6	u	u	u	u						
%change(3)/(2)	-25	-22	-19	-15	-23	u						

* = mean not calculated for less than 20 cases.

u = unavailable.

Table 5 Mean Duration of Marriage at Birth in Months of Three Marriage Cohorts during 1951-71 by Age at Marriage, by Birth Order, and by Source of Data (cont'd)

Source of Data /Birth Order/Marriage Cohort	Age at Marriage						No. of Women					
	16-17	18-19	20-21	22-23	24-25	26-27	16-17	18-19	20-21	22-23	24-25	26-27
VOC												
<u>1st Birth</u>												
(1) 1951-53	*	19.1	19.4	*	*	*	16	54	41	1	0	0
(2) 1960-62	*	16.7	19.4	16.0	12.7	*	16	55	67	50	21	9
(3) 1969-71	13.5	13.4	11.9	14.0	12.6	*	24	63	77	75	38	13
%change(2)/(1)	u	-13	0	u	u	u						
%change(3)/(2)	u	-20	-39	-12	-1	u						
<u>2nd Birth</u>												
(1) 1951-53	*	48.5	57.2	*	*	*	16	53	42	1	0	0
(2) 1960-62	*	42.4	43.3	39.9	34.4	*	16	54	65	54	23	10
(3) 1969-71	35.7	35.8	32.8	33.5	34.7	*	23	57	73	67	37	12
%change(2)/(1)	u	-13	-24	u	u	*						
%change(3)/(2)	u	-16	-24	-16	+1	u						
<u>3rd Birth</u>												
(1) 1951-53	*	82.4	84.8	*	*	*	16	52	40	1	0	0
(2) 1960-62	*	71.9	70.8	69.0	60.0	*	15	51	61	49	22	10
(3) 1969-71	*	56.6	54.3	53.7	*	*	11	29	46	33	16	9
%change(2)/(1)	u	-13	-17	u	u	u						
%change(3)/(2)	u	-21	-23	-22	u	u						

* = mean not calculated for less than 20 cases.

u = unavailable.

As can be seen from Table 5, there was a difference of about 9 months in mean duration of marriage at either the second or the third birth for the marriage cohort of 1960-62. (KAP-IV) By 1969-71, the difference between those who married at ages 20-21 and those of 22-23 or 26-27 disappeared. In particular, those who were married at ages 18-19 shows a difference of only one to two months in contrast with other age groups, indicating a convergence of differentials. The mean duration of marriage at third birth was also witnessing a similar convergence. If the trend continued, the differentials would certainly be greatly reduced. The data derived from VOC study in 1976 demonstrate the same pattern of development, with regard to the changes of mean duration of marriage at birth over years. In addition, both sets of data indicate a much greater degree of change in each segment of time period during the 60's than that of the 50's. This seems to be a logical adjustment of way of life in correspondence to the rapid socio-economic development during these two decades, as substantiated by some key indicators such as GNP index, total industrial production index, percent of primary school graduates enrolled

in junior high school, and all sorts of communication and transportation indicators. (Economic Planning Council, 1977)

Age at birth by year of marriage or by age at marriage

On the one hand, age at first marriage had been getting a bit older during the period 1951-1971 (from about 18 to 21), while on the other hand, the birth intervals were becoming shorter and shorter. These two conditions compensate each other to make the age at birth to remain at almost the same level by the time the women had three births.

For example, KAP-IV data show that the mean age at third birth was 24.0 years for those who were married in 1951-53, whereas for the marriage cohort of 1969-71, it was 24.4 years. (Table 6) Likewise, VOC study presents a comparison between these same marriage cohorts by the time the third child was born: 25.4 years vs. 25.3 years. This means that, on the average, when a woman was married in 1951-53, by the time she had three children, she would be at about the same age as someone who got married 20 years later, again, *ceteris paribus*. However, any interpretation beyond this point should be cautious, because the age at marriage factor was not taken into account in making the above statement. The statistics appearing in the right-hand panel in Table 6 are self-explanatory.

