THE IMPACT OF NUPTIALITY ON FERTILITY TRENDS IN PENINSULAR MALAYSIA, 1957-1980

by

Tan Poo Chang

A thesis submitted for the degree of

Doctor of Philosophy

in the Australian National University

Department of Demography

December 1983

To my parents

The analysis in this thesis represents my original research, conducted between June 1981 and December 1983 in the Department of Demography, R.S.S.S., Australian National University.

Tan Poo Chang

December 1983

THE AUSTRALIAN

ACKNOWLEDGEMENTS

I would like to acknowledge the numerous forms of assistance received from individuals and institutions over the course of this study. It will be impossible for me to acknowledge all by name. I would like to thank in particular:

My supervisors, Dr. Gavin W. Jones and Dr. Peter F. McDonald, for their patience, encouragement and support throughout the whole course of my study;

The United Nations for my research fellowship;

The University of Malaya, Kuala Lumpur, for granting me study leave;

The National Family Planning Board, Kuala Lumpur, for the 1974 Malaysian Fertility and Family Survey data, its director, Datin Dr. Nor Laily Aziz, Dr. Tan Boon Ann, Mr. Hew Wai Sin, Idris and Pik Wah, for various forms of assistance;

The Department of Statistics, Kuala Lumpur, for the 1966-67 West Malaysian Family Survey data and censuses;

The World Fertility Survey, London, for the 1974 MFFS Standard Recode Tape;

East-West Center, East West Population Institute, Honolulu, for the 1966-67 West Malaysian Family Survey Tape;

Prof. Hirschman for the Vital Statistics tape;

The Department of Demography, in particular the Head, Prof. J. C. Caldwell, and the other members of the department who contributed many valuable comments and help in various ways;

Dr. S. Krishnamoorthy who acted as supervisor for six months while Dr. McDonald was away in London;

Dr. S. E. Khoo who read through a number of my chapters;

The United Nations office, Kuala Lumpur, in particular, Phoebe Chu, for various forms of assistance;

Dr. Lim Lin Lean and Loo Hooi Kean and various other members in the Faculty of Economics and Administration, University of Malaya, for their assistance in sending me materials and other help and support;

Wendy Cosford for her help in editing my thesis;

Thong Ly, Jennie Widdowson and Bernadette Derrick for their computer assistance;

Patricia Quiggin for library assistance;

Margaret Smither, Dorothy Trueland and Pat Pyne for typing assistance and assistance with tables and graphs;

Hashim Hassan and Ahminah Abdul Rahman for checking the translations;

Coombs Computing Services Section, for various forms of computer assistance;

My friends, in particular, Sue, Carol H, Bern, Pat P, Margaret, for keeping my spirit up when the going was hard;

Last but not least, I am very grateful to my husband, Hong Kooi, for his encouragement, patience and sacrifice, and my daughter, Gin May, for her patience and tolerance of mummy's work and temper.

Tan Poo Chang

ABSTRACT

The main aim of the thesis is to carry out a systematic study of the relationship between nuptiality and fertility, comparing and contrasting the Malay and Chinese patterns in Peninsular Malaysia. The Indians, being a small and mixed group, are excluded. The study concentrates on the period 1957 to 1980.

The framework of analysis is to examine the nuptiality behaviour of cohorts of women, controlling for their background and socioeconomic characteristics. With the cohort frame in mind, the study first concentrates on analysing the Malay and Chinese nuptiality patterns, using various multivariate techniques. It then moves on to relate the changes in nuptiality patterns to changes in fertility patterns or birth timing. In the final section, an attempt is made to clarify or explain the macro time trends in fertility and nuptiality in Peninsular Malaysia in terms of the observed patterns for cohorts.

The findings are that the 1957-80 period was a period of great social, economic and demographic change. There was improvement in income levels, lower adult and infant mortality, higher levels of education and literacy, higher levels of urbanisation, and greater participation in work outside agriculture, such as in manufacturing and services. There was also evidence of decline in period fertility, which can be attributed to both increasing age at first marriage and lower marital fertility.

The decline in period fertility was faster for the Chinese than the Malays. The shift to childbearing at older ages, which is currently taking place, has caused period fertility to fall below the underlying cohort fertility. The older age at first marriage and hence older age at childbearing of the Chinese compared with the Malays is giving a misleading impression of the extent to which the Chinese are reducing their completed family size. As yet, it is difficult to predict by how much family size is being reduced in Malaysia. The indications are that the postponement of births to later ages may now have reached a point where it is balanced by the making-up of births at older ages. Under these circumstances, if cohort fertility does not continue to decline, period fertility may stabilise and even rise above cohort fertility if younger cohorts continue to space their births closer together. For the Malays, there are signs that the period fertility had already begun to rise in the late 1970s. The Chinese period fertility may only start rising in the 1980s because they have delayed their marriages and births longer than the Malays.

CONTENTS

	Page
ACKNOWLEDGEMENTS	i
ABSTRACT	iii
CONTENTS	v
LIST OF TABLES	ix
LIST OF FIGURES	xvii
LIST OF APPENDIX TABLES	xix
CHAPTER 1. GENERAL BACKGROUND	1
1.1. Introduction	1
1.2. Research Objectives	8
1.3. Review of Literature	8
1.3.1. Studies on Nuptiality and Fertility	8
Age at Marriage and Fertility	10
Marital Stability and Fertility	12
1.3.2. Studies on Nuptiality and Birth Timing	13
1.3.3. Studies on Nuptiality	14
1.4. Laws and Customs of Marriage and Divorce	16
1.4.1. Customary and Statutory Laws in General	17
Marriage	17
Divorce	20
1.4.2. Malay Marriage Customs	24
1.4.3. Chinese Marriage Customs	27
CHAPTER 2. AN OVERVIEW OF MARRIAGE PATTERNS, ATTITUDES AND THEIR RELATIONSHIPS TO FERTILITY TRENDS	29
2.1. Trends in Nuptiality	29
2.1.1. The Age Pattern of Marriage	30
Age at First Marriage	34
Proportion Ultimately Marrying	38
2.1.2. Marital Disruption	38
Divorce	38
Widowhood	47
2.1.3. Remarriage	49

2.1.4. Polygyny 53
2.2. Changes in Marriage Behaviour and Attitudes 54
2.2.1. Choice of a Mate 55
2.2.2. Marriage Arrangement 57
2.2.3. Attitudes Toward Marriage 60
2.2.4. Living Arrangement 61
2.2.5. Ethnic Intermarriage 65
2.3. Introduction to the Relationship Between Nuptiality and Fertility 69
2.3.1. Fertility and Age at First Marriage 74
2.3.2. Stability of Marriage and Fertility 81
2.3.3. Age Difference of Couple and Fertility 81
2.4 Summary of Results 84

CHAPTER 3. CONCEPTUAL FRAMEWORK AND METHODOLOGY 88

3.1. Conceptual Framework 88
3.2. Sources of Data 93
3.2.1. The 1966-67 Malaysian Family Survey (MFS) 94
3.2.2. The 1974 Malaysian Fertility and Family Survey (MFFS) 94
95
3.3. Techniques of Analysis 95
3.3.1. Age at Marriage Model (Coale-McNeil Model Nuptiality Schedule) 97
Individual Data of Ever-married Women 100
Household and Individual Data 102
3.3.2. Proportional Hazards Model 103
Method of Estimation 105
3.4. Problems of Statistical Biases

CHAPTER 4. SOCIAL AND ECONOMIC CHANGES AND DEMOGRAPHIC BEHAVIOUR, 1957-1980 112

4.1. General Social and Economic Trends 112
4.1.1. Economic Structure, Income and Price Level 112
4.1.2. Population Distribution 116
4.1.3. Levels of Mortality 118
4.1.4. Education and Literacy 122
4.1.5. Labour Force Participation 126
4.1.6. Value of Children 129
4.1.7. Contraceptive Knowledge and Practice 131
Knowledge of Family Planning Methods 133
Use of Contraception 134
Pattern of Breastfeeding 136
4.2. Changes by Birth Cohorts 136

CHAPTER 5. EXPLAINING NUPTIALITY BEHAVIOUR 144

5.1. Cohort Differences in Nuptiality Patterns 145
5.1.1. Overall Differences 145
5.1.2. Age at Marriage Model (Coale-McNeil Nuptiality Model Schedule) 154
5.2. Age at First Marriage and Its Determinants 161
5.2.1. Differentials in Age at First Marriage 161
Place of Residence 161
Level of Education and Literacy 166
Work Status Before Marriage 167
5.2.2. Multivariate Analysis - Age at First Marriage 168
Locating Interaction Effects 168
Multiple Classification Analysis 178
5.3. Correlates of Divorce 182
5.3.1. Differentials in the Probability of Divorce 183
Birth Cohorts 184
Marriage Cohorts 189
Ethnicity 190
Age at First Marriage 191
Residential Background 192
Years of Education 193
Woman's Work Experience 194
Presence of Children or Son 194
5.3.2. Multivariate Analyses - Probability of Divorce 197
5.4. Conclusion 203

CHAPTER 6. NUPTIALITY BEHAVIOUR AND FERTILITY 210

6.1. Trends in Fertility 210
6.1.1. Cohort Fertility 215
6.2. Determinants of Fertility 222
6.2.1. Differentials in Fertility 226
6.3. Parity Progression Ratio 233
6.3.1. Effect of Age at First Marriage, Age at First Birth and Marital Stability 235
6.3.2. Effect of Education, Work Status and Migration Status 237
6.3.3. Period and Cohort Effects 238
6.4. Multivariate Analyses: Marriage and Fertility 242
6.4.1. Multiple Classification Analysis 242
Birth Cohort 247
Marriage Cohort 248
6.4.2. Log-linear Models 248
Effect of Education, Age at First Marriage and Birth Cohorts 250
Effect of Contraception 255
Effect of Work Status, Migration Status 260
6.5. Conclusion 261

CHAPTER 7. NUPTIALITY BEHAVIOUR AND BIRTH TIMING 264

7.1. Differences in Mean Age at First Birth 265
7.1.2. Fitting the Coale-McNeil Model to Age at First Birth Data 269
7.2. Marriage to First Birth Interval 275
7.3. First to Second Birth Interval 285
7.4. Second to Third Birth Interval 287
7.5. Multivariate Analyses 293
7.5.1. Determinants of the Timing of the First, Second and Third Births 294
7.5.2. Differences Across Birth Cohorts 301
7.5.3. Effects of Age, Duration and Period 304
7.6. Summary and Discussion of Results 308

CHAPTER 8. SUMMARY AND CONCLUSION - PERIOD AND COHORT RELATIONSHIPS OF NUPTIALITY AND FERTILITY 315

8.1. Main Findings 315
Period and Cohort Relationships of Nuptiality and Fertility 319
8.2. Prospect 323

REFERENCES 327

GLOSSARY 343

LIST OF TABLES

Table		Page
1.1	Population, Vital Rates, and Total Fertility Rates by Ethnic Group	7
2.1	Marital Structure of the Female and Male Population of Age 15 Years and Over	30
2.2	Indicators of Trend in Nonmarriage by Race for Females and Males in Peninsular Malaysia since 1947	32
2.3	Percentage Distribution of Age at First Marriage Among Women Aged 25 Years and Above and Married before 25 Years of Age	36
2.4	Mean Age at First Marriage by Current Age, Education Level and Race for Currently Married Women Less than 45 Years of Age	37
2.5	Difference (in years) between Median Age at Marriage of Men and Women by Ethnic Group, Peninsular Malaysia, 1957 and 1970	37
2.6	Percentage Distribution of Malay and Chinese Ever-married Women by Status of First Marriage by Years Since First Marriage	39
2.7	Proportion of Divorced to Married Women by Ethnic Group by Age	40
2.8	Crude Divorce Rates, 1950 - 1975	41
2.9	Cumulative Percent of Marriage Terminating in Divorce or Death of Husband Within a Given Duration of Marriage by Marriage Order by Race, Using Life Table Technique, 1974 MFFS	44
2.10	Cumulative Percent of Marriage Terminating in Divorce or Death of Husband Within a Given Duration of Marriage by Years Since First Marriage for Ever-married Malay Malay Women, Using the Life Table Technique, 1974 MFFS	45

2.11 Proportion of Widowed to Married Women by Ethnic Group by Age 46

2.12 Mean Age Difference between Couples by Race 48

2.13 Mean Age Difference between Couples by Race by Years Since First Marriage 48

2.14 Percentage of Married Population Aged 10 Years and Over by Number of Times Married by Race and Sex in 1970 49

2.15 Percentage Distribution of Married Women Aged 45-49 Years by Number of Times Married by Race - 1974 MFFS 50

2.16 Percentage Distribution of Married Men and Women 45-49 Years by Number of Times Married by Race 51

2.17 Percentage Distribution of Ever-married Women (15-19 years) by Status of First Marriage and by Marital Status at the Time of Interview, 1974 MFFS 51

2.18 Cumulative Percent of Ever-married Malay Women Remarrying After Divorce and Widowhood by Interval (in months) Since Termination of First Marriage, Using Life Table Technique, 1974 MFFS 52

2.19 Percentage Distribution of Ever-married Women by Current Age and by Race by Opinion on Whether Children Are Willing to Live with Parents, 1974 MFFS 62

2.20 Percentage of Ever-married Women by Race by Current Age by Family Type, 1974 MFFS 63

2.21 Percentage Distribution of Married Couples by Husband's Race and Wife's Race 65

2.22 Percentage Distribution of Married Couples by Husband's Race and Wife's Race, 1974 MFFS 66

2.23 Percentage Distribution of Couples who Intermarry and Total Sample by Various Characteristics - Two Percent 1970 Census 67

2.24 Mean Cumulative Fertility of Ever-married Women by Age and Ethnic Community 70

2.25 Mean Number of Children Ever Born to all Ever-married Women by Age at First Marriage and Years Since First Marriage 73

2.26 Mean Number of Children Ever Born by Age at First Marriage by Years Since Marriage by Malay and Chinese Race, 1974 MFFS 75

2.27 Results Obtained from Applying the Components of Difference Approach to Malay and Chinese Mean Children Ever Born (CEB) of Women Married Only Once, 1974 MFFS 76

2.28 Mean Number of Children Ever Born by Age at First Marriage by Years Since First Marriage by (1) childhood residence; (2) current residence; (3) religion; (4) education; (5) family income 77

2.29 Mean Number of Children Desired by Age at First Marriage by Years Since Marriage by Malay and Chinese Race, 1974 MFFS 79

2.30 Mean Number of Children Ever Born by Years Since First Marriage for all Ever-married Women and Malays by the Number of Times Married, 1974 MFFS 80

2.31 Mean Number of Children Ever Born by Years Since Marriage by Number of Times Married for Total Ever-married Wives and Malay Wives 15-49 years 82

2.32 Mean Number of Children Ever Born by Age Difference Between Husband and wife for Wives 15-49 years of Age 83

2.33 Mean Number of Children Ever Born by Age Difference Between Husband and Wife for All Ever-married Women by Years Since First Marriage, 1974 MFFS 84

4.1 Crude Death Rate per 1000 Population by Ethnicity in Peninsular Malaysia, 1947-1979 119

4.2 Age-Specific Mortality Rates per 1000 Population by Sex, 1957, 1967, 1977 120

4.3	Infant Mortality Rate by Ethnicity, 1950-79 ('000 live births)	121
4.4	Mean Years of Schooling of Malay and Chinese Males and Females above Age 19 Years, 1957 and 1970	126
4.5	Industry of the Experienced Labour Force for Population Aged 10 Years and over by Community and Sex, 1957 and 1970	128
4.6	Percentage of Currently Married Women Using Contraception by Age Groups	135
4.7	Proportion of Malay and Chinese Women over Age 25 Years with No Education or Illiterate, 1974 MFFS	138
5.1	Mean Age at First Marriage for Women Aged 25 Years and over who Married before Age 25 Years by Race for Various Birth Cohorts and Marriage Cohorts, 1974 MFFS	147
5.2	Mean Age at First Marriage for Women Aged 25 Years who Married before Age 25 Years by Race by State by Birth and Marriage Cohorts, 1974 MFFS	149
5.3	Mean Number of Times Married for Ever-married Malay Women Aged 25 years who Married before Age 25 Years by Age at Marriage by State by Birth Cohorts, 1974 MFFS	151
5.4	Percentage Distribution of Malay Ever-married Women whose First Marriages were Dissolved by Years Since First Marriage by State Type and Place of Residence, 1974 MFFS	153
5.5	Estimates of the Parameters of the Coale-McNeil Model fitted to Grouped Marriage Data from the Malaysian Individual Survey, 1974 MFFS	155
5.6	Estimates of the Parameters of the Coale-McNeil Nuptiality Model Fitted to Grouped Marriage Data from both the Household and Individual Surveys, 1974 MFFS	158

5.7 Estimates of the Parameters of the Coale-McNeil Model Fitted to Certain Grouped Marriage Data from both Household and Individual Surveys, when c is Fixed at a Preassigned Level, 1974 MFFS 160

5.8 Mean Age at First Marriage of Malay and Chinese Women Aged 25 Years and Over who Married before Age 25 Years by Childhood Residence, Education (in years), Work Status before Marriage for Various Birth and Marriage Cohorts, 1974 MFFS 162

5.9 Mean Age at Marriage of Malay and Chinese Women obtained from Fitting the Coale-McNeil Nuptiality Model to Group Individual Data of Ever-married Women by Various Characteristics, 1974 MFFS 163

5.10 Mean Age at First Marriage of Malay and Chinese Women Aged 25 Years and over who Married before 25 Years by Migration Status, 1974 MFFS 164

5.11 Age at First Marriage Analysis, Women Aged 25 Years and over who Married before Age 25 Years, Proportion of Variation in Group Explainable for each Predictor (BSS_{ij}/TSS_i) 173

5.12 Age at First Marriage Analysis, Malay and Chinese Women Aged 25 years and over who Married before Age 25 Years, Proportion of Variation in Group Explainable for each Predictor (BSS_{ij}/TSS_i) 178