Table 6 A Comparison of Mean Age at Birth in Completed Years
by Year of Marriage, or by Age at Marriage,
and by Birth Order between Data from
1973 KAP-IV Survey and 1976 VOC Study

Year of Marriage	KAP-IV	No. of Women	VOC	No. of Women	Age at Marriage	KAP-IV	No. of Women	VOC	No. of Women
<u>1st Birth</u>									
1951-53	19.3	226	20.1	113	16-17	18.0	663	17.6	161
1954-56	20.4	537	21.2	210	18-19	19.9	1,420	19.6	396
1957-59	21.4	698	21.4	239	20-21	21.7	1,351	21.4	477
1960-62	21.9	804	21.7	229	22-23	23.5	901	23.0	365
1963-65	22.2	857	21.9	249	24-25	25.5	375	25.0	160
1966-68	21.6	935	21.7	283	26-27	27.4	140	27.1	44
1969-71	22.0	856	21.8	305	28-29	29.5	46	*	16
					30+	*	17	*	9
Total	21.6	4,913	21.6	1,628	Total	21.6	4,913	21.6	1,628
<u>2nd Birth</u>									
1951-53	21.6	225	22.9	112	16-17	20.1	636	19.8	158

1954-56	22.8	532	23.7	208	18-19	22.1	1,308	21.8	
1957-59	23.6	688	23.7	235	20-21	23.7	1,236	23.5	
1960-62	23.9	780	23.7	226	22-23	25.3	787	24.9	
1963-65	24.1	839	23.9	244	24-25	27.3	325	27.0	
1966-68	23.3	877	23.7	273	26-27	29.1	110	28.8	
1969-71	23.3	510	23.6	277	28-29	31.2	33	*	
					30+	*	13	*	
Total	23.5	4,451	23.6	1,575	Total	23.5	4,451	23.6	1,575
<u>3rd Birth</u>									
1951-53	24.0	219	25.4	109	16-17	22.4	526	22.2	
1954-56	25.0	511	26.1	196	18-19	24.3	1,059	24.3	
1957-59	25.8	654	26.0	221	20-21	25.8	964	25.8	
1960-62	26.1	709	26.2	210	22-23	27.5	604	27.1	
1963-65	26.0	730	25.9	210	24-25	29.3	223	28.9	
1966-68	24.9	573	25.6	224	26-27	31.0	63	30.9	
1969-71	24.4	72	25.3	149	28-29	32.8	23	*	
					30+	*	6	*	
Total	25.5	3,468	25.8	1,319	Total	25.5	3,468	25.8	1,319

* = mean not calculated for less than 20 cases.

Table 7 Mean Age at Birth in Completed Years of Three Marriage Cohorts during 1951-71 by Age at Marriage, by Birth Order, and by Source of Data

Source of Data	Age at Marriage							No. of Women										
	/Birth Order/Marriage Cohort							16-17	18-19	20-21	22-23	24-25	26-27	16-17	18-19	20-21	22-23	24-25
<u>KAP-IV</u>																		
<u>1st Birth</u>																		
(1) 1951-53	18.2	20.0	*	*	*	*	93	125	8	0	0	0	0	0	0	0	0	0
(2) 1960-62	18.0	20.0	22.0	23.5	25.5	27.5	96	203	229	174	70	29	29	29	29	29	29	29
(3) 1969-71	17.9	19.6	21.4	23.2	25.4	27.4	51	218	243	193	86	45	45	45	45	45	45	45
%change(2)/(1)	-1	0	u	u	u	u												
%change(3)/(2)	-1	-2	-3	-1	0	0												
<u>2nd Birth</u>																		
(1) 1951-53	20.5	22.4	*	*	*	*	93	124	8	0	0	0	0	0	0	0	0	0
(2) 1960-62	20.1	22.2	24.0	25.4	27.6	28.9	94	198	225	166	69	26	26	26	26	26	26	26
(3) 1969-71	19.5	21.1	22.9	24.6	26.7	28.7	42	127	150	107	50	23	23	23	23	23	23	23
%change(2)/(1)	-2	-1	u	u	u	u												
%change(3)/(2)	-3	-5	-5	-3	-3	-1												
<u>3rd Birth</u>																		
(1) 1951-53	22.8	24.8	*	*	*	*	91	120	8	0	0	0	0	0	0	0	0	0