5.13 MCA Results: Mean Age at First Marriage of Malay and Chinese Ever-married Women Aged 25 Years and Over who Married before Age 25 Years, 1974 MFFS 179

5.14 MCA Results:Mean Age at First Marriage by Educational Groupings with Control for Work Status and Childhood Residence for Malay and Chinese Birth Cohorts, 1974 MFFS 180

5.15 Cumulative Probability of First Marriage (excluding marriages terminated by death of spouse) Terminating in Divorce within Selected Periods for Ever-married Women Aged 25 Years and over, Married before Age 25 Years by Various Characteristics, Using Life Table Technique, 1974 MFFS 185

5.16 Cumulative Probability of First Marriage (excluding marriage terminated by death of spouse) Terminating in Divorce within Selected Periods of Birth and Marriage Cohorts, Malay and Chinese Ever-married Women Aged 25 Years and over, Married before Age 25 Years and over, Married before Age 25 Years by Current Residence, Using Life Table Technique, 1974 MFFS 188

5.17 MCA Results: Probability of Divorce within Five Years of Marriage of Malay Women Aged 25 Years and Over, Married before 25 Years of Age, Married at least 5 Years before the Survey, 1974 MFFS 200

5.18 MCA Results: Mean Probability of Divorce within Five Years of Marriage for Malay Ever-married Women Aged 25 Years and over who Married before Age 25 Years by the New Variable for Selected Birth and Marriage Cohorts, 1974 MFFS 202

6.1 Age Specific and Total Fertility Rates, 1958-1979, Peninsular Malaysia 212

6.2 Period and Cohort Fertility Rates, Peninsular Malaysia 216

6.3 Cumulative Cohort Fertility 218

6.4 Cumulative Percent of Births by Selected Ages by Birth Order of Malay and Chinese Women 219

6.5 Mean Number of Children Ever Born by Age at First Marriage for Malay and Chinese Ever-married Women Aged 25 Years and over who Married before Age 25 Years by Various Characteristics, 1974 MFFS 224

6.6 Duration Ratio or DRAT (Boulier and Rosenzweig's Measure of Fertility) for Malay and Chinese Ever Married Women Aged 25 Years and over who Married before Age 25 Years and who have Married for at least 5 years by Various Characteristics, 1974 MFFS 227

6.7 Completed Fertility (mean children ever born and duration ratio of women aged 40 years and over and aged 45 years and over) of Malay and Chinese Ever Married Women by Various Characteristics, 1974 MFFS 230

6.8 Completed Fertility (mean children ever born and duration ratio of women who said they want no more children)of Malay and Chinese Ever-married Women Aged 15-49 Years by Various Characteristics, 1974 MFFS 231

6.9 Percentage of Women who had a Birth within Five Years of Marriage or since the Last Birth by Various Characteristics, 1974 MFFS 234

6.10 Mean Number of Children Ever Born with or without adjustment for Work Experience, Educational Level, Migration Status and Status of Contraceptive Usage by Age at First Marriage Categories, Ever-married Women aged 25 Years and Over who married before Age 25 Years, 1974 MFFS 244

6.11 Estimates of Completed Fertility of Malay and Chinese Women who Married before Age 25 Years with or without control for Work Experience, Educational Level, Migration Status and Contraceptive Use Status by Age at First Marriage Categories, 1974 MFFS 245

6.12 Mean Number of Children Ever Born of Malay and Chinese Women Aged 25 Years and over who married before Age 25 years with or without control for Work Experience, Contraceptive Use Status, Migration Status, Educational Level by Age at First Marriage Categories by Birth and Marriage Cohorts, 1974 MFFS 246

6.13 Hierarchical Log-linear Models Applied to Mean Number of Children Ever Born by Birth Cohorts (C), Age at First Marriage (A) and Education (E), Malay and Chinese Women over 25 Years of Age, Married before the Age of 25 Years and Married only once, 1974 MFFS 251

6.14 Estimated Effects of Birth Cohorts (C), Education (E) and Age at First Marriage (A) on mean CEB in Various Log-linear Models with or without control for Other Factors for Malay and Chinese, Aged 25 Years and over who Married before the Age of 25 years and Married only once, 1974 MFFS 253

6.15 Estimated Effects of Age at First Marriage (A), Education (E), Current Use of Contraception (P), uncontrolled for Other Variables and in Model (A,E,P), Currently Married Women aged 25-35 years who Married before the Age of 25 Years, 1974 MFFS 256

6.16 Estimated Effects of Contraceptive Use with control for Education and Age at First Marriage in Various Birth Cohorts for Malay and Chinese Currently Married before the Age of 25 Years, 1974 MFFS 259

7.1 Mean Age at First Birth of Women Aged 25 Years and over who Married before the Age of 25 years for Various Birth and Marriage Cohorts by Race and Age at First Marriage, 1974 MFFS 266

7.2 Mean Age at First Birth of Malay and Chinese Women Aged 25 years and over who married before 25 years of age by Various Characteristics, 1974 MFFS 267

7.3 Estimates of the Parameters of the Coale-McNeil Nuptiality Model fitted to grouped First Birth data from the 1974 MFFS Individual Data 270

7.4 Mean Age at First Birth of Malay and Chinese Women Obtained from Fitting the Coale-McNeil Nuptiality Model to Group Individual Data of Ever-married Women by Birth Cohorts and Various Characteristics, 1974 MFFS 271

7.5 Mean Total Birth Interval in Months of Ever-married Women Aged below 25 Years who had at least One Child by Race by Various Characteristics, 1974 MFFS 274

7.6 Cumulative Proportion of Women Having a Birth by Selected Interval Lengths in months since First Marriage by Selected Characteristics Using Life Table Technique, 1974 MFFS 276

7.7 Cumulative Proportion of Women Having a Second Birth by Selected Interval Lengths in months since First Birth by Selected Characteristics Using Life Table Technique, 1974 MFFS 283

7.8 Cumulative Proportion of Women Having a Third Birth by Selected Interval Lengths in months since Second Birth by Selected Characteristics Using Life Table Technique, 1974 MFFS 288

7.9 Estimated Effects of Age at First marriage (A), Education (E) and Migration Status (M) on the Timing of the First Birth with or without control for Other Factors, 1974 MFFS 295

LIST OF FIGURES

Fig.		Page
2.1	Median Age at First Marriage by Race, 1947-1974	35
5.1	AID Tree of Best Splits on Age at First Marriage, Total Sample of Malay and Chinese Women Aged 25 Years and over, Married before Age 25 years, 1974 MFFS	170
5.2A	Profile of Means of Some Groups by Education	171
5.2B	Profile of Means of Some Groups by Work Status before Marriage	172
5.3A	AID Tree of Best Splits on Age at First Marriage, Chinese women Aged 25 Years and over, Married before Age 25 Years, 1974 MFFS	174
5.3B	AID Tree of Best Splits on Age at First Marriage, Malay Women Aged 25 Years and over, Married before Age 25 Years, 1974 MFFS	175
5.4	Profile of Means of Some Groups by Work Status Before Marriage by Race	177
5.5	AID Tree of Best Splits on the Probability of Divorce within Five years of Marriage of Total Malay and Chinese Women Aged 25 years and over, Married before Age 25 Years, 1974 MFFS	196
5.6	AID Tree of Best Splits on the Probability of Divorce Within Five Years of Marriage, Malay women Aged 25 Years and over, Married before 25 years of Age, 1974 MFFS	198

Graph

6.1	Period Fertility Rate, 1958-1979, Peninsular Malaysia	213
6.2	Cohort Fertility Rate, Peninsular Malaysia	214

Fig.

6.1A AID Tree of Best Splits on Mean Children Ever Born of Malay Women Aged 25 Years and over who married before 25 years of Age 240

6.1B AID Tree of Best Splits on Mean Children Ever Born of Chinese Women Aged 25 Years and over who married before 25 years of Age 241

LIST OF APPENDIX TABLES

App.		Page
2.1	Percentage Distribution of Respondents by Type of Marriage Arrangements from Various Studies	87
3.1	Intermediate Variables Affecting Fertility (from Davis and Blake, 1956: 211-235)	109
3.2	A Measure of Cumulative Fertility (based on Boulier and Rosenzweig, 1978)	110
4.1	Proportion Literate of Malay and Chinese Males and Females by Age Groups in the 1970 Population Census	141
4.2	Percentage Distribution of Malay and Chinese Male and Female by Educational Level (in years) by Age Groups, 1957 and 1970 Population Census	142
4.3	Labour Force Participation Rates of Malays and Chinese by Age Groups and Sex, 1957 and 1970 Census	143
5.1	Mean Age at First Marriage of Malay and Chinese Currently Married Women Aged 25 Years by Current Residence, Childhood Residence, Migration Status, Education and Premarital Work Status for Various Birth Cohorts, 1966-67 MFS	206
5.2	Analysis of Variance of Age at First Marriage of Women Aged 25 years and over who Married before Age 25 Years, 1974 MFFS	207
5.3	Analysis of Variance of Age at First Marriage of Women (Malays and Chinese) Aged 25 years and over who Married before 25 Years, 1974 MFFS	208
5.4	MCA Results: Probability of Divorce within Five Years of Marriage of Malay Women Aged 25 Years and over, Married at least 5 years before the Survey, 1974 MFFS	209

6.1 Mean Number of Children by Malay and Chinese Women Aged 25 Years and over, Married Only Once and Married before the Age of 25 Years by Age at First Marriage (A), Education (E) and Birth Cohorts (C), 1974 MFFS 262

6.2 Hierarchical Log-linear Models Applied to Mean Children Ever Born by Age at First Marriage (A), Education Level (E) and Current Practice of Contraception (P), Currently Married Women 25 - 35 Years who Married before the Age of 25 Years, 1974 MFFS 263

7.1 Cumulative Proportion of Women (whose first marriage had dissolved) Having a First Birth by Selected Interval Lengths in Months since First Marriage by Selected Characteristics Using Life Table Technique, 1974 MFFS 312

7.2 Estimated Effects of Age at First Marriage (A), Education (E) and Migration Status (M) on the Timing of the Second Birth with or without control for Other Factors, 1974 MFFS 313

7.3 Estimated Effects of Age at First Marriage (A), Education (E) and Migration Status (M) on the Timing of the Third Birth with or without control for Other Factors, 1974 MFFS 314

CHAPTER 1

GENERAL BACKGROUND

1.1. INTRODUCTION

The purpose of this study is to investigate the relationship between nuptiality, that is, age at marriage, rates of divorce, remarriage and widowhood, and the proportion of people who ever marry, and fertility in Peninsular (West) Malaysia* during the years 1957 - 1980, a period in which fertility has declined while age at marriage has increased. If, as is often stated, contraception has not been widely and expertly practised until recently, according to the conventional natural fertility interpretation, marital postponement would lead to a smaller family size because the period of exposure to pregnancy is shortened (Henry, 1961).

Age at first marriage can be used as an approximate indicator of a woman's exposure to the risk of childbearing and is therefore an important determinant of fertility. In Malaysia, it is actually quite an accurate measure because premarital conceptions or first births form a negligible proportion of total births (see later chapters) and

---

*This study concentrates only on Peninsular Malaysia (for simplification, the term Malaysia will be taken to mean Peninsular Malaysia in the subsequent text) as its data quality is better and Sabah and Sarawak were separate entities before 1963. Furthermore, the entire area of Malaysia was covered for the first time in the 1970 Census. Other reasons for concentrating on Peninsular Malaysia, in addition to the problem of availability and comparability of data, are differences in socio-economic conditions, ethnic composition and history between East and West Malaysia.

marriages are consummated soon after marriage for most women, except those who married at very young ages. If there is a rapid change in nuptiality over a short period which simultaneously affects several cohorts, it is possible that there will be short-term changes in fertility trends which do not reflect the underlying long-term trend. This period effect has been referred to by Ryder (1964) as demographic translation. Delayed marriage would also lengthen the period between generations and, other things being equal, this would provide an independent brake on the rate of population growth in the long run (Coale and Tye, 1961). A later age at marriage also allows a woman a longer period for education as well as work and exposure to influences outside the home before marriage. This may influence, among other things, her family size desires and contraceptive use efficiency. On the other hand, a later age at marriage means more stable unions and thus a higher level of fertility. The thesis, therefore, attempts to examine the relationship between nuptiality and fertility in the context of socio-economic change over a period of more than twenty years.

On both practical and empirical grounds, the study concentrates on two main ethnic groups,[1*] the Chinese and the Malays, for comparing and contrasting this relationship. Data on the Indians will, however, be used for comparison wherever possible and relevant. The Chinese in Malaysia, like the Chinese elsewhere (see Taeuber, 1965), are experiencing rapid fertility decline. It has been shown that the Malaysian Chinese have experienced an earlier and greater fertility decline in recent years than the rest of the population (Cho and Kobayashi, 1979, Chap. 10). The Malays, however, show quite a different pattern. As stated earlier, the average family size for the

---

*This and subsequent numbers refer to notes at the end of each

Malays was smaller than that for the Indians or the Chinese in 1957. By 1970, the average family size for the Malays was the largest and for the Chinese the smallest. Also, the Malay proportion of the total population has increased with the Chinese proportion declining and the Indian proportion constant over the 1957 - 1980 period. It is interesting to note that these changes took place because, as far back as 1947, the age at first marriage for Chinese women was higher than that for the Indians or the Malays. The Indians and the other races, such as Europeans and Eurasians, are not included in this study because of the problem of the small sample size for these groups in the data sources to be employed.

The study concentrates on the period starting from 1957 for two reasons. The first reason is that birth rates started to decline around this time and the second reason is that the 1957 Census provides appropriate data for the commencement of the study period.

The study aims to use data from censuses and registration data as well as data from two surveys, the 1974 Malaysian Fertility and Family Survey (MFFS) and the 1966-67 West Malaysian Family Survey (MFS). The study starts with an overview of the changes that have taken place, not only in terms of marriage patterns and fertility, but also in terms of marriage behaviour and attitudes. With these changes in mind, the analysis first concentrates on the changes in nuptiality patterns of the various cohorts of Malay and Chinese women. Among other methods, the Coale-McNeil Model Nuptiality Schedule is fitted in this section using the 1974 MFFS data. In the second part, the analysis relates the changes in nuptiality patterns to the changes in

fertility trends or birth timing. Various multivariate techniques are used in the investigation of these effects, including the proportional hazards model (Cox, 1972; Kalbfleisch and Prentice, 1980).

It is relevant at this point to present some background information on Malaysia and describe briefly the trends in age at marriage and fertility. Malaysia (created in 1963 as a Federation) today consists of eleven states in Peninsular Malaysia (formerly known as Malaya) and the two states of Sabah and Sarawak. The eleven states in Peninsular Malaysia are Perlis, Kedah, Penang, Perak, Selangor, Negri Sembilan, Malacca, Johore, Kelantan, Trengganu and Pahang. The population comprises three main ethnic groups, namely Malays, Chinese and Indians.

The population of Peninsular Malaysia was estimated to be 4.9 million in the 1947 Census and 6.3 million in 1957. By the 1970 Census, it had risen to 8.8 million, and by the time of the 1980 Population Census it had climbed a further 2.6 million to 11.4 million. The Fourth Malaysia Plan projected the population to increase to 13.4 million in 1985.

In the late 1940s and early 1950s, the mortality rate commenced a sharp decline. The birth rate lingered at a high level until around 1957, after which it also went into decline. The number of annual births increased from 211 thousand in 1947 to about 290 thousand in 1957 and the number of annual births has fluctuated around 300 thousand since 1970. The number of annual deaths fell from over 90 thousand in the immediate postwar years to about 60 to 65 thousand annually for the 1960 to 1975 period.

In the 1970 Census, the population in the 0-14 age group was 44.6 percent of total population while the population in the 15-64 age group was 52.2 percent of the total. As a result of fertility decline, the Third Malaysia Plan projected that the 0-14 age group would fall from 41.4 percent of total population in 1975 to 39.2 percent by 1980. The 1980 Census estimated the proportion in this age group to be 41 percent. The population in the working age years of 15-64, on the other hand, was estimated to increase from 54.9 percent to 57.1 percent over this period. The 1980 Census estimated that 54 percent of the population was in the age group 15-59 years.

The Third Malaysia Plan projected the urban population to increase from 32 percent of total population in 1975 to 35.1 percent in 1980. This implied an annual growth of urban population of 4.6 percent over this period and one half of this increase was expected to be from rural-urban migration. It was also projected that over this period, the proportion of Malays in the urban population was likely to increase and the rate of increase of the Malay urban population would be higher than that for the Chinese or Indians.

This population trend is part of the social and economic changes that have occurred in Peninsular Malaysia. There has been a sharp decline in youthful marriage and childbearing over the past ten to fifteen years. In 1947, the mean age at marriage[2] for the Malay and Indian women was 17.5 years and it was over 20 years for the Chinese women. From 1947 to 1957, there was a slight trend towards delayed marriage among the Malay and Indian women but there was a considerable shift towards marital postponement among the Chinese women. In the

1957 - 1970 period, Malay and Indian women began to marry later. The mean age at marriage in 1970 was about 21 years for the Malay and Indian women and about 24 years for the Chinese women. In 1970, more than three quarters of the Malay and Indian teenage women and 94 percent of the Chinese teenage women were single. In 1980, about 90 percent of such Malay and Indian women and 95 percent of such Chinese women were single.