(2) 1960-62	22.4	24.6	26.1	27.6	29.8	31.0	86	184	204	151	59	23
(3) 1966-68	20.9	23.3	25.0	26.8	28.6	*	81	154	158	104	49	18
%change(2)/(1)	-2	-1	u	u	u	u						
%change(3)/(2)	-7	-5	-4	-3	-4	u						

* = mean not calculated for less than 20 cases.

u = unavailable.

Table 7 Mean Age at Birth in Completed Years of Three Marriage Cohorts during 1951-71 by Age at Marriage, by Birth Order, and by Source of Data (cont'd)

Source of Data	Age at Marriage						No. of Women					
	16-17	18-19	20-21	22-23	24-25	26-27	16-17	18-19	20-21	22-23	24-25	26-27
VOC												
1st Birth												
(1) 1951-53	*	19.7	21.5	*	*	*	16	54	42	1	0	0
(2) 1960-62	*	19.6	21.7	23.0	24.3	*	17	55	68	54	24	10
(3) 1969-71	17.3	19.3	21.0	22.9	25.1	*	24	64	80	77	38	13
%change(2)/(1)	u	-1	+1	u	u	u						
%change(3)/(2)	u	-2	-3	0	+2	u						
2nd Birth												
(1) 1951-53	*	22.2	24.7	*	*	*	16	53	42	1	0	0
(2) 1960-62	19.4	21.6	23.5	25.2	26.7	*	17	55	66	54	23	10
(3) 1969-71	19.2	21.1	22.7	24.6	26.8	*	23	57	74	67	37	12
%change(2)/(1)	u	-3	-5	u	u	u						
%change(3)/(2)	-1	-2	-3	-2	0	u						
3rd Birth												
(1) 1951-53	*	25.0	27.0	*	*	*	16	52	40	1	0	0
(2) 1960-62	*	24.2	25.9	27.6	28.7	*	15	51	62	49	22	10
(3) 1969-71	*	22.9	24.4	26.2	*	*	11	29	47	33	16	9
%change(2)/(1)	u	-3	-4	u	u	u						
%change(3)/(2)	u	-5	-6	-5	u	u						

* = mean not calculated for less than 20 cases.

u = unavailable.

Age at birth by year of marriage and by age at marriage

It is only natural to see that women getting married at earlier ages should have their children at earlier ages compared with those who were married at older ages, if we look at the figures horizontally in all panels in Table 7. But within each specific age (group) at marriage, in all but only very few instances that those who were married in late 60's or early 70's were becoming younger and younger, when their children were born, compared with those who were married either in early 60's or in 50's, indicating again that the shortening birth interval was more powerful than that of the delayed age at marriage to make the age at birth younger. For example, for the marriage cohort of 1966-68 if they were married at ages 18-19, they would have had three children by the time they

were 23.3 years old, in comparison with 24.8 years for the marriage cohort of 1951-53 (KAP-IV) If women were to stop having children after three, then open birth interval, the length of time from the date of last live birth to the date of analysis, would obviously become much longer. In other words, the women face a longer period of time exposed to the risk of pregnancy. How to persuade these women not to have additional children by practising family planning for such a long period of time requires tremendous efforts by the program operators in Taiwan.