From 1957 to 1970 the Malay proportion of the total population increased from 49 percent to 53 percent while that of the Chinese fell from 38 percent to 35 percent. The Indian proportion remained at 10-11 percent of the total population over this period. The Third Malaysia Plan projected the racial composition of the population to remain very much the same in 1980.* The Malay gain was due to the higher natural increase for the Malays and the external migration of the Chinese. In 1957, the total fertility rates of the Chinese and Indians were higher than the Malay level. After 1960, the decline in fertility for the former two groups was so rapid that by 1975, the Malay total fertility rate was higher. Over the 1957 - 1980 period, the average completed family size by ethnic group also changed. In 1957, both the Chinese and the Indians had a larger average family size than the Malays. The Chinese had a smaller average completed family size in 1970 and 1980 than either the Malays or the Indians. It is pertinent to note that for the total population the proportion of women in the childbearing age, 15-44, did not change between 1957 and 1970. The proportion of Malays and Indians in this age group declined while the Chinese in this age group increased in relation to the total Chinese population. In 1980, for all the three racial

---

*According to the 1980 Census Report (1983:18), 55 percent of the population in Peninsular Malaysia were Malays, 34 percent Chinese and about 10 percent Indians.

Table 1.1

Population, Vital Rates, and Total Fertility Rates by Ethnic Group

Ethnic Group/ Year	Population ('000)	Birth Rate (per 1000)	Death Rate (per 1000)	Natural Increase (percent)	Total Fer -tility Rate (per 1,000 women)
Malays					
1957	3126	48.1	14.9	3.32	6,048
1970 (revised)	4841	34.1	7.3	2.68	5,210
1980 (revised)	6316	33.7	6.4	2.83	4,580
Percent Change					
1957-1970	+54.9	-29.1	-51.0	-19.3	-13.9
1970-1980	+30.5	-1.2	-12.3	+5.6	-12.1
Chinese					
1957	2334	43.3	9.8	3.35	7,340
1970 (revised)	3286	30.4	6.2	2.41	4,780
1980 (revised)	3865	25.3	5.5	1.97	3,310
Percent Change					
1957-1970	+33.8	-31.2	-37.8	-29.3	-34.8
1970-1980	+17.6	-16.8	-11.3	-18.3	-30.8
Indians					
1957	696	49.7	11.1	3.85	7,952
1970 (revised)	981	30.7	7.8	2.28	4,940
1980 (revised)	1171	29.7	7.1	2.27	3,590
Percent Change					
1957-1970	+40.9	-38.2	-29.7	-40.8	-37.9
1970-1980	+19.4	-2.6	-9.0	-0.4	-27.3
Total					
1957	6279	46.2	12.4	3.37	6,660
1970 (revised)	9182	32.4	7.0	2.54	5,015
1980 (revised)	11427	30.4	5.6	2.47	4,030
Percent Change					
1957-1970	+46.2	-29.9	-43.5	-24.6	-24.7
1970-1980	+24.5	-6.2	-20.0	-2.8	-19.6

Source: 1980 Vital Statistics (preliminary release)
1980 Census Report (1983:17,48)

groups, the proportion of such women indicates an increase over the 1970 figures. Some of these characteristics are presented in Table 1.1.

1.2. RESEARCH OBJECTIVES

The main objectives are:

(1) To carry out a systematic study of the relationship between nuptiality and fertility in Peninsular Malaysia;

(2) To compare and contrast the nuptiality and fertility behaviour of the two main ethnic groups, the Malays and the Chinese;

(3) To study the relationship between nuptiality and the timing of births;

(4) To study the time trends in age at marriage, age difference between spouses, the proportion married and the outcome of marriages in relation to time trends in fertility;

(5) To investigate the social changes that have occurred in relation to marriage customs and attitudes and how these changes have affected age at marriage, marital dissolution and fertility;

(6) To draw implications for general development planning.

1.3. REVIEW OF LITERATURE

1.3.1. STUDIES ON NUPTIALITY AND FERTILITY

The relationship between nuptiality and fertility was suggested in the Davis and Blake framework (1956) to operate on the level of the 'intermediate variables', that is one of the conditions through which

social variables must work to affect fertility. The marriage effect on fertility would mainly be through the 'intercourse variables' - age at entry into sexual union, permanent celibacy, periods of divorce, separation and widowhood. More recently, the proportion married was identified as one of the 'proximate' determinants of fertility (Bongaarts, 1978:106).

Matras (1965) noted the following pattern of interplay between marriage and fertility in the 'strategy of family formation' aimed at population control: (a) uncontrolled fertility and early marriage in traditional societies, followed by (b) uncontrolled fertility and late marriage, and then (c) controlled fertility and late marriage, as demonstrated by the historical experience of modern European societies, and, finally, (d) the traditional early marriage pattern with controlled fertility, as demonstrated in a number of modern societies in recent times. Coale (1974:70) further demonstrated that 'a Malthusian transition in which later marriage and fairly common spinsterhood replaced early and universal marriage', in the initial phase of the demographic transition, was followed closely by 'a neomalthusian transition in which marital fertility fell'. In a contracepting population, both transitions can take place simultaneously. Ryder (1967:30) specified four phases of the nuptiality-fertility relationship in the following sequence: (a) high nuptiality (that is low age at marriage and high proportions married) and high marital fertility; (b) low nuptiality and high marital fertility; (c) low nuptiality and low marital fertility; and (d) high nuptiality and low marital fertility.

AGE AT MARRIAGE AND FERTILITY

Marriage reduction, in terms of higher age at marriage and lower proportions married at different ages, has characterised the early demographic transition of many countries (see Coale, 1974; Coale and Tye, 1961; Hajnal, 1965; Smith, 1976; Yaukey, 1973). The decline in the crude birth rate in Peninsular Malaysia between 1960 and 1970 was also attributed largely to marriage postponement and a shift in the proportions married to higher ages (Cho and Retherford, 1974). The trend in fertility decline in Peninsular Malaysia up to about 1975 for the Malays was attributed wholly to rising age at marriage while for the Chinese and the Indians, it was supplemented by major declines in marital fertility (Jones and Sidhu, 1981a).

Delay in the age at first marriage can reduce the crude birth rate and population growth, even if completed family size is not reduced (rf. Coale and Tye, 1961; Heeren, 1974). Marital postponement will result in a delay of births to a later time and this delay will result in a lengthening between generations and hence slow population growth, even if completed fertility does not change.

At the individual level, the impact of delayed age at marriage upon fertility, however, depends upon whether the fertility is natural or controlled (Henry, 1976:91-95). Under conditions of natural fertility, the age at marriage determines the age at which a woman is exposed to natural fertility rates. Under conditions of controlled

fertility, the birth interval may be lengthened or shortened depending on the age at marriage of the woman relative to the other women in the society. A woman marrying later may display a 'catching-up' effect.

The relationship between age at marriage and fertility has been shown to be negative in the majority of studies; see, for example, Lesthaeghe, 1971; Palmore and Ariffin, 1969; Sinha, 1954; Agarwala, 1967; Basavarajappa and Belvalgidad, 1967; Bumpass, 1979; Freedman and Casterline, 1979; D'Souza, 1979; Coale et al., 1979; Henry and Piotrow, 1979; and McDonald et al., 1980. Among them, Sklar (1971) argued that the hypothesis of an inverse relationship between age at marriage and fertility is not an oversimplification. Late-marrying women have higher levels of childlessness and smaller completed families than early marrying women (Sklar, 1971:175). Busfield (1972), using British data, investigated several hypotheses relating age at marriage to family size and concluded that the relationship between age at marriage and family size is not entirely a 'spurious' one. The evidence from this study indicates that an important part of the association between age at marriage and family size is due to differences in the efficiency of fertility control. These observations on the relationship between marriage and fertility are based on the assumption that most births take place within marriage or some other relatively comparable stable union (see Yaukey, 1973:31-52). Studies carried out in Malaysia also indicate the importance of age at first marriage in affecting fertility (B.A. Tan, 1981; P.C. Tan, 1981b; unpublished study by the Malaysian National Family Planning Board).

It is not at all clear from all these studies whether the change in age at marriage is the result of a desire to have fewer children. McDonald (1981) has argued that an increase in age at marriage is not undertaken in order to reduce family size but rather in response to changes in the functions of marriage. Whatever the reason is for the increase in age at marriage, one cannot deny the fact that the increase in the age at marriage has occurred as part of the whole chain of social changes, such as change in the role of women, familial relationships, educational level and contraceptive acceptance, and this has effected fertility decline.

MARITAL STABILITY AND FERTILITY

The impact of marital breakdown/divorce on fertility is not clear. Other things being constant, marital breakdown would shorten the period of exposure to sexual union and should decrease the fertility of the women involved, especially if remarriage does not take place quickly. The negative effect of marital disruption on fertility was observed in a number of studies (see, for example, Carter and Glick, 1976; Palmore and Ariffin, 1969; Cohen and Sweet, 1974).

The effect of children on divorce is also not clear. Years ago, it was believed that the tendency for childless couples to divorce was very much higher than for couples with children (Nimkoff, 1934). Later studies, however, indicate that the difference in divorce rates between these two groups was not so great (Jacobson, 1950; Monahan, 1955). Becker (1973) suggested that the number of children in the

home might influence the possibility of marital dissolution, regardless of the age of the children. Cherlin (1977) in his study of women aged 30 to 44 found that the presence of children acted to lower the probability of marital dissolution only when the children were of pre-school age. These studies are of course very culture specific and may not apply to Malaysia.

1.3.2. STUDIES ON NUPTIALITY AND BIRTH TIMING

A number of studies which used birth interval data investigated the relationship between age at marriage and subsequent fertility. Among them, Ruzicka (1976) studied the interval between marriage and first birth using Australian data and found that the interval was relatively short for young women who were not pregnant at the time of marriage. Others with similar findings include Coombs and Freedman (1970), Bernhardt (1971) and Farid (1974). More recently, Trussell and Menken (1978) and Bumpass et al (1978) related the significance and importance of age and marital status at first birth to the pace of subsequent fertility. Early childbearing may also adversely affect marital stability (Bumpass and Sweet, 1972). Furthermore, the age of wives at first birth seemed to strongly influence the completed family size (Presser, 1971; Bumpass and Mburugu, 1977). P.C. Tan (1981a) found, using the 1974 MFFS data, that the interval from marriage to first birth was shorter for wives who had married recently.

1.3.3. STUDIES ON NUPTIALITY

As this study also investigates the factors affecting nuptiality, the review of some studies on this aspect is relevant.

Numerous factors have been found to affect the timing of marriage. Some of these factors are the degree of urbanisation, educational opportunities for women, female labour force participation, availability of mates, per capita income (see, for example, Henry and Piotrow, 1979; Caldwell, 1963; Dixon, 1971; Smith, 1976; Von Elm and Hirschman, 1979; Jones, 1979; Collver, 1968; Mitchell, 1971). Age at marriage has been found to be consistently higher for urban than rural women and for the better educated than the less educated (Concepcion, 1980; Notestein, 1931; Glick and Landau, 1950; Palmore and Ariffin, 1969; Mitchell, 1971; Bogue, 1969).

A number of studies have examined the effects of social and economic factors on nuptiality. Hajnal (1965), in a study of the history of nuptiality, found trends of late age at marriage and high proportions remaining single in Western Europe. Nuptiality in Eastern Europe, on the other hand, was early and quasi-universal, not unlike the pattern that exists in a number of developing countries. The trend towards lower nuptiality in Western Europe was a function of economic requisites and social prohibitions (Coale, 1969; Hajnal, 1965). Marriage may be postponed until better times in periods of depression while during periods of prosperity, with increased labour demand and higher expectation of income, younger marriages may result. It has also been observed by Dixon (1971) and Hawthorn (1970) that

extended family systems are conducive to early marriage. Arranged marriages are also postulated to occur earlier (Blake, 1965; Dixon, 1973). Heer (1966) argued that while economic growth may initially result in decline in age at marriage, ultimately postponement of marriage would result. In Asia, so far, economic growth seems always to be associated with rising age at marriage (see, for example, Smith, 1976).

Marriage decisions have also been mentioned as having an effect on the timing of marriage. Dixon (1970:5) identified three conceptual categories affecting marriage. They are:

(a) availability of mates, delimited essentially by the sex ratios in the marriage market (including pertinent age groups and segments of the social structure);

(b) feasibility of marriage - conditioned inter alia by financial constraints and considerations, and

(c) desirability of marriage in terms of relative rewards and penalties of marriage or non-marriage and time frames involved, nature of social and institutional alternatives and/or other functions that marriage is desired to fulfil such as childbearing and rearing.

Fawcett (1974:21-24) referred to three kinds of marriage decisions - whether to marry, when to marry and whom to marry while Sklar (1971) explained marriage decisions and age at marriage in terms of socioeconomic costs and benefits involved. Others, such as Bumpass (1969), emphasised the importance of non-familial roles as viable alternatives to marriage while Becker (1973-74) applied economic theory to explain marriage. Stone (1977) referred to three motives of marriage - economic, social and personal. Other variables which have

been studied in relation to marriage include age (for example, Glick and Landau, 1950), marital status (for example, Bernard, 1956; Bowerman, 1953), ethnicity (for example, Von Elm and Hirschman, 1979), socio-economic class and residential propinquity (for example, Bossard, 1932) and social organisation (for example, McDonald, forthcoming).

In Peninsular Malaysia, the increase in age at marriage has been attributed to changes in the sex-ratio, especially among the Chinese (Caldwell, 1963), and to urbanisation and widespread gains in education (Palmore and Ariffin, 1969; Lee, 1981). Women who married at younger ages were more likely to marry two or more times (Palmore and Ariffin, 1969) while education was found to have a significant negative effect on the number of times a woman married (Tan and Siti, 1981). Between 1947 and 1970, Jones (1980) found that the divorce rates of Malays in Peninsular Malaysia have declined.

1.4. LAWS AND CUSTOMS OF MARRIAGE AND DIVORCE

In Malaysia, marriages can be validly performed under either customary law or statutory law. It is important to note that laws relating to non-Muslims and non-natives are a Federal responsibility but Muslim laws and the Native Customary Law are within the jurisdiction of the states. Thus, except for the Federal Territory of Kuala Lumpur which is under the jurisdiction of the Federal Government, Muslim laws can only be amended with the consent of the states in Malaysia.

1.4.1. CUSTOMARY AND STATUTORY LAWS IN GENERAL

MARRIAGE

In the past, marriage under customary law for the Chinese was primarily polygamous. The courts recognised such polygamous unions as long as they were consensual. There was no legal requirement to register such marriages. For the Indians, monogamy was accepted as the customary rule for some sections while others were allowed polygamous unions.

Under statutory law, there were until recently three statutes related to marriage of non-Muslims in Peninsular Malaysia. They were:

(i) The Registration of Marriages, 1952;

(ii) The Civil Marriage Ordinance, 1952;

(iii) The Christian Marriage Ordinance, 1956.

The Registration of Marriages, 1952, provided for the registration of all marriages solemnised or contracted unless one party was a Muslim or Christian at the time of marriage; the Muslim law or the Christian Marriage Ordinance, 1956, whichever was relevant, then applied. The main objective appeared to be to enable customary marriages to be registered if desired. The Civil Marriage Ordinance, 1952, allowed a non-Muslim to contract a monogamous civil marriage. The Ordinance also stipulated a minimum age at marriage of 16 years for the male and a minimum of 14 years for the female. It also contained provisions concerning the requirement of parental consent and certain prohibitions of marriage. The provisions of the Christian Marriage Ordinance, 1956, were substantially similar to the Civil Marriage

Ordinance.* It is interesting to note that there was no provision to prevent a person, married under this Ordinance, from contracting further customary marriages.

Under the Civil Marriage Ordinance, 1952, and the Christian Marriage Ordinance, 1956, parental consent or the consent of the guardian was required for a minor@ who had not previously married. The minor might apply for the consent of the court if parental consent was withheld or impossible to obtain.

Under the present Law Reform (Marriage and Divorce) Act, 1976,** a minimum age at marriage of 18 years is specified but there are provisions for the State Authority to grant dispensation to a female who has reached 16 years of age. The Law Reform (Marriage and Divorce) Act, 1976, also abolishes polygamy for non-Muslims in Malaysia.

---

*The minimum age at marriage can be dispensed with by a licence granted by the Church Authority.

@The age of majority was reduced from 21 to 18 years by the Age of Majority Act, 1971.

**This act has been enacted and was enforced on March 1, 1982. The Act was proposed after a Royal Commission in 1970, which found that public opinion was overwhelmingly in favour of the abolition of polygamy. The Act applies to only non-Muslims (excluding the aborigines of Peninsular Malaysia) and does not affect the validity of marriages solemnised under any law, religion or custom prior to the appointed date. Under this Act, all marriages would have to be registered and any future marriages would be solemnised only by a Registrar. A person under 21 has to obtain a written consent from his/her father (or mother if the father is dead) or guardian. The court can give consent if consent is being unreasonably withheld or if there is no one to give a written consent. Permission is not required, however, if the minor has previously married.

On the eve of the day the Law Reform (Marriage and Divorce) Act, 1976, was to come into effect, the New Straits Times newspaper (Feb. 28, 1982:2) published five case studies of non-Muslim men who had married more than one wife under various laws or were keeping more than one woman. Apparently there is much confusion as to how the Act will be administered in practice and the following extract from the above article illustrates this:

> Mrs X has had a number of shocks lately - to be exact, she has had three. Early this year, she discovered that her supposedly busy, but faithful husband, has a second wife plus three children. She did not confront him initially but hired a private investigator..... The first week he discovered a third Mrs X, with two children and the following week came up with a fourth Mrs X, with three offsprings. Mrs X flew into a rage and Mr X never knew what hit him when he entered the door from 'a business trip'..... Finally Mr x took the easy way out - he ran away from home. Now Mrs X is a very worried lady..... Mr X married all the four women under Chinese customary law.

Under Muslim law, a man is permitted to have four wives under certain conditions. One of the conditions is that he must be able to give equal treatment to all his wives. Under the Shafii School of Muslim Law, which is followed in Malaysia, the consent of the wali (certain male relatives) is required for marriages of all females. The consent of the kathi, a religious official in charge of Islamic affairs in the district, as the wali hakim (guardian for the purpose of marriage) is sought in cases where consent of the wali is withheld or impossible to obtain. For Muslims in Malaysia, there is at present no minimum age of marriage. Marriage is allowed once puberty is attained or on completion of 15 years of age. Under the Shafii School of law, a girl under the age of puberty can only be given in marriage

by her father or grandfather. No proposal has been made to abolish polygamy for Muslims. It has been suggested that a Muslim be allowed to marry a second wife only with the consent of the kathi or the Shariah Court. A bill to amend the Administration of Muslim Law Enactments has been drafted but awaits the approval of the Conference of Rulers (Ahmad, 1977:50).

DIVORCE

Under the old Ordinances and under the Law Reform (Marriage and Divorce Act, 1976), certain provisions are made for annulment or divorce of non-Muslims. Under the old ordinances, no petition can, in general, be presented within three years of marriage. Under the Law Reform, this period is reduced to two years. Under the Law Reform (Marriage and Divorce) Act, 1976, which mainly followed the provisions of the Nullity of Marriage Act, 1971, a marriage is considered void on the following grounds:

(a) at the time of the marriage either party was lawfully married and the former husband or wife of such party was living at the time of the marriage and such marriage is in force;

(b) either party is under the age of eighteen years, unless special licence has been granted;

(c) the parties are within the prohibited degrees of relationship.

In addition, a marriage that takes place after the commencement of the Law Reform Act is void on the following grounds:

(a) the marriage has not been consummated owing to the incapacity of either party to consummate it or the wilful refusal of one party

to consummate it;

(b) either party to the marriage did not consent to it, whether in consequence of duress, mistake, unsoundness of mind or otherwise;

(c) at the time of the marriage either party was suffering from mental disorder of such kind or to such an extent as to be unfit for marriage;

(d) at the time of marriage either party was suffering from venereal disease in a communicable form;

(e) at the time of the marriage the woman was pregnant by some other person.

Under the Act, a marriage that is annulled because it is void is considered as a marriage up to the point that the decree of nullity comes into operation and is therefore not different from a marriage dissolved by divorce.

The sole ground for divorce under the Law Reform (Marriage and Divorce) Act, 1976, is that the marriage has irretrievably broken down, which includes

(a) one party has committed adultery and the other party finds it impossible to live together under the circumstance;

(b) one party behaves in such a way as to make it impossible for the other party to live together;

(c) one party has deserted the other for a continuous period of at least two years immediately preceding the presentation of the petition;

(d) the parties concerned have lived apart for a continuous period of at least two years immediately preceding the presentation of the petition;

(e) joint petition by mutual consent of both parties.

Attempts at reconciliation are encouraged where possible, before a divorce is granted.

Under the Islamic Law, the marriage contract can be terminated by legal action taken by the husband or the kathi. A Muslim husband can divorce his wife by talak at his own will without intervention of the court, by mutual consent or by judicial decree through annulment or dissolution. A talak divorce is one in which the husband informs his wife, either verbally or in writing, of his intention to divorce her. If he says so once, it is a one talak divorce, and this can be revoked by mutual consent during the hundred days* of the edah, during which a divorced woman is forbidden to marry another person. Revoking a divorce is called rujuk. A triple talak divorce cannot be revoked and neither can a single talak divorce after the expiry of the edah. If the divorce is by triple talak, marriage can only take place again after the wife has first consummated marriage with another man. This rule is evaded by marriage to a man known as a muhallil or china-buta who is paid a certain amount of money, and obtaining a quick divorce from him. Three one talak divorces add up to a triple talak divorce, that is the last divorce is irrevocable. Within seven days of the divorce, the husband has to report the divorce to the Registrar of the locality in which the divorce took place.** If the divorce cannot be

---

*For a younger woman, this period may be until the cessation of the third menstrual period, or, if she is pregnant, until her delivery.

**Various state enactments require that every effort be made at reconciliation before a talak divorce is registered. It also differs across states whether the presence of the wife or the kathi is necessary for the registration of a divorce.

revoked, the Registrar then issue a certificate of divorce, one for the husband and one for the wife. If the divorce can be revoked, that is if only one or two talak were pronounced, the certificate of divorce is not issued until the expiration of the period of edah. If the husband decides to revoke the divorce, he must report the revocation of divorce to the Registrar, who has registered his divorce, within seven days of the revocation. Before the Registrar makes a note of the revocation, he has to satisfy himself that the divorce has been lawfully revoked.

A Muslim wife can apply to the kathi for a cerai taalik, or divorce by redemption or conditional divorce,* or a fasah divorce, or divorce by judicial decree, or divorce by kholo, or cerai tebus talak. The kathi, on receiving an application for a cerai taalik or a fasah divorce from a wife, then serves a notice upon the husband or, if it is not possible, on his nearest relative. If this is not possible, the notice is dispensed with. A divorce is granted if the kathi is satisfied with the reasons for the application of the divorce, usually supported by sworn statements of the wife and of at least two witnesses, and if the provisions of the Muslim law are complied with. The kathi issues a certificate of divorce to both husband and wife.

---

*This is the divorce resulting from the breaking of the condition that a husband has agreed and attested to on the solemnisation of the marriage. The condition is stated on the surat taalik at the end of the marriage certificate. The usual form of taalik is the condition that a wife has the right to seek for a divorce if the husband fails to maintain her for a period of 3 to 4 months or if he absents himself for 6 months on land or a year at sea without sending any letter or money to the wife.

A kholo divorce or the cerai tebus talak is a divorce by compensation of the wife to the husband in return for marital release. The wife initiates this by applying to the kathi and offering to pay compensation to her husband. According to the Shafii School, the husband's consent is necessary for a divorce to take place. If the husband decides to accept the compensation, the release of marital rights would be by a talak and it would be complete and irrevocable on its pronouncement. This type of divorce is provided for only in certain states; they are Kelantan, Trengganu, Pahang, Penang and Kedah.

Under customary law, it was possible for a Chinese husband in Peninsular Malaysia to divorce his wife in accordance with the Chinese custom of public announcement, which required no application to a court. Under the Law Reform (Marriage and Divorce, Act, 1976), this method of divorce is not recognised; the only way of terminating a marriage is through a judicial divorce.

In the next two sections, the customs relating to prohibitions of marriage for the Malays and the Chinese will be discussed. Customs relating to engagement and the actual wedding ceremony will be discussed in the next chapter.

1.4.2. MALAY MARRIAGE CUSTOMS

There are two types of adat or customs followed by the majority of Malays in Peninsular Malaysia. They are the Adat Perpatih and the Adat Temenggung. The Adat Perpatih, which originated from

Minangkabau, is practised in Negri Sembilan and certain areas of Malacca such as Naning and Alor Gajah. In other areas of Peninsular Malaysia, in particular Perlis, Kedah, Perak, Selangor, Johore, Kelantan and Trengganu, the Adat Temenggung is practised.

The Adat Perpatih is completely matrilineal and more characteristic and rigid than the Adat Temenggung. The marriage system under the Adat Perpatih is a system of exogamy within their tribes. This means that preference is for a person to marry outside the clan but within the tribes. It is also matrilocal, that is, it is compulsory for a husband to live in the wife's place, if not with the wife's family. The prohibitions of marriage include not only the prohibitions of hukum Islam but also the prohibitions of Adat Perpatih, as stated by Mohd. Din (n.d.(b):44):

> Thus while the children of brothers of the same father may intermarry in Islam, marriage between parallel cousins* through the same grandmother is not allowed in custom. Thus the scope of marriage prohibition is enlarged by prohibiting intra-tribal marriage due to the presence of common female blood..... Custom is insistent that the parties of the marriage should be of the same generation. Thus marriage is arranged preferably between cross cousins** of the first or second degree. It is most common between mother-brother's children for this relationship is permitted by both custom and Islamic Law.

Mohd. Din (n.d.(b):40) also wrote the following about the Adat Perpatih:

> The Perpatih tradition had made it an institution whose rules and rituals do more than merely bring individual parties to a lawful union. Marriage is the institution through which the whole host of relations and tribal organisations are bound into a cohesive whole.

---

* According to Mitchell (1975: 129), parallel cousins are first cousins whose related parents are of the same sex, for example mother's daughter or son and mother's sister's son or daughter. Sometimes the term ortho-cousin is used instead.

** Cross cousins are the children of siblings of opposite sex. Thus an individual's mother's brother's children and his father's sister's children would both be his own cross-cousins (Mitchell, 1975:46).

The conflict between Adat Perpatih and Islam concerning marriage relates to the following, as stated by Mohd. Din (n.d.(a):25-26):

> In a customary marriage, it is forbidden to take another wife within the same tribe..... Custom thus reduces the incidence of polygamy and encourages monogamy. Islam on the other hand allows plurality of wives and marriage is understood as being only a legal contract in Islam, which also does not insist on such meticulous rituals to validate a marriage..... . Islam is not concerned with the problem of plurality of wives in a matrilineal tribe as Islam is patrilineal-thus only would polygamy occur.

This conflict is also clear from the following (taken from Mohd. Din (b):26):

> In the matter of divorce, Islam has, in its practical day-to-day application in Malaysia, simplified the matter to the detriment of the female..... . A husband needs only to pronounce three talak and a Muslim marriage is dissolved. In the majority of cases an enquiry is not even held by the kathi in his capacity as Registrar of Muslim marriages..... Custom ordains that before a divorce takes place there should be due deliberation on the reasons for the intended dissolution. There must be cogent and sufficient reason for doing so; failure of love alone does not always suffice. Custom demands that a husband who contemplates divorce from his wife must go through an arbitration called bersuarang or 'settlement'.

The Adat Temenggung, which is said to have originated from Palembang, South Sumatra, Indonesia, is patrilineal in character (Mohd. Din (b):34). The marriage system is a system of endogamy although, like the marriage system under Adat Perpatih, it is very much influenced by Islam. The marriage prohibitions, in fact, follow fully the prohibitions of hukum syarak (Islam). Examples would include:

(1) A Muslim man may marry a Christian or a Jewess but not an idolatress. He may also be married to four women simultaneously. A Muslim girl, on the other hand, can only marry a Muslim and can only have one husband at a time.

(2) A man may not marry his mother, grandmother, daughter, granddaughter, sister, parent's sibling or sibling's child; his

present wife's mother, grandmother, daughter, granddaughter, sister, parents' sibling or sibling's child; a women related to him in any of these degrees through fosterage; a widow or divorced wife of his father, grandfather, son or grandson; a woman whom he has talak (divorced) three times unless she has remarried and been divorced.

(3) A widow or a janda (a woman whose marriage has been terminated or annulled) can only be legally married again after a period of three months and ten days or edah from the day of her husband's death, her divorce, or from the day after the dissolution or annulment (fasah) of her marriage by judicial decree. The janda can, however, marry the husband from whom she was last divorced during the period of edah if she has not been divorced by three talak. After edah, the widow or janda must produce a certificate of death of her late husband or a certificate of divorce, or the surat cerai or any certified evidence, whichever is appropriate.

At the present time, marriage is increasingly based on romantic love and the customs are not fully followed in every case. But the Malays are, compared with the Chinese, believed to be more traditional in this respect.

1.4.3. CHINESE MARRIAGE CUSTOMS

Until the beginning of the present century, the 'ideal' Chinese family was 'patriarchal, patrilineal, patrilocal, extended, located within the broader social organizational form of clan and sib, and integrated within a system of ethico-religious belief centering around

ancestor worship' (Yeh, 1969:3-4). A man's duty was first and above all to his parents and a married woman's duty was primarily towards her parents-in-law. The essence of marriage was a social arrangement between two families and the main family function was perpetuation of lineage. Two persons of the same surname were not allowed to marry unless they were at least five generations removed.

Parallel cousins who had the same surname were not allowed to marry but those with different surnames could do so. Marriage between a girl and her father's sister's son was a traditionally preferred type of cross-cousin marriage. However, marriage was taboo between a boy and his father's sister's daughter as it was believed that the female had only her mother's blood.

Considerations of marriage arrangements took into account the social standing of the family, moral prestige, the man's integrity and ability or the woman's willingness to serve her parents-in-law and the capacity to bear children (Yeh, 1969:7-8). Marriage within the clan was prohibited. Also prohibited were marriages which violated the generation-age order, marriages with persons of exceedingly low social status and those resulting from adultery. In the past too, polygamous marriages and mistresses were common. Also, the bride usually lived in the home of the groom after marriage.[3]

Today, first cousins are not encouraged to marry. Other than that there are few restrictions. Male authority has also declined and with economic independence, women are gaining recognition as individuals. Marriage is becoming not just a social arrangement and is more based on romantic love. Family ties are also not so strong and many Chinese couples now live on their own.

ADDITIONAL NOTES (CHAPTER 1)

Page numbers in brackets at the end of each note refer to the relevant page in the text of the thesis.

[1] In this thesis, the terms, ethnic group, race and community, are synonymous. All these terms have been used and are being used synonymously in various government publications. For example, in the Fourth Malaysia Plan, all these terms are used. The term 'ethnic group' was used for the first time in the 1980 Census (1983:16). (p. 2)

[2] The figures refer to the singulate mean age at marriage (Von Elm and Hirschman, 1977). (p. 5)

[3] It is not clear how widely the 'ideal' described in the previous three paragraphs was actually practised. Evidence provided in Palmore et al. (1970) suggested that even in China, the simple conjugal family was the most common. In Peninsular Malaysia, the majority of the Chinese population during the nineteenth and early twentieth centuries consisted of immigrants who were young single men or married men who left their families behind with the idea of ultimately returning home or of later bringing their families to Malaysia. Hence, Palmore et al. (1970: 393) suggested that extended family participation would be limited as a result of the limited availability of appropriate marriage partners as well as relatives, many of whom remained in China. (p. 28)

CHAPTER 2

AN OVERVIEW OF MARRIAGE PATTERNS, ATTITUDES AND THEIR RELATIONSHIPS TO FERTILITY TRENDS

The aim of this chapter is to present an overall picture of the nuptiality changes that have occurred, how these changes are affected by changes in attitudes and how they in turn seem to affect the level of fertility. Published data from various sources are used in an attempt to provide a background picture to the study.

2.1. TRENDS IN NUPTIALITY

The marital structure of the female and male population (over 15 years of age) indicates a trend towards a higher proportion single and lower marital disruption caused by widowhood and divorce (rf. Table 2.1) but for any meaningful interpretation, one has to look at the marital structure by age. At any point in time, the proportion married at various ages depends on:

(1) the age pattern of marriage, that is the age at first marriage and the number ultimately marrying;

(2) the frequency of marital disruption caused by divorce or widowhood;

(3) the number of remarriages of those widowed or divorced;

(4) differential mortality or migration by marital status but this effect will be very small.

The first section therefore concentrates on the first three aspects of nuptiality patterns.

Table 2.1

Current Marital Structure of the Female and Male Population Aged 15 Years and Over (Percentage Distribution)

Current Marital Status	1947 Census	1957 Census	1966-67 MFS	1970 Census	1980 Census
Female					
Single(never married)	14.7	16.3	24.6	26.0	30.5
Married	65.8	66.9	60.8	61.0	58.2
Widowed	19.5	13.3	12.3	11.5	9.2
Divorced/separated	0.0	3.5	2.3	1.5	2.1
Total	100.0	100.0	100.0	100.0	100.0
Male					
Single(never married)	35.0	32.2	35.3	36.7	39.7
Married	59.1	63.0	60.9	59.3	57.5
Widowed	5.9	3.3	2.8	2.9	2.1
Divorced/Separated	0.0	1.5	1.0	1.1	0.7
Total	100.0	100.0	100.0	100.0	100.0

MFS West Malaysian Family Survey

2.1.1. THE AGE PATTERN OF MARRIAGE

After the Second World War, there was evidence of marriage postponement. This trend in the age pattern of marriage is reflected in the increasing proportion of women remaining single in the younger ages (see Table 2.2). For women, the change in the proportion single in the 15-24 age group seemed to have accelerated between 1957 and 1970 but slowed down between 1970 and 1980. If this increase is broken down by racial groups, it is noticeable that in 1947 and 1957, more than half the Malay and Indian women were married at the age of 15 to 19 years and marriage was almost universal in the age group 20-24 years. By 1970, however, marriage postponement had accelerated such

that 77 percent of the Malay women and 83 percent of the Indian women in the age group 15-19 years were still single. In 1980, the proportions of single Malay and Indian women in the age group 15-19 years were 89 percent and 91 percent respectively. Some reasons that can be suggested for the increase in age at first marriage of women between 1947 and 1980[1] are (i) increasing education; (ii) increased labour force participation; (iii) lack of economic support to begin family life as there was high unemployment in the younger ages; (iv) more self-arranged marriages and less parental say in the choice of marriage partners, as is shown later in this chapter.

The Chinese women had always married later than either the Malay or Indian women. The already large proportion of Chinese women remaining single in the age group 15-19 years increased further over the 1947 - 1980 period. For those in the 20-24 age group, the proportion of single Chinese women more than doubled from 26 percent in 1947 to 60 percent in 1957. In 1980, the proportion of single Chinese women in this age group increased to 63 percent. Some reasons that can be suggested for the later age at first marriage of the Chinese women between 1947 and 1957 are (i) the Colonial government's resettlement programme in the early 1950s which moved hundreds of thousands of rural residents, largely Chinese, into 'new villages' that became small towns or were adjacent to larger towns (Sandhu, 1964:177); (ii) a sizable exodus of young Chinese men who during the early 1950s emigrated to China (Caldwell, 1963:21).