Discussion

Since the society has been becoming more and more permissive with regard to sex, along with longer years of education and a rising age at marriage, the general impression about the fertility of young women is that the higher incidence of premarital pregnancies would certainly cut the length of birth intervals on the average of those who were married at the relatively younger ages with a magnitude much greater than that of those who were married at older ages. This 'irrationalness' of the very young appears to be ironic to the established family planning program in Taiwan, suggesting loopholes or failures of its activities. However, our analysis of the data from two independent samples indicates that the 'irrationalness' assumption seems not to be a problem too distinct since we found that notwithstanding different age at marriage, birth intervals were universally being cut shorter and shorter. The time required to reach the presumed desired number of children was almost the same whether one was married in her adolescent years or at a more mature age. The disappearance of differentials of the timing of births and birth intervals demonstrates a convergence of behavior never learned before.

The shortening birth intervals pose danger to the on-going family planning program in Taiwan because it will undoubtedly push the age-specific marital fertility, especially in the early stage of reproductive years, to a higher level. With shorter birth interval and younger age at birth, there is naturally a longer period of time exposed to the risk of pregnancy if not well protected by effective contraception. This is and still will be a big task for the population planners in Taiwan. The situation can not be considered as optimistic either, with the persistence of son preference. Because some couples might well detour their decision to stop having children in the course of some 16 years for those who were married at ages 26-27 to 24 years for those who were married at ages 16-17. (estimated from Table 7 according to KAP-IV survey data) Even though there is "evidence that the underlying preference distribution for number of children, as indicated by the Coombs IN (number preference) scale, shifted toward an underlying preference for a smaller, rather than a larger, number of children," (Sun, Lin, and Freedman, 1978) between 1973 and 1976.

Another point deserves our special attention is the problem of adolescent fertility. The following statistics reveal a picture quite appalling to those concerned with population

growth in Taiwan:

	<u>1968</u>	<u>1970</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
A. Total number of births	394,260	394,015	366,942	367,823	367,647	424,075	393,633
B. No. of births to women under 20	30,590	33,645	29,819	31,004	34,248	35,991	35,189
C. % B/A	7.8	8.5	8.1	8.4	9.3	8.5	8.9
Age-specific fertility of MW 15-19 ^a	478	502	536	576	639	677	663

Source: 1977 Taiwan-Fukien Demographic Factbook, R.O.C., Ministry of the Interior, Taipei, 1978, pp. 934-35.

It is clear that births to women under 20 represent a growing proportion of all births. These mothers, not only unable to provide their children with adequate care through responsible parenthood because most of them never assumed non-familial roles, but also not economically strong enough to rear children. In addition, the number of illegitimate births seems to be on the rise in recent years. (6,186 in 1971, 6,260 in 1974, and 6,900 in 1977) All of these will certainly add more responsibility to the society as a whole.

In relation to the problem of adolescent fertility is the lowering age at menarche. The mean age at menarche for Taiwanese girls was 13.4 years according to a sample survey in 1967. (Chang, 1979) It is assumed to approach 13 years, or even lower, in the early 70's as better nutrition would surely contribute to an earlier age at menarche. Though, based on data of Western countries, age at menarche will reach a plateau at 12-13 years. With more years of education and a rising age at marriage, and an earlier age at menarche, the Taiwanese girls are becoming to have a longer period of time exposed to the risk of premarital sex, or as Hunt put it, "a widening gap exists between sexual and social adulthood." (Hunt, 1976) The majority of premarital pregnancies tend to force, in Taiwan, the women to get married earlier than they would like to do. Some may just become "unwed mothers," because "abortion is often more traumatic physically for adolescents than for older women, since the young usually wait longer before seeking termination. Inexperience, ignorance, legal and social restrictions, and economic constraints hinder adolescents from seeking prompt termination of unwanted pregnancies." (Hunt, 1976) In responding to the calls for appropriate programs for adolescents, the family planning program in Taiwan has already began to incorporate related activities with its regular responsibilities, such as population education in high schools, educational activities for young factory workers, premarital classes, etc. Yet we can not deny that this group of population is especially vulnerable to the unfavorable effects of

some sporadic incidents like 'the year of the Dragon' in 1976, or 'the year of the widower' in 1979. Contrary to the wish of population planners, these 'superstitious' beliefs received unduly coverage in the mass media. The task to counter-attack this type of incidents seems to call for help outside from family planning program for more imaginative mind and energetic work.