Table 2.2

Indicators of Trend in Nonmarriage by Race for Females and Males in Peninsular Malaysia Since 1947

Sex/Race/Indicator	1947 Census	1957 Census	1970 Census	1974 MFFS	1980 Census
Females					
Malays					
Percent single					
15 - 19	40.8	45.9	77.3	83.3	89.0
20 - 24	6.6	9.4	32.4	40.4	49.0
Percent Never Marrying*	1.4	0.6	0.7	0.0	0.0
Chinese					
Percent single					
15 - 19	82.4	89.7	94.0	94.6	95.0
20 - 24	26.1	43.1	59.7	57.6	63.0
Percent Never Marrying*	3.7	2.5	2.4	1.8	3.0
Indians					
Percent single					
15 - 19	47.7	46.8	83.0	92.3	91.0
20 - 24	6.9	9.4	37.0	45.0**	55.0
Percent Never Marrying*	1.6	0.6	0.9	0.0	2.0
Total					
Percent single					
15 - 19	57.8	63.0	83.9	89.0	92.0
20 - 24	13.3	21.4	43.0	50.0	54.0
Percent Never Marrying*	2.5	1.4	1.3	n.a.	2.0
Males					
Malays					
Percent single					
15 - 19	93.2	92.1	96.3	n.a.	99.0
20 - 24	53.7	47.2	67.7	n.a.	80.0
Percent Never Marrying@	2.1	1.8	1.2	n.a.	1.0
Chinese					
Percent single					
15 - 19	97.6	98.6	98.3	n.a.	99.0
20 - 24	77.0	79.1	86.3	n.a.	88.0
Percent Never Marrying@	20.6	11.4	5.0	n.a.	5.0

(cont'd Table 2.2)

Indians					
Percent single					
15 - 19	98.4	96.8	97.1	n.a.	99.0
20 - 24	80.3	67.4	75.4	n.a.	82.0
Percent Never Marrying[@]	15.2	8.9	4.9	n.a.	4.0
Total					
Percent single					
15 - 19	48.8	95.2	97.2	n.a.	99.0
20 - 24	32.4	62.3	75.4	n.a.	83.0
Percent Never Marrying[@]	6.4	7.1	3.0	n.a.	4.0

[*] Percent still single aged 45-49, except the 1980 Census, where the figures are for those aged 45 years and over

[@] Percent still single aged 50-54, except the 1980 Census, where the figures are for those aged 45 years and over

[**] at age 50-54, 1.4 percent had never married

n.a. not available

Sources: Censuses
Jones, 1980, Table 2
Chander et al., 1977:58

The pattern for the Malay and Chinese men is similar to that of the women (rf. Table 2.1). A higher proportion of men were single at younger ages in 1970 or 1980 than in 1957 or 1947 and the Chinese men married later than the Malay men (rf. Table 2.2). For the Indian men, the proportion single in the younger ages declined from 1947 to 1957 but rose between 1957 and 1980. The trend for the Indian men was caused mainly by the changing availability of marriage partners. An increase in the proportion marrying in the younger age groups for the Malay and Indian men in 1957 may be a result of the affluent years of the Korean War rubber boom. Such a trend is not shown for the Chinese men probably because they generally marry later.

AGE AT FIRST MARRIAGE

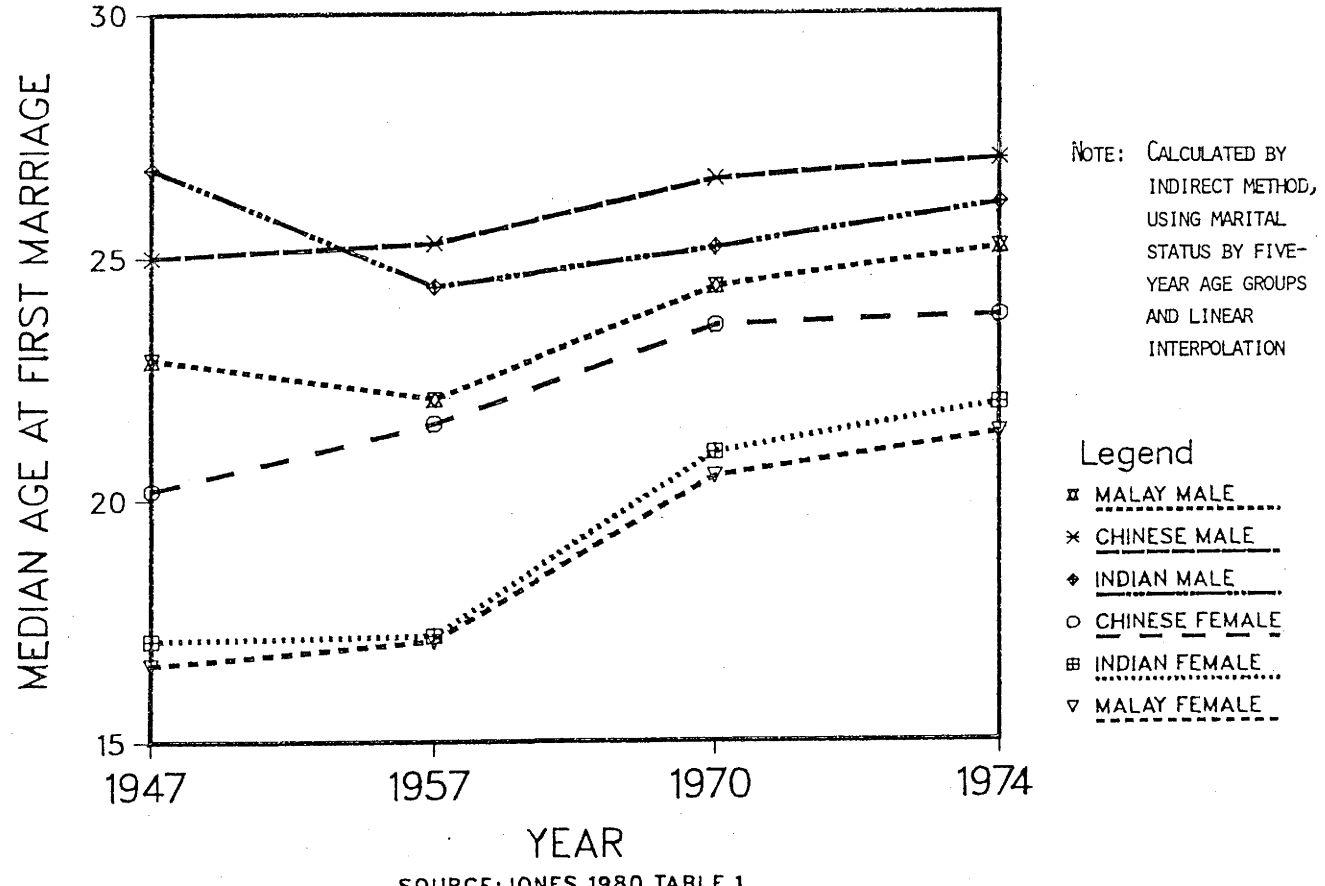
As the vital statistics on age at first marriage do not cover all marriages, one has to look at the trend in age at first marriage based on census data. The median age at first marriage was highest for the Chinese women, followed by the Indian and then the Malay women (rf. Figure 2.1). In 1947, teenage marriages were fairly common for all races. However, by 1957, the Chinese women married at the median age of 21.6 years while for the other races, the median age at marriage remained around 17 years of age. The 1970 census recorded an increase in median age at marriage for all races. This trend of increase seems to have levelled off by 1974 for all races.*

The trend of age at first marriage prior to 1974 can be observed from the retrospective data on marriage age collected in the 1974 MFFS. If the trend had been towards a later age at first marriage, the relationship between age and age at marriage would be an inverse one. As observed from Table 2.3, about 10 percent of the women of age 25-29 years (who were married before age 25 years) were married before 15 years of age compared with about 27 percent of women of age 45 years and over. At the other end, about 23 percent of those 25-29 years were married at 22-24 years of age compared with 10 percent of those aged 45 years and over.

---

*The 1980 Census Report (1983:45) indicates that the median age at first marriage increases across birth cohorts for both the Malay and Chinese women.

FIGURE 2.1:MEDIAN AGE AT FIRST MARRIAGE BY RACE 1947–1974



SOURCE:JONES,1980,TABLE 1

Table 2.3

Percentage Distribution of Age at First Marriage Among Women Aged 25 Years and Above and Married before 25 Years of Age

Current Age	Age at First Marriage					
	All ages	lt 16	16-17	18-19	20-21	22-24
25 - 29	100.0	9.9	27.0	18.6	21.3	23.2
30 - 34	100.0	15.2	30.5	20.1	14.7	19.5
35 - 39	100.0	20.6	35.0	19.7	12.5	12.2
40 - 44	100.0	19.5	38.6	22.4	9.7	9.8
45 and over	100.0	26.9	34.8	17.7	10.3	10.3

lt less than

Source: Chander et al., 1977:57

Another independent source also supports this evidence of an increasing trend of age at first marriage of women. The 1966-67 Malaysian Family Survey (MFS) reported the mean age at first marriage for the age groups, 15-24, 25-34 and 35-44, as being consistently lower than the same age groups in the 1974 MFFS* (see Table 2.4). Mean age at first marriage was also higher in the 1974 MFFS than the 1966-67 MFS for the Malay and Chinese women in different education groupings.

For the men, the median age at first marriage (rf. Figure 2.1) seems also to be rising although the increase is not as great as for females.** This has resulted in a drop in the median age difference

---

*For the 15-24 age group, the estimate of the mean age at first marriage may be biased by truncation.

**The 1980 Census Report (1983:45) also indicates an increase in Malay and Chinese male age at first marriage across birth cohorts.

Table 2.4

Mean Age at First Marriage by Current Age, Education Level and Race for Currently Married Women Less Than 45 Years of Age

	1966-67 MFS	1974 MFFS
Current Age		
15 - 24	16.6	17.9
25 - 34	17.8	19.5
35 - 44	17.5	18.8
Race/Education Level		
Malays		
No education	15.9	16.4
1-6 years	16.3	17.7
7+ years	19.5	20.3
Chinese		
No education	19.8	20.3
1-6 years	20.2	21.3
7+ years	22.7	23.3

Note: The figures in the category 15-24 are misleading because of censoring

Source: Chander et al., 1977:57
1966-67 West Malaysian Family Survey
1974 Malaysian Fertility and Family Survey

Table 2.5

Difference (in years) between Median Age at Marriage of Men and Women by Ethnic Group, Peninsular Malaysia, 1957 and 1974

Year	Malays	Chinese	Indians
1957	5.0	3.7	7.2
1970	3.9	3.0	4.2
1974	3.8	3.2	4.1

Source: Jones, 1980, Table 4

between spouses to 3-4 years in 1974 (rf. Table 2.5).

PROPORTION ULTIMATELY MARRYING

The proportion of women ultimately marrying (rf. Table 2.2) seems to be increasing although the trend between 1957 and 1970 was not definite.* The percent never marrying in the age group 45-49 fell for all races. However, if one looks at the younger age groups, 30-34 and 35-39, one finds that the proportions single in these age groups were rising between 1957 and 1974. This may indicate a trend towards a rising proportion remaining single in the future.

The proportion of men ultimately marrying seems also to be increasing. This is most noticeable for the Indian and Chinese men but not for the Malay men because the percent ultimately not marrying was already relatively small.[2]

2.1.2. MARITAL DISRUPTION

Vital registration on marital disruption is not comprehensive and again one has to rely mostly on evidence from censuses and surveys. However, vital statistics are used where available.

DIVORCE

The percentage of first marriages which terminated in divorce was very much higher for the Malays than the Chinese (rf. Table 2.6). For example, for those married for 15 years or more, 26 percent of Malay

---

*It is still too early to tell whether the shift in the timing of marriage would lead to an increasing tendency for women to remain single.

marriages terminated in divorce compared with about 4 percent of

Table 2.6

Percentage Distribution of Malay and Chinese Ever-married Women by Status of First Marriage by Years since First Marriage

Race/ Years since First Marriage	First Marriage Undissolved	First Marriage dissolved by Husband's Death	Divorce	Not Stated
Malays				
<5	92.3	0.9	6.8	-
5-9	85.3	1.7	12.8	0.2
10-14	76.9	3.9	19.0	0.2
15+	62.1	11.5	26.2	0.2
Total	73.4	7.0	19.5	0.2
Chinese				
<5	99.4	-	0.6	-
5-9	98.0	0.9	1.1	-
10-14	95.7	2.0	2.3	-
15+	85.2	11.1	3.7	-
Total	92.8	5.0	2.2	-

< less than
- no case
Source: 1974 MFFS

Chinese marriages. The ratio of divorced to married women for the Malays declined for all age groups from 1947 to 1970 (rf. Table 2.7) from levels of about 8-14 percent in 1947 to about 2-4 percent in 1970.* As this measure is influenced by the extent of remarriage, one needs to consider divorce rates derived from registration data. Table 2.8 indicates that divorce rates declined between 1950 and 1975. This

---

*Available evidence from the 1980 Census also indicates a decline compared with the 1947 figures.

decline was particularly sharp for the two East Coast states of Kelantan and Trengganu. For Kelantan and Trengganu, most of the decline took place between 1950 and 1960. Maznah (1975:53) found that the ratio of divorces to marriages of Malays in the Federal Territory, where divorce rates are very much lower than in the East Coast

Table 2.7

Proportion of Divorced to Married Women by Ethnic Group by Age

Ethnic Group/ Year	Age Group						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Malays							
1947	14.6	11.7	8.8	8.3	8.2	11.2	13.2
1957	7.6	6.3	5.2	5.6	6.6	9.1	12.3
1970	2.2	1.8	1.7	1.7	2.0	2.6	3.6
1980	n.a.	n.a.	<- 2.3 ->		<- 3.2 ->		5.0**
Chinese							
1947	1.2	0.7	0.5	0.4	0.6	0.8	1.0
1957	1.0	0.5	0.6	0.5	0.6	0.6	0.7
1970	0.9	0.4	0.5	0.7	0.9	1.1	1.4
1980	n.a.	n.a.	<- 0.4 ->		<- 0.9 ->		1.5**
Indians							
1947*	1.4	1.1	0.7	0.6	0.8	1.2	1.6
1957	1.3	1.4	1.1	1.0	1.0	1.5	1.6
1970	0.7	0.8	1.0	1.2	1.4	1.5	1.9
1980	n.a.	n.a.	<- 1.0 ->		<- 1.7 ->		2.4**

*These figures are not exactly comparable with later years because these figures are for Pakistanis and Indians while the later figures are for Indians only.

n.a. not available

**45-54 years of age

Source:Censuses

States, did not vary very much if one compares the 1969 with the 1973 figure, but that there was a declining trend from 1971 to 1973. She also reported that more than 80 percent of the divorces that occurred over this period in the Federal Territory were the normal type of divorce, that is divorce by talak, which is exercised by the husband

Table 2.8

Crude Divorce Rates, 1950 - 1975*

	1950	1955	1960	1965	1970	1975
Malay population	-	-	-	-	3.4	3.1@
Kelantan	26.3	17.0	12.8	9.0	6.9	6.5
Trengganu	18.1	17.8**	10.3	7.2	5.1	4.5
Kedah	12.8	9.9**	-	-	-	-
Selangor	5.0	4.2	-	-	1.8	1.7@
Malacca	5.7	4.6	3.6	1.4	1.1	0.5@
Johore	3.5	2.2	2.1	1.7	1.5	1.4

- not available
@ 1973
** 1953
*Compiled from various sources

Note: Divorces are net of rujuk (definition given in the text). The adult Malay population (aged 15+) was used as the denominator for these rates.

Source: Jones, 1981, Table 1

at his will and pronounced at home (rf. Sect. 1.4 for more details). The next most common type of divorce was the taalik or divorce by breach of condition by the husband, as stated in the surat taalik (attached to the marriage certificate) (rf. Sect. 1.4 for more details). These two types of divorce were also the most common between 1969 and 1973 in Malaysia, excluding the states of Perak,

Kedah and Sabah, for which no data were available (Maznah, 1975:90). Over this period, the states with the highest percentage of divorces to marriages in Malaysia, excluding Perak, Kedah and Sabah, were the East Coast States of Kelantan (54.9 percent), Trengganu (45.6 percent) and Pahang (35.5 percent) (Maznah, 1975:91). If one uses the figures provided in Abdul Halim (1979, Chap. 5) to calculate the ratio of divorces to marriages for Johore from 1969 to 1978, one finds that there is a definite trend of decline from 1973.

Kuchiba et al.(1979:162-66) reported that in the village of Galok, Kelantan, women instigated the divorce in most cases. The main reasons given for divorce were incompatibility of character, disagreement on postmarital residence, and discord with spouse's relatives. According to them, childlessness was not a reason for divorce nor do children deter the couple from separating. Their study also showed that divorce was lower if both husband and wife were from the same village of Galok.

Maznah (1975:72-73) gave the following reasons as being the main causes for Malay divorce, in order of importance, in the Federal Territory between 1969 to 1973:[3] (1) lack of maintenance, usually by the husband, (2) bad husband-wife relationship, especially bad treatment by the husband, (3) polygamy, (4) interference from parents or outsiders, more by parents, (5) difference in ages between the spouses, or one or both of the spouses being very young, (6) infertility and sickness, usually in the form of judicial divorce through fasah, mostly by wives, and only by order of the kathi. (1), (2) and (5) were given as the main causes for divorce in all states of Malaysia, excluding Perak, Kedah and Sabah, as stated in Maznah

(1975:92), based on a paper presented by the Pusat Islam at the Seminar of kathi Malaysia on 10-11 July 1975 at the Masjid Negara.

The next question then relates to how fast Malay marriages terminate in divorce. Kuchiba et al. (1979:163) reported that most of the divorces in Galok, Kelantan, took place soon after marriage; 50 percent of the men and 40 percent of the women divorced within one year of marriage while 85 percent of the men and 79 percent of the women divorced within about five years of marriage. On the other hand, they found that very few marriages that had lasted for ten years or more ended in divorce. The proportion of marriages terminating in divorce for Malaysia as a whole is not as high as in the East Coast States such as Kelantan. From Table 2.9, it can be seen that a higher proportion of Malay first marriages was dissolved compared with Chinese first marriages. About 7 percent of Malay first marriages ended in divorce within one year of marriage and about 16 percent within 5 years. Higher order marriages tend to end in divorce faster than first marriages; about 28 percent of second and third order marriages of Malay women ended in divorce within 5 years of marriage.

For the first marriages, additional control by years since first marriage indicate that generally there is a declining trend from older to younger cohorts in the proportion of marriages ending in divorce for the Malays (rf. Table 2.10). For example, about 26 percent of Malay women married 30 or more years before the survey divorced/ separated within 5 years of their first marriage compared with 9 percent in the women married 5-9 years before the survey. More detailed analysis will be carried out in Chapter 5.

For the Chinese and Indians, the ratios of divorced women to married women (rf. Table 2.7) were relatively small compared with the values for the Malays in the 1947 - 1970 period. However, if one looks at the figures for the age groups 30 years and above, there

Table 2.9

Cumulative Percent of Marriage Terminating in Divorce or Death of Husband Within a Given Duration of Marriage by Marriage Order by Race, Using Life Table Technique, 1974 MFFS

Method of Dissolution/ Marriage Order/ Race	Duration (in months) from Marriage to Dissolution 6	12	18	24	36	48	60	N
Divorce								
First Marriage								
Malays	3.2	6.8	9.0	10.5	13.6	15.3	16.2	3585
Chinese	0.1	0.2	0.3	0.5	0.6	0.9	0.9	2107
Second Marriage								
Malays	6.2	13.0	16.5	18.6	23.0	24.7	28.1	730
Chinese	*	*	*	*	*	*	*	39
Third Marriage								
Malays	6.0	9.5	13.0	14.8	19.0	24.8	28.3	236
Chinese	*	*	*	*	*	*	*	0
Death of Husband								
First Marriage								
Malays	0.3	0.4	0.6	1.0	1.5	2.2	3.0	3585
Chinese	0.0	0.0	0.0	0.1	0.3	0.4	0.5	2107
Second Marriage								
Malays	0.1	0.9	1.6	2.4	3.2	3.8	4.0	730
Chinese	*	*	*	*	*	*	*	39
Third Marriage								
Malays	0.9	0.9	1.9	2.4	2.9	4.1	4.8	236
Chinese	*	*	*	*	*	*	*	0

*Values not shown because less than 100 cases.

seems to be an increase in the frequency of divorced to married women for the Chinese and Indians over this period. The increase, however, need not necessarily reflect a decline in the durability of marriage of these two races, as this measure is influenced by the extent of remarriage. The limited registration data available indicate that the

Table 2.10

Cumulative Percent of Marriage Terminating in Divorce or Death of Husband Within a Given Duration of Marriage by Marriage Cohorts for Ever-married Malay Women, Using the Life Table Technique, 1974 MFFS

Method of Dissolution/ Marriage Cohorts	Duration (in months) from Marriage to Dissolution							
	6	12	18	24	36	48	60	N
Divorce								
1965-69	1.6	3.3	4.2	4.9	7.3	8.5	9.4	427
1960-64	2.8	4.5	6.3	7.3	10.0	13.1	14.1	401
1955-59	3.2	6.4	9.0	10.6	13.5	14.6	15.9	536
1950-54	4.3	7.8	9.3	10.0	12.8	14.6	15.3	400
1945-49	4.7	11.4	14.9	17.1	20.4	21.3	23.0	317
Before 1945	4.1	12.4	15.5	18.3	23.7	26.2	26.4	436
Death of Husband								
1965-69	0.0	0.0	0.5	0.7	0.7	1.2	1.2	427
1960-64	0.3	0.5	0.5	0.5	0.8	1.9	2.2	401
1955-59	0.0	0.0	0.0	0.6	1.1	1.1	1.8	536
1950-54	0.0	0.3	0.3	0.3	1.4	2.3	2.3	400
1945-49	0.0	0.7	1.1	2.2	3.0	3.0	4.2	317
Before 1945	0.2	1.0	1.5	2.6	3.5	5.6	7.2	436

divorce rate for non-Malays was very low, around 0.02 per thousand population, and it has changed little over time (U. N. Demographic Yearbook, various issues). The 1974 MFFS data also indicate a relatively small proportion of Chinese marriages ending in divorce

(rf. Table 2.6). The proportion of Chinese first marriages ending in divorce/separation up to 5 years after marriage remained at below 1 percent. Additional control by years since first marriage (results not shown) indicates no definite trend and the proportion of first marriages ending in divorce up to 5 years after marriage remained below the one percent level, except for women married around the time of the Second World War (where about 2 percent of the women were separated/divorced at the end of 5 years after first marriage).

Table 2.11

Proportion (%) of Widowed to Married Women by Ethnic Group by Age

Ethnic Group/ Year	Age Group 15-19	20-24	25-29	30-34	35-39	40-44	45-49
Malays							
1947	2.0	2.9	4.2	7.3	12.4	24.2	38.2
1957	0.7	1.2	2.3	4.6	9.0	15.7	34.7
1970	3.7	3.4	3.9	5.1	7.7	13.7	22.1**
1980	n.a.	n.a.	<- 1.9 ->		<- 5.6 ->		17.0**
Chinese							
1947	1.7	2.5	3.9	6.6	10.8	19.8	31.6
1957	0.5	0.5	1.5	3.6	7.2	14.6	26.8
1970	2.4	0.7	1.0	2.0	4.1	9.4	17.4**
1980	n.a.	n.a.	<- 1.0 ->		<- 3.8 ->		13.7**
Indians							
1947*	1.8	3.7	6.6	12.5	23.5	44.1	72.6
1957	0.6	1.1	2.2	4.9	10.7	23.6	46.9
1970	1.5	1.4	2.1	3.8	7.0	13.6	23.7**
1980	n.a.	n.a.	<- 2.3 ->		<- 8.9 ->		22.7**

* same as Table 2.7
**45-54 years of age
Source: Censuses

WIDOWHOOD

The decline in age difference between spouses (rf. Table 2.5) and the decline in mortality (rf. Table 3.12, Chander et al., 1977) have substantially reduced the age-specific risks of marital disruption due to widowhood. Over the 1947 - 1970 period, the decline of widowed to married women was particularly large for women aged 30 years and above (rf. Table 2.11).* It is interesting to note that over this period, the ratio of widowed to married women among the Chinese, particularly those of age 30 years and above, was lower than among the Malays or the Indians, no doubt related to lower Chinese mortality rates (rf. McDonald, forthcoming, Table 5) and lower age difference of Chinese couples (rf. Tables 2.12 and 2.13), as the remarriage rate is lower for the Chinese (rf. next section). Tables 2.6 and 2.9 also indicate that the percentage of Malay first marriages which were dissolved by husband's death was higher than that of the Chinese women in each category of duration since first marriage and marriage duration. For the Malay women, the proportion of first marriages terminated by death of husband within specified intervals after marriage generally indicates a decline over time (from older to younger cohorts) (rf. Table 2.10), thus substantiating earlier evidence.

---

*Available evidence from the 1980 Census indicate further decline over the 1970 figures.

Table 2.12

Mean Age Difference in years between Couples* by Race

Race	Age Difference	N
Malays	6.7	13535
Chinese	5.5	7462
Indians and others	7.5	2645

*include only households where the man was the head of household

Source: Two Percent 1970 Census Data

Table 2.13

Mean Age Difference in years between Couples by Race by Years Since First Marriage

Race/ Years since First Marriage	Age Difference	N
Malays		
<5	5.7	674
5 - 9	6.4	538
10 - 14	6.4	511
15+	7.6	1858
Chinese		
<5	4.4	466
5 - 9	4.7	449
10 - 14	4.1	346
15+	6.6	845
Indians		
<5	5.2	100
5 - 9	6.7	106
10 - 14	7.8	92
15+	8.9	291

< less than

Source: 1974 MFFS

2.1.3. REMARRIAGE

The next question relates to the extent of remarriage given the above pattern of marital dissolution. According to the 1966-67 MFS, about 17 percent of women aged 15-45 had married more than once; 13 percent had married twice and the rest three or more times (1966-67 MFS Report, Table A11). The 1970 Census (rf. Table 2.14) reported that about 13.5 percent of all married women aged 10 years and over had married more than once; 8.5 percent had married twice and about 5 percent had married three or more times. For all married men aged 10 years and over, about 10 percent had married twice and 6.5 percent had married three times or more.* The 1974 MFFS also reported that about

Table 2.14

Percentage of Married Population Aged 10 Years And Over by Number of Times Married by Race and Sex in 1970

Number of Times Married	Malays		Chinese		Indians		Total*	
	M	F	M	F	M	F	M	F
1	73.1	77.2	96.7	98.8	92.8	97.0	83.3	86.4
2	15.5	13.8	3.0	1.2	6.2	2.9	10.2	8.5
3 or more	11.4	9.0	0.3	0.0	1.0	0.1	6.5	5.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*includes 'other races'
M = Male
F = Female
Source:Calculated from 1970 Census Report, 2:360

---

*Note that all figures for men also include polygamous marriages.

13 percent of the women had married more than once, 9 percent of whom married twice and the rest three times or more (Chander et al., 1977:64). As this measure is heavily influenced by age structure one restricts the observations to men and women aged 45 to 49 years. When this is done (rf. Table 2.15 and Table 2.16), it is clearly seen that the ethnic differences are very wide indeed: more than 30 percent of Malay men and women married more than once compared with only 2-4 percent of Chinese women and men.* The prevalence of remarriages is also clearly indicated by the fact that in Table 2.17, only a fairly small proportion were currently widowed or divorced, indicating that most had remarried. The table also shows that a higher proportion of the divorced/separated women have remarried compared with widowed women. Chander et al. (1977:67) suggested that this may be due to the fact that widowhood occurs at a later age and women may divorce because of a desire to remarry.

Table 2.15

Percentage Distribution of Married Women Aged 45-49 Years by Number of Times Married by Race - 1974 MFFS

Race	Number of Times Married				N
	1	2	3	4+	
Malays	60.7	23.6	9.9	5.7	415
Chinese	96.2	3.8	-	-	262
Indians	86.4	11.9	1.7	-	59

- no case

*This is explained by the fact that quick remarriage of divorcees (after the mandatory Islamic 100-day period of edah) is the norm for Malay women while Malay men separated by divorce or death can remarry at any time.

Table 2.16

Percentage Distribution of Married Men and Women Aged 45-49 Years by Number of Times Married by Race

Race/ Sex	Number of Times Married				N
	1	2	3	4+	
Malay					
Male	62.2	20.4	9.1	8.3	1786
Female	65.7	19.9	7.2	7.2	1835
Chinese					
Male	96.5	3.2	0.2	-	810
Female	98.4	1.5	0.1	-	954
Indian and others					
Male	90.7	8.0	0.6	0.6	463
Female	91.6	8.1	0.3	-	310

- no case

Source: Two Percent 1970 Census Data

Table 2.17

Percentage Distribution of Ever-married Women (15-49 years) by Status of First Marriage and by Marital Status at the Time of Interview, 1974 MFFS

	Currently Married	Widowed	Divorced/ Separated
Current Status of First Marriage	81.3	6.3	12.4
Marital Status at the time of interview	91.9	4.5	3.6

Source: Chander et al., 1977:66

Table 2.18 indicates that the older the age at second marriage, the lower the probability that a Malay women will remarry within three

Table 2.18

Cumulative Percent of Ever-married Malay Women* Remarrying After Divorce and Widowhood by Interval (in months) Since Termination of First Marriage, Using Life Table Technique, 1974 MFFS

Interval	Percentage of Women Remarrying Within 6	12	18	24	36	Total No. of Divorces
Divorce to Second Marriage						
Age at Second Marriage						
< 21	22.2	47.7	63.6	75.5	82.7	362
21 - 24	9.8	21.6	35.8	45.9	61.3	125
25+	7.6	18.0	26.3	31.6	41.7	176
Widowhood to Second Marriage						
Age at Second Marriage						
< 21	2.8	6.2	8.7	13.3	20.7	362
21 - 24	2.5	7.3	10.7	13.4	23.4	125
25+	4.7	9.3	11.5	13.9	26.3	176

*The sample size of Chinese women is too small for the tabulation to be meaningful.

< less than

years of divorce from the first marriage. In other words, the younger the age at which a woman divorces, the higher the tendency that she will remarry within the specified periods. For example, 22 percent of the women who remarried at the age of 20 years or below remarried within 6 months of divorce, compared with 8-10 percent of women who

remarried at older ages. In contrast, women who were widowed (and thus remarried) at younger ages tend generally to take a longer time to marry. Perhaps older widowed women felt that they had to remarry more quickly or they might not have the opportunity to do so at a later date.

2.1.4. POLYGYNY

The practice of polygyny appears to have declined* in recent years as a result of higher education of women, increasing urbanisation and increasing awareness among women of their rights. Under the Law Reform (Marriage and Divorce) Act, 1976, polygamy for non-Muslims was abolished. There has been no similar proposal for Muslims but recently there have been suggestions that a Muslim be allowed to marry a second wife only with the consent of the kathi or the Syariah Court. As in other Muslim countries, except for the Tunisian Law of 1956 which prohibits polygamy outright, the tendency is towards stricter implementation of regulations governing such marriages rather than direct legislation on multiple marriages. For example, in the Federal Territory, a man intending to marry a second wife must first apply to the kathi and the kathi gives permission based on the reasons, supported with evidence, given by the man. His first wife is not consulted in any way (Maznah, 1975:35).

---

*The 1957 and 1970 Censuses both indicate that there were 5 percent more currently married Malay females than males. In 1957 there were 6 percent more currently married Chinese females than males but this fell to 0.1 percent in 1970. The figures may mean that the incidence of polygamy had not changed for the Malays but had reduced for the Chinese. These figures, however, may be influenced by interethnic marriages and by misstatement of marital status.

Abdul Halim (1979, Chap. 5) looked at 56 cases of applications by Malays to take second wives in Johore in 1978. He found that about 41 percent were from men of ages 23 to 33 years and 36 percent of ages 34 to 43 years. More than 53 percent of these men earned less than M$500 per month. About 78 percent of the women they wanted to marry were from the age range 16 to 34 years. Of the 46 cases of such women who stated their marital status, about 63 percent had never married before.

* * * * * * * * * * * *

Thus, the trend is towards a later age at marriage, declining divorce and less practice of polygyny. However, the Malays, compared with the Chinese, continue to marry earlier, marry more times and tend to remarry within a shorter period.[4] The next section looks at the changes that have occurred in terms of marriage behaviour and attitudes.

2.2. CHANGES IN MARRIAGE BEHAVIOUR AND ATTITUDES

In this section, an attempt is made to present a general picture of the marriage behaviour and attitudes of the Malays and Chinese. As information on attitudes and behaviour gathered from surveys can only be suggestive of the attitudes and behaviour of certain groups of people at particular points in time, the information is used only to give a general picture.

2.2.1. CHOICE OF A MATE

With increasing urbanisation and education there is increasing freedom in the choice of marriage partners (rf. Rindfuss and Morgan, 1983:269-270). The choice of mates is, however, limited by controls imposed by each culture. These controls include incest avoidance and preferences for mates of the reference group concerned. Mate preferences may mean the conscious choice of a mate because of certain characteristics. The choice of a mate may be completely free without intervention from a third party, that is self arranged, or arranged marriages. Yeh (1969) in a study of the Singapore Chinese reported that arranged marriages exist and the degree of freedom in self-arranged marriages differs from person to person with more liberty for men than women. In Singapore, the actual practice follows two patterns of limited freedom of choice of mates (1) parents choose mates with the children's approval, and (2) children select their own marital partners with their parents' consent (Yeh, 1969:82). In two small-scale studies on Chinese wives, one found that a higher proportion of the respondents chose their mates with parental approval while the other found that a higher proportion of the marriages were arranged by the parents with the individual's consent (see Appendix 2.1). Both studies however agreed that the proportion of women marrying without parental approval was negligible. In See (1979) it was also found that the majority of the women did not marry a relative, neither did they favour marriage to a relative.

Turning now to Malays, Strange (1976) reported in her study of a village in Trengganu in 1965-66 that individuals with coeducational post secondary education and those who were economically independent

were able to choose their own mates. Those who did not make their own selections had the power to accept or reject any proposed mate. According to Abdul Halim (1979, Chap. 3), for the Malays in Kampung Pasir, Johor Baru, whether one was free to choose a mate depended on the age at marriage and the level of education.* Those who married at very young ages and those who had little or no education tended more to rely on their parents' choice. In this study and two other studies about 40-55 percent of the respondents chose their own partners with parental approval while a negligible proportion chose their own mates without parental approval (rf. Appendix 2.1). The rest were marriages arranged by their parents with the individual's consent. The majority of the respondents interviewed in Abdul Halim's study had the opinion that they should not marry relatives, although as stated in Sect. 1.4.2, marriage between cross cousins of the first and second degree is preferred. In fact only about 17 percent of the respondents in this study and 35 percent of the respondents in Mustafar (1980) married a relative. Kuchiba et al.(1979:157) also reported that in the village of Galok in Kelantan the Malay parents consult their daughter about her prospective husband.

Thus, it appears that the trend is for the young people to choose their partners and then ask for parental approval. For those whose marriages were arranged for them by their parents, they were consulted on the choice. It seems that the practice of limited freedom of choice of mates, as stated by Yeh (1969) for Singapore, is practised by the Malays and Chinese in Peninsular Malaysia.

---

*The evidence in Mustafar (1980) also indicates that the higher the level of education the less the reliance on parents to choose their mates.

2.2.2. MARRIAGE ARRANGEMENT*

For a Malay the first step in arranging a marriage takes the form of indirect questioning. If successful, some female relatives of the man will then go and formally ask for the girl. If the negotiations are satisfactory a formal engagement then follows with the exchange of gifts and the date of the wedding ceremony is fixed. In the meantime, if an engagement is broken, compensation is paid depending on who breaks the engagement. The amount of compensation varies according to the adat or custom that is followed.

The marriage itself consists of a marriage agreement between the groom and the guardian (wali)** of the bride made in the presence of two witnesses, who should satisfy themselves of the bride's willingness. At this point, the marriage payment (mas-kahwin or mahr) is made or, if it is to be owed, is formally stated. This payment is rarely a large sum, except in the East Coast States,@ and becomes the property of the bride.