Conclusion

Cohort analysis of the data from two independent sample surveys in 1973 and 1976 reveals the the birth intervals had been shortening during the period of 1951-71 in Taiwan, regardless of age of mother at marriage. While the assumption of higher incidence of premarital sex proved to be true, but the 'irrationalness' assertion about the young seems to be groundless, since first birth interval was almost the same for those who were married before and after age 20. Yet, it is also true that the first birth interval has been cut from 18 months to 12 months and the second interval from 30 to 18 months. The older brides however tend to have the second and third child earlier than the younger. In addition, parallel to a more rapid socio-economic development, the magnitude of change of intervals was greater in the recent decade than that of the previous one. The shortening birth interval also cuts the time span between generation and expedites population growth, even if the ultimate family size remains unchanged. In order to get rid of this peculiar 'irony' of development, efforts in encouraging couples to space longer between childbirths should receive higher priority in the operation of family planning program in Taiwan, especially at this critical point of time when an increasing number of women are entering reproductive years.

References

- Chang Chun-hsing 1979. "A Pzzle about sex education" *Ming Sheng Pao*, April 19, 1979.
- Chow, L. P. 1974. "The island-wide family planning program in Taiwan: Analysis of the accomplishments of the past eight years." *Population Studies* 28(1):107-126.
- Economic Planning Council 1977. Taiwan Statistical Databook.
- Freedman, Ronald, Albert I. Hermalin, and Te-hsiung Sun 1972. "Fertility trends in Taiwan: 1961-1970." *Population Index* 38(2):148-150.
- Freedman, Ronald, Lolagene C. Coombs, Ming-cheng Chang 1972. "Trends in family size preferences and practice of family planning: Taiwan, 1965-1970." *Studies in Family Planning* 3(12):281-296.
- Freedman, Ronald, Lolagene C. Coombs, Ming-cheng Chang, Te-hsiung Sun 1974. "Trends in fertility, family size preferences, and practice of family planning: Taiwan, 1965-1973." *Studies in Family Planning* 5(9):270-288.
- Jain, Anrudh K. 1969. "Fecundability and its relation to age in a sample of Taiwanese

- women." *Population Studies* 23(1).
- Hunt, William Burr, II 1976. 'Adolescent fertility, risks and consequences.' *Population Reports J*(10):157-175.
- Sun, Te-hsiung, Hui-sheng Lin, and Ronald Freedman 1978. "Trends in fertility, family size preferences, and family planning practice: Taiwan, 1961-1976." *Studies in Family Planning* 9(4):54-70.

結婚和生育的時機與生育間隔的關係

林清祥*

中文摘要

台灣地區自五十三年正式大規模推廣家庭計畫以後，婦女生育水準加速下降，其間社會經濟發展快速，自亦影響一般婦女之生育意願與行爲，有謂現代生活注重享受且對子女依賴程度日益減弱，致第一胎生育間隔自應延長以免影響生活素質提高之追求，惟據 62 年與 65 年之調查資料分析四十年至六十年間結婚之婦女生育間隔反逐年縮短，經查證發現未滿二十歲成婚者婚前性行爲比例高爲其主要原因，但一般於正常年齡成婚者鑑於避孕知識之普遍與現在實行率之高，亦不致有此違反常理之現象，值得進一步研究。生育間隔縮短對減低人口成長率之政策不利，因此如何促使一般夫婦延長間隔應爲家庭計畫工作努力之目標。

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