---

*These arrangements are discussed in many texts. The form of marriage arrangement discussed here is a modified one and even then not all couples go through all the ceremonies.

**Her father or his representative, but if he is dead the nearest patrilineal relative. If a woman has no wali or her wali has unreasonably refused consent, a wali raja may be appointed to solemnise the marriage. The wali raja may be in the person of the kathi besar, the kathi or Registrar and in this case, the woman's consent is essential.

@Maznah (1975:14) reported that the amount of the mas-kahwin in the Federal Territory, Selangor and Johore, is fixed at the token sum of M$22.50.

In addition to the marriage payment the groom has to pay 'marriage expenses' to the father of the bride for the cost of the wedding celebrations, usually held in the girl's house. This may be a large sum, depending on the wealth and standing of the parties. Swift (1963) reported that in certain areas, this payment was dispensed with or as in parts of Johore, was used to provide household essentials for the newly-married couple.

Once the marriage agreement is completed, the marriage is registered. Although, according to Muslim and Administrative Law, registration of the marriage recognises the couple as husband and wife, further customary ceremonies are required by the people if it is the girl's first marriage. These customary ceremonies vary but are usually expensive. An important part of these ceremonies is the bersanding ceremony, where the young couple are placed on an elaborate dais for all visitors to see.

Abdul Halim (1979, Chap. 5) found that about 90 percent of his 100 Malay respondents went through all the stages of ceremonies, from engagement to the bersanding ceremony.

For a Chinese, the search for a candidate, if needed, and the initial negotiations are carried out by the matchmaker or the go-between. At the first stage of negotiations, bride price, dowry and even some details of the wedding ceremony are agreed upon. At this stage too, horoscopes are matched, especially if the marriage is arranged.

The girl is allowed to meet the man at an early stage of the arrangement process, either in the form of superficial formal 'seeing sessions' under close supervision by third parties or on their own or some combination of the first two forms. If the couple favour each other after the first one or two meetings, then gifts are exchanged, there are mutual family visits and the engagement is formalised. At this point, the girl will receive an engagement ring and there is usually a tea party. The boy's family also supplies sweetmeats to the girl's family for distribution to their friends and relatives. This is the traditional way of public announcement. Some more modern families may even put an announcement in the newspapers. Kaur (1979:3), in her survey in Klang, found that only 37 of her respondents went through an engagement. On the other hand, See (1979:41) reported that 80 percent of her 107 Chinese wives in Segamat, Johore, underwent an engagement ceremony.

Between the time of the engagement and the wedding, 'bride price' or 'betrothal gold' together with other gift items are sent from the groom's family to the bride's. The 'bride price' varies in amount, depending on the economic position of the families. After the engagement, the couple is allowed more freedom since it is felt that such engagements are binding. Broken engagements are regarded as embarrassing and a loss of 'face' but there are probably more broken engagements now than before. The wedding takes a number of forms, it can either be a church wedding, a civil ceremony or registry marriage, a traditional 'tea ceremony' marriage or even a mass wedding. Many Chinese couples feel that customary rites are important and so they go through double ceremonies. The traditional 'tea ceremony' marriage essentially consists of a ceremony in which the couple pay reverence

to the groom's family and make obeisance before the family altar of his ancestors, and finally the bride serves tea to the groom's parents and other relatives senior to her husband. As each of these persons receives her respectful offer of tea, they each offer her a red packet of a gift as a form of welcome. The gift may range from a few dollars to very expensive pieces of jewellery, depending on the wealth of the family. Kaur (1979:41), in her survey in Klang, found that 61 of her respondents went through a registry marriage, 30 through a church wedding and 9 through a traditional ceremony. Sixty five of the 91 women who went through registry or church marriages also underwent some form of customary marriage rituals. Of the 100 women, 25 of them had their horoscope matched for choice of partner, date of engagement and marriage. Forty seven of them also had the tea-ceremony while the rest did not. See (1979:33) reported that 75 percent of her sample in Segamat, Johore, practised horoscope matching and 66 percent of those who matched horoscopes underwent arranged marriages. Eighty six percent of the wives also underwent customary marriages but only 56 percent of them had a tea-ceremony (See, 1979:37,46). More than 96 percent of the respondents received their bride price but the amount varied depending on the amount the husband could afford.

2.2.3. ATTITUDES TOWARD MARRIAGE

The attitude survey by Yeh (1969, Chap. VI) of Chinese college students and manual workers in Singapore showed that the college students placed a greater emphasis on love as a criterion of marital choice but were more liberal as regards family status and traditional standards such as surname exogamy. Women placed greater emphasis on

rank and family status while men looked for physical appearance in their mates. Most of the sample thought that they were free to choose their marriage partners. Kaur (1979:38) found that 62 of the 100 Chinese wives in Klang considered love as being absolutely necessary for a marriage to be a success. See (1979:53) found that about 77 percent of her sample in Segamat considered personality as being the most important quality of the husband.

* * * * * * * * * * * *

Thus, it appears that most couples do not do away entirely with traditional arrangements of marriage. There seems to be a mixture of both traditional and more 'modern' forms of marriages. The next question relates to where couples lived immediately after marriage and whether they were willing to live with their parents.

2.2.4. LIVING ARRANGEMENTS

In the olden days, couples married very young and were usually not allowed to live on their own. Further, if a girl married before reaching the age of puberty she was not allowed to consummate marriage immediately and usually lived with her parents or in-laws (Swift, 1963:289). The couple were allowed to set up their own house only when they were older and more experienced and could afford to do so. From a question asked in the 1974 MFFS on children's willingness to live with parents after marriage (see Table 2.19), it was found that ever-married women considered that married children prefer not to live

with parents. This is the opinion of all age groups of women as well as all races. More than 83 percent of the total sample thought that married children prefer not to live with parents and about 13 percent took the neutral position. If one looks at the distribution of ever married women by family type (rf. Table 2.20), one finds that only in the younger age groups of 15-24 years was there a greater proportion of women living in a non-nuclear type family compared with a nuclear type family.* If one subclassifies by race, one finds that a greater

Table 2.19

Percentage Distribution of Ever-married Women by Current Age and by Race by Opinion on Whether Children Are Willing to Live with Parents, 1974 MFFS

	Willingness of Children to live with Parents			
	prefer with parents	no preference	prefer not with parents	N
Current Age				
15-19	9.3	18.2	72.5	258
20-24	4.2	14.6	81.2	905
25-29	3.1	12.3	84.5	1145
30-34	3.8	12.9	83.3	1062
35-39	3.9	11.0	85.1	1059
40-44	2.9	10.2	86.9	826
45-49	2.9	14.9	82.2	700
Total 15-49	3.8	12.8	83.5	5955
Race				
Malays	3.1	10.2	86.7	3410
Chinese	3.5	17.3	79.2	1948
Indians	8.7	12.4	78.9	565

*A nuclear family is defined as a family consisting of a couple and their unmarried children.

Table 2.20

Percentage of Ever-married Women by Race by Current Age by Family Type, 1974 MFFS

Race/ Current Age	Nuclear	Non-nuclear	N
Total			
15-19	33.8	66.2	240
20-24	48.7	51.3	837
25-29	56.3	43.7	1119
30-34	65.5	34.5	1057
35-39	69.5	30.5	1082
40-44	69.3	30.7	851
45-49	61.2	38.8	727
Malays			
15-19	32.4	67.6	179
20-24	57.9	42.1	497
25-29	61.0	39.0	600
30-34	73.6	26.4	550
35-39	72.6	27.4	625
40-44	68.0	32.0	440
45-49	55.5	44.5	407
Chinese			
15-19	*	*	40
20-24	32.5	67.5	246
25-29	50.2	49.8	406
30-34	55.4	44.6	408
35-39	63.4	36.6	350
40-44	72.0	28.0	314
45-49	68.6	31.4	261

*less than 30 cases

proportion of Malays in the age group 15-19 were living in non-nuclear type family arrangement but the reverse is true for the other age groups. For the Chinese, a greater proportion lived in the nuclear type family arrangement if the age was 25 years or older. Data from

the 1966-67 MFS also show the same patterns for the Malay and Chinese women. This may indicate that initially after marriage the couples lived with the parents of one of them, because they were young or could not afford their own house, and moved out later when they were older and more independent and able to take care of themselves and could afford to do so. Evidence from the 1966-67 MFS indicates that for all racial groups, the proportions of women who stayed with either set of parents varies only slightly or not at all across birth cohorts or age at first marriage categories (results not shown). The above measure is however influenced by the survival of parents and the migration of the parents or their children.[5]

Yeh (1969:183) found that about 10-20 percent of Chinese couples in Singapore lived with the man's family; the majority lived on their own near the man's people. The attitude survey by Yeh (1969, Chap. VI) of college students and manual workers in Singapore showed that attitudes favoured the nuclear type family arrangement. Kaur (1979:48), in her survey in Klang, found that 74 of her respondents lived in a nuclear type family immediately after marriage but this figure declined to 52 at the time of the survey. The main reason given for the decline was that most of the respondents were working mothers and needed their mother or mother-in-law to take care of their children.

Abdul Halim (1979:80) reported that about 52 percent of the Malay couples in his study lived on their own immediately after marriage. About 40 percent did so after the first year of marriage. Mustafar (1980) found that only 6 percent of the 111 Malay respondents lived on their own after marriage. About 77 percent lived with the wife's parents and 11 percent with the man's parents. Thus, while the

general opinion favours not living with parents after marriage, in reality, most couples lived with either set of parents for at least a short time after marriage.[6]

Table 2.21

Percentage Distribution of Married Couples by Husband's Race and Wife's Race*

Husband's Race	Wife's Race				
	Malays	Chinese	Indians	Others	N
Malays	57.9	0.2	0.1	0.0	11952
Chinese	0.1	30.0	0.0	0.1	6223
Indians	0.2	0.2	10.3	0.0	2206
Others	0.0	0.1	0.0	0.8	187
N	11978	6250	2143	197	20568

*the sample consists of couples where either the husband or wife was the head of household. Only husbands with one wife and wives 15-49 years were included

Source: Two Percent 1970 Census Data

2.2.5. ETHNIC INTERMARRIAGE

The number of intermarriages is insignificant if one looks at the proportion of marriages where the husband and wife were not of the same race (rf. Table 2.21 and 2.22). From the 1974 MFFS data, one finds that only about 0.5 percent of the marriages were intermarriages. The 1970 Census (from the Two Percent Sample Tape)

showed that about 1.0 percent of the marriages of women between 15 and 49 years were intermarriages. As the number of cases of intermarriages in the 1974 MFFS was relatively few, the 1970 census data are used to indicate the prevalence of intermarriages between the ethnic groups. From Table 2.21, it can be estimated that intermarriages between Malays and Chinese and Malays and Indians each accounted for 29 percent of the intermarriages. Seventy six percent of the Malay-Indian intermarriages were between Malay women and Indian men. For the Chinese-Malay intermarriages, 54 percent were between Malay men and Chinese women. Intermarriages between Chinese and Indians accounted for only 19 percent of all intermarriages, of which 78 percent were between Indian men and Chinese women.

The 1970 census data are further analysed to see if the interethnically married are indeed different from others. From Table 2.23, it can be seen that those who intermarry as compared with the

Table 2.22

Percentage Distribution of Married Couples by Husband's Race and Wife's Race, 1974 MFFS

Husband's Race	Wife's Race: Malays	Chinese	Indians	Others	N
Malays	56.2	0.0	0.0	0.0	3440
Chinese	0.0	33.4	0.0	0.1	2056
Indians	0.1	0.1	9.3	0.0	583
Others	0.0	0.1	0.1	0.5	43
N	3451	2056	577	38	121

Table 2.23

Percentage Distribution of Couples* who Intermarry and Total Sample by Various Characteristics, Two Percent 1970 Census

Characteristics		Interethnic Marriages	Total Sample
1. Number of times married			
Husband	Wife		
Once	Once	77.8	79.1
Once	gt 1	6.7	8.8
gt 1	Once	7.1	2.8
gt 1	gt 1	8.4	9.3
2. Religion			
Same religion		70.3	98.4
Different religion		29.7	1.6
3. Age Difference (Husband - wife)			
less than -5		8.4	15.1
-4 to -1		8.4	10.9
0 to 4		25.5	28.9
5 to 9		28.5	27.6
10 or more		29.3	17.5
4. Current Residence			
Urban		63.9	61.4
Rural		36.1	37.2
5. State			
Johore		9.7	13.4
Kedah		10.2	12.3
Kelantan		3.2	9.4
Malacca		4.2	4.1
Negri Sembilan		4.6	4.8
Pahang		5.6	5.8
Penang		15.7	8.4
Perak		15.7	17.1
Perlis		1.9	1.6
Selangor		24.5	17.6
Trengganu		4.6	5.4
6. Education			
No schooling		13.4	26.2
1-6 years		50.5	60.4
7+ years		36.1	13.5
7. Occupation			
Professional, technical, managerial and administrative and related workers		15.7	5.2
Clerical, sales, service and related workers		35.6	18.2
Agricultural, animal husbandry, forestry workers, fishermen and hunters		14.4	43.0
Production and related workers, transport equipment operators and labourers		22.2	19.5
Not in labour force		9.3	11.5
Not stated		2.8	2.4

*The sample consists of all couples where either the husband or the wife was the head of the household.

gt greater than

total sample were more likely to be (i) those who marry across religious lines, (ii) those who were older than their wives by 10 years or more, (iii) those from the states of Penang and Selangor, (iv) those with more than 6 years of education, (v) those from professional, technical, managerial, clerical, sales and service and other related occupations. For all other characteristics, there seem to be no basic differences.

Freedman (1957) and Djamour (1959) reported that intermarriages between the Chinese and Malays were extremely rare in Singapore. However, Png (1969) reported that Chinese males and Malay females intermarried frequently in eighteenth- and nineteenth-century Malaya.[7] Kuo and Riaz (1979) in a study of ethnic intermarriage in Singapore, using marriage registration records, found the average intermarriage rate, that is, the number of intermarriages per hundred marriages, between 1966 and 1975 was about 4 per cent. They also found that the most frequent types of interethnic marriage occur between Malays and Indians, mostly of Muslim faith. Other findings of their study showed that those who intermarry, compared with all marriages in general, were more likely to be (1) those who have married before, (2) those who marry across religious lines and, (3) those from lower or upper occupational groups. The latter two were found to be true even when cases of remarriages were excluded. Kuo and Riaz, however, found that the age at first marriage of the brides and grooms and the age difference between husband and wife for those who intermarry do not, generally, differ from the overall pattern.

These findings seem generally consistent with our findings for Malaysia, using the 1970 Census data. However, for Malaysia, no evidence was found to indicate that those who intermarry tend to be those who have married before. Instead, one finds that for those who intermarry, the husbands tend to be older than their wives by 10 years or more and they tend to have at least 6 years of education.

Earlier, it was observed that age at marriage has been increasing since 1947. The next section looks at some trends in fertility with reference to nuptiality changes. Data from the 1966-67 MFS are not used as they are based on currently married women only and are not directly comparable with other data sets.

2.3. INTRODUCTION TO THE RELATIONSHIP BETWEEN NUPTIALITY AND FERTILITY

Table 2.24 presents the mean cumulative fertility by age groups and by ethnic community. If one reads down columns of the 1947-1970 Census figures, one finds that reported mean cumulative fertility increases with age up to about 44 years of age and declines thereafter. As fertility is more or less completed after age 40

Table 2.24

Mean Cumulative Fertility of Ever-married Women by Age and Ethnic Community

Age Groups	1947* Census	1957 Census	1970 Census	1974 MFFS	1980 Census
Total					
15-19	0.64	0.86	0.87	0.80	0.8
20-24	1.52	2.06	1.92	1.70	1.5
25-29	2.57	3.41	3.25	2.80	2.4
30-34	3.46	4.42	4.60	4.20	3.6
35-39	4.06	5.03	5.67	5.50	4.7
40-44	4.22	5.18	6.10	6.10	5.5
45-49	4.21	4.99	5.73	6.20	5.9
50-54	3.96	4.70	5.47	n.a.	n.a.
Malays					
15-19	0.68	0.86	0.82	0.79	0.8
20-24	1.59	2.15	1.92	1.67	1.5
25-29	2.66	3.51	3.44	3.00	2.5
30-34	3.58	4.40	4.81	4.47	3.8
35-39	4.26	4.98	5.79	5.68	5.1
40-44	4.48	5.10	6.11	6.19	5.9
45-49	4.64	5.03	5.53	5.90**	6.0
50-54	4.44	4.88	5.35	5.49	n.a.
Chinese					
15-19	0.52	0.66	1.04	0.90	0.9
20-24	1.37	1.69	1.76	1.56	1.4
25-29	2.41	3.18	2.83	2.44	2.1
30-34	3.32	4.48	4.12	3.89	3.1
35-39	3.86	5.20	5.41	5.00	4.1
40-44	3.96	5.41	6.10	5.85	4.9
45-49	3.77	5.05	6.08	6.74**	5.6
50-54	3.36	4.53	5.81	7.51	n.a.
Indians					
15-19	0.58	1.02	1.11	1.09	0.9
20-24	1.57	2.41	1.29	1.96	1.7
25-29	2.60	3.78	3.76	3.29	2.7
30-34	3.37	4.68	5.25	4.66	3.8
35-39	3.88	5.04	5.97	6.06	4.8
40-44	4.01	4.94	6.14	6.89	5.7
45-49	4.04	4.74	5.94	6.37**	6.1
50-54	3.87	4.54	5.07	7.58	n.a.

*women with number of children ever born not reported in 1947 are assigned to the zero parity category (see 1947 Census Report:65-67)

**50 years only

Source: Censuses
Chander et al., 1977:75
1974 MFFS

years, this would suggest that there was an increase in completed cohort fertility from early in the 20th century until the 1950s or there was under-reporting of children born alive to older women. It is possible that there was an element of both. If one reads across rows, one finds that, except for those below age 30 years, average fertility by age groups seems to have increased over time between 1947 and 1970. Hirschman and Fernandez (1980:119) have suggested that this increase in average fertility was due to 'the making up of births postponed during World War II or in the immediate postwar years and perhaps some earlier than usual family formation in the affluent years of the Korean War rubber boom'. Smith (1952:39) also noted the increase in fertility. A number of reasons have been suggested for this increase. Improved nutrition or other institutional changes may have led to increased fecundity. The increased fertility of Chinese women may have resulted because in the 1920s or 1930s many of the Chinese women were separated from their husbands. It is also possible that part of this increase may have resulted from an improvement in the completeness of coverage of the census. Under-reporting of the number of children ever born may have resulted because of memory lapse or because women only reported children who were currently living or these figures represent the mean fertility of survivors in those birth cohorts, particularly if mortality was selective of women with a large number of children (Hirschman and Fernandez, 1980:117-119). The figures from the 1974 MFFS also indicate a similar increasing trend in average fertility by age. The average fertility of women in the age groups 35 years and above was mostly higher in 1974 than in 1957 but these figures were not very different from figures of comparable groups in 1970. The 1980 Census figures, however, indicate relatively

fewer children ever born for practically all age groups than was the case in 1970. These trends seem also to hold true by racial groups. If Chinese completed fertility is compared with Malay completed fertility, one finds that the Chinese fertility was higher than the Malay fertility in the 1957-1974 period. The lower Malay fertility may be explained in terms of under-reporting of Malay births (compared with Chinese births), or lower level of nutrition and therefore lower fecundity and lower fertility. Lower fertility may also have resulted because Malay women had higher marital disruption rates, due both to higher rates of divorce and mortality. Furthermore, traditional fertility behaviour relating to breastfeeding and abstinence may have reduced Malay fertility.

Among young women below 30 years, the trend of average fertility seems to be declining after 1957; this is true even if one looks at sub-categories by races, except for one or two odd categories. The fall in the average fertility in these groups was possibly the result of a number of factors, such as delayed age at marriage, increased education of women, increased labour force participation and perhaps changes in family size norms. The postponement of births by these cohorts of women would have caused a temporary decline in period fertility. Also, Malay fertility in these age groups was higher than Chinese fertility. The interesting question is whether the lowered fertility of these cohorts of women will mean a permanent reduction in family size and whether Chinese women will end up with smaller completed family size than Malay women. Certainly the decline in the average number of children ever born at all older ages suggests that

Table 2.25

Mean Number of Children Ever Born to all Ever-married Women by Age at First Marriage and Years Since First Marriage

Years Since First Marriage	Age at First Marriage					
	lt 15	15-17	18-19	20-21	22-24	gt 24
Total	5.5	4.9	4.3	3.4	2.9	2.3
	(954)	(1977)	(1244)	(849)	(823)	(467)
Under 5	1.0	1.1	1.2	1.1	1.0	0.9
	(32)	(263)	(268)	(244)	(282)	(158)
5 - 9	2.8	3.0	3.0	2.8	2.8	2.4
	(63)	(272)	(219)	(201)	(196)	(152)
10 - 14	3.9	4.3	4.4	4.0	3.8	3.3
	(90)	(288)	(198)	(145)	(147)	(87)
15 - 19	5.2	5.7	5.6	5.3	4.4	3.6
	(139)	(304)	(193)	(107)	(85)	(49)
over 19	6.3	6.6	6.6	6.1	5.4	4.9
	(630)	(850)	(366)	(152)	(113)	(21)

( ) actual number
lt less than
gt greater than
Source: Table 2.2.3A, Chander et al., 1977

the younger cohorts are unlikely to alter their present pattern and build up to the earlier levels of completed family size, and Chinese women will end up with smaller completed family size than the Malays. Evidence from the 1980 Census supports this, indicating a higher completed family size for the Malays than the Chinese.

2.3.1. FERTILITY AND AGE AT FIRST MARRIAGE

If one looks at the mean number of children ever born by age at marriage, the 1974 MFFS (rf. Table 2.25) indicates that there is a negative relationship between age at marriage and fertility. However, the relationship is not so clear-cut if one further sub-classifies according to duration since first marriage. If duration since first marriage is held constant, one finds that average fertility declines only when age at marriage was above 19 years. For women married for 20 years or more, those who married above 24 years had, on average, 4.9 births per woman compared with 6.6 births per woman for those married at ages 18 to 19 years.

Further cross-classification by racial groups* (rf. Table 2.26) showed that above the age at first marriage of 18 years, for all years since first marriage classifications, average fertility started to decline. A Malay woman married for more than 15 years who married at 17 to 18 years had, on average, 0.8 birth more than one who married at 21 to 22 years of age. Similarly, a Chinese woman married for more than 19 years who married at 17 to 18 years had, on the average, 1.1 births more than one who married at 21 to 22 years of age. Within all age at marriage categories for all durations since first marriage, the Chinese women had higher average fertility than the Malay women. This

---

*The Indians are not included because there are too few cases.

Table 2.26

Mean Number of Children Ever Born by Age at First Marriage by Years Since Marriage by Malay and Chinese Race**, 1974 MFFS

Race/Years Since Marriage	Age at First Marriage					
	lt 16	17-18	19-20	21-22	23+	Total
Malays						
less than 5	0.9	1.1	1.1	1.0	0.8	1.0
5 - 9	2.8 (2.9)	2.7	2.7	2.7	2.2 (2.3)	2.6 (2.7)
10 - 14	3.9 (4.0)	4.2	4.1	3.9 (4.1)	2.9 (3.0)	3.9 (4.0)
15+	5.9 (6.4)	6.2 (6.5)	5.9 (6.2)	5.1 (5.2)	4.6 (4.7)	5.9 (6.3)
Chinese						
less than 5	*	1.4	1.4	1.2	1.1	1.2
5 - 9	*	3.6	3.2	3.1	2.7	3.0
10 - 14	*	4.9	4.4 (4.5)	4.2	3.8	4.2 (4.3)
15+	7.2 (7.3)	7.1	6.4	6.0	4.7	6.4 (6.5)

*less than 30 cases

**Figures are for all ever-married women. Figures in brackets are for women married only once. Only those figures which differ from those of total ever-married women are presented.

lt less than

Table 2.27

Results Obtained from Applying the Components of Difference Approach to Malay and Chinese Mean Children Ever Born (CEB) of Women Married Only Once, 1974 MFFS

Years Since First Marriage	difference in mean CEB	amount due to composition	amount due to rates
10 - 14	0.26	-0.29	0.55
15+	0.16	-0.45	0.61

is also true if one looks at the figures just by duration since first marriage categories (last column, Table 2.26). For Malay women married only once, the mean number of children ever born was generally higher than for all Malay women, especially those married for 15 years or more. The figures for the Chinese women remained more or less the same even if one restricts the sample to women married once.

If the components of difference approach is applied to the mean number of children ever born of the once-married Malay and Chinese women in the 10-14 and 15+ years since first marriage categories, the results in Table 2.27 are obtained. They indicate that the difference in the mean number of children ever born between the Malays and Chinese would be larger if the composition by age at marriage of the two populations was controlled, that is the higher marital fertility of the Chinese is offset to some extent by earlier age at marriage of the Malays. The extent to which the earlier age at marriage of Malays offsets the higher marital fertility of the Chinese also increases as duration since first marriage increases.

Table 2.28

Mean Number of Children Ever Born by Age at First Marriage by Years Since Marriage by (1)childhood residence; (2)current residence; (3)religion; (4)education; (5)family income

Years Since First Marriage	Age at First Marriage						
	lt 15	15-16	17-18	19-20	21-22	23-24	25+
Childhood Residence							
Town							
0 - 4	*	*	1.1	1.1	1.1	0.9	0.9
5 - 9	*	*	2.7	2.8	2.8	2.4	2.4
10 - 14	*	*	4.3	3.8	3.6	3.6	3.3
15 - 19	*	*	5.9	5.0	4.7	*	3.2
20+	5.7	6.9	7.2	6.2	5.4	*	*
Village or estate							
0 - 4	*	0.9	1.2	1.2	1.1	1.1	0.9
5 - 9	*	2.9	3.0	2.9	2.9	3.0	2.4
10 - 14	3.8	4.0	4.5	4.5	4.3	3.8	3.5
15 - 19	4.9	5.3	6.0	5.7	5.4	*	*
20+	6.1	6.6	6.7	6.7	6.4	5.8	*
Current Residence							
Metropolitan or small town							
0 - 4	*	*	1.6	1.3	1.0	1.0	1.0
5 - 9	*	*	3.0	2.9	2.5	2.6	2.4
10 - 14	*	*	4.4	4.1	3.8	3.6	3.5
15 - 19	*	5.4	5.5	5.2	5.0	*	3.5
20+	5.9	7.0	7.0	6.1	5.4	5.1	*
Rural							
0 - 4	*	1.0	1.1	1.2	1.2	1.0	0.8
5 - 9	2.6	3.0	2.9	2.9	3.1	2.9	2.4
10 - 14	3.8	4.1	4.4	4.4	4.3	3.8	3.3
15 - 19	5.0	5.4	6.2	5.7	5.2	*	*
20+	6.1	6.5	6.7	6.8	6.5	6.1	*
Religion							
Muslim							
0 - 4	*	0.9	1.1	1.1	1.0	1.0	0.6
5 - 9	2.5	2.9	2.6	2.7	2.6	*	2.0
10 - 14	3.7	3.9	4.2	4.1	3.9	*	*
15 - 19	4.9	5.3	5.9	5.2	4.8	*	*
20+	6.0	6.3	6.4	6.3	5.6	*	*

(cont'd Table 2.28)

Non-Muslim							
0 - 4	*	*	1.3	1.4	1.2	1.0	1.0
5 - 9	*	3.9	3.5	3.1	3.1	2.8	2.5
10 - 14	*	4.9	4.8	4.5	4.2	3.9	3.6
15 - 19	*	*	6.0	5.7	5.4	4.6	3.9
20+	6.8	7.5	7.3	6.7	6.2	5.8	*
Education of Wife							
No education							
0 - 4	*	*	*	*	*	*	*
5 - 9	*	*	*	3.0	3.1	*	2.3
10 - 14	*	3.9	4.5	4.1	4.3	*	3.3
15 - 19	4.7	5.6	5.8	5.4	5.2	*	*
20+	5.9	6.5	7.0	6.8	6.6	5.6	*
With education							
0 - 4	*	1.0	1.1	1.2	1.1	1.0	0.8
5 - 9	*	2.9	3.0	2.9	2.8	2.7	2.4
10 - 14	3.6	4.2	4.4	4.4	4.0	3.7	3.4
15 - 19	5.3	5.3	6.1	5.6	5.1	4.1	2.9
20+	6.6	6.9	6.6	6.1	5.4	5.5	4.1
Family Income per Month (Malaysian dollars)							
less than $200							
0 - 4	*	1.0	1.1	1.0	1.3	0.9	1.0
5 - 9	*	3.1	2.8	2.9	2.7	2.9	2.4
10 - 14	3.8	4.0	4.3	4.1	4.0	*	3.2
15 - 19	4.9	5.4	5.5	5.4	4.7	*	*
20+	5.8	6.2	6.2	6.1	5.7	*	*
$201-$500							
0 - 4	*	*	1.3	1.3	1.1	1.1	1.0
5 - 9	*	3.2	3.3	3.0	3.1	2.9	2.4
10 - 14	*	4.4	4.4	4.6	4.3	4.1	3.8
15 - 19	5.4	5.6	6.2	5.9	5.4	*	*
20+	6.8	7.1	7.3	7.0	7.0	*	*
$501+							
0 - 4	*	*	1.3	1.3	0.9	0.9	0.7
5 - 9	*	*	*	*	2.8	2.5	2.4
10 - 14	*	*	*	*	3.8	*	*
15 - 19	*	*	6.6	*	*	*	*
20+	5.9	7.1	7.7	6.3	5.0	*	*

*less than 30 cases
lt less than
Source: 1974 MFFS

However, as age at first marriage is highly correlated with other factors such as education, income and residence, each of these factors is used as a control. The control of each of these variables (see Table 2.28) separately does not seem to affect the negative relationship between average fertility and age at marriage above 18 years. At a later stage, further analyses will be carried out to see what effect age at marriage has on fertility if some of these relevant variables are controlled simultaneously.

Table 2.29

Mean Number of Children Desired by Age at First Marriage by Years Since Marriage by Malay and Chinese Race, 1974 MFFS

Race/Years Since First Marriage	Age at First Marriage				
	lt 17	17-18	19-20	21-22	23+
Total					
less than 5	4.0	4.0	4.3	3.8	3.7
5 - 9	4.3	4.4	4.7	4.2	3.7
10 - 14	4.9	4.6	5.2	4.3	4.0
15+	6.4	6.4	4.5	4.9	4.1
Malays					
less than 5	4.0	4.1	4.8	4.0	4.7
5 - 9	4.4	4.6	5.4	4.5	3.9
10 - 14	5.2	4.9	6.4	4.7	4.2
15+	6.7	8.2	5.0	4.6	4.6
Chinese					
less than 5	*	3.9	3.9	3.8	3.3
5 - 9	*	4.3	4.2	4.2	3.7
10 - 14	*	4.2	4.5	4.1	3.9
15+	5.2	4.4	4.3	4.4	4.0

lt less than
*less than 30 cases
Note: Indians are not included as a separate category because there are too few cases

When one looks at the final number of children desired by women, one sees that, generally, the average fertility is lower when age at marriage was above 20 years (rf. Table 2.29). The only categories which appear different are Chinese wives married for 5 to 9 years and those married for 15 years or more.

Table 2.30

Mean Number of Children Ever Born by Years Since First Marriage for all Ever-married Women and Malays by the Number of Times Married, 1974 MFFS

Years since first Marriage	Number of Times Married	
	Once	2 or more
Total		
less than 5	1.1	*
5 - 9	2.8	2.3
10 - 14	4.1	3.4
15 - 19	5.5	4.2
20+	6.8	5.3
Malays		
less than 5	1.0	*
5 - 9	2.7	2.3
10 - 14	4.0	3.4
15 - 19	5.5	4.2
20+	6.7	5.2

Note: The other races are not presented as separate categories because the number of cases married more than once was too few

*less than 30 cases

2.3.2. STABILITY OF MARRIAGE AND FERTILITY

Evidence from the 1974 MFFS (rf. Table 2.30) seems to indicate that the average fertility was lower for those who married more than once. For those women who married for the first time 20 years ago or more, those who had married more than once had, on average, 1.5 fewer births per woman than those married only once. A Malay woman married for 20 years or more and married only once had also, on average, 1.5 births more than one married more than once.[8]

The above evidence is supported by census data (rf. Table 2.31). Women who married more than once generally had lower average fertility than those married only once. A woman married for 20 years or more and who married once had, on average, one more birth than a woman married more than once. This is also true for a Malay woman. The number of cases of Chinese or Indian women who married more than once was too few and therefore cannot be examined separately.

2.3.3. AGE DIFFERENCE OF COUPLE AND FERTILITY

The evidence from the 1970 census (rf. Table 2.32) indicates that, except for the group where the wives were older than their husbands by 5 years or more, average fertility was positively related to the age difference between husbands and wives. This

Table 2.31

Mean Number of Children Ever Born by Years Since Marriage by Number of Times Married for Total Ever-married Wives and Malay Wives 15-49 years

Years Since First Marriage	Number of Times Married	
	Once	2 or more
Total		
less than 5	1.1	1.6
5 - 9	2.8	2.6
10 - 14	4.4	3.7
15 - 19	5.6	4.7
20+	6.3	5.2
Malays		
less than 5	1.0	1.6
5 - 9	2.7	2.6
10 - 14	4.3	3.7
15 - 19	5.5	4.7
20+	6.4	5.1

Source: Two Percent 1970 Census Data

is true even with sub-classification into racial groups. Malay average fertility was higher than Chinese average fertility except for the group where the husband was 10 or more years older than his wife. In this group, the Chinese couple had, on average, 0.5 of a child more than the Malay couple.

For the 1974 MFFS data, if years since first marriage is controlled, one finds that except for the first category of years since first marriage of less than 5 years and the last category of

Table 2.32

Mean Number of Children Ever Born by Age Difference between Husband and Wife for Wives between 15-49 years of Age

Age Difference (Husband-Wife)	Mean Number of Children Born
Total	
less than -5	4.4 (347)
-4 to -1	4.0 (1090)
0 to 4	4.2 (6728)
5 to 9	4.5 (6652)
10+	4.8 (4737)
Malays	
less than -5	4.4 (250)
-4 to -1	4.2 (582)
0 to 4	4.3 (3670)
5 to 9	4.5 (3976)
10+	4.6 (2935)
Chinese	
less than -5	4.3 (70)
-4 to -1	4.0 (402)
0 to 4	4.2 (2480)
5 to 9	4.2 (1871)
10+	5.1 (1050)

( ) actual number

Note: The sample consists only of households where the man was the head of the household.

Source: Two Percent 1970 Census Data

wives whose husbands were older by 10 years or more (rf. Table 2.33), the above pattern of a positive relationship holds. This pattern holds also for the Malay race. For the Chinese, however, average fertility does not vary very much for the various categories of age difference by years since first marriage categories.

Table 2.33

Mean Number of Children Ever Born by Age Difference Between Husband and Wife for All Ever-married Women by Years since First Marriage, 1974 MFFS

Age Difference	Years since first mariage				Total
	<5	5-9	10-14	15+	
Total					
less than -5	*	*	*	4.6	4.0
-4 to -1	1.1	2.8	4.0	5.9	3.8
0 to 4	1.1	2.8	4.1	6.2	3.9
5 to 9	1.0	2.9	4.2	6.4	4.4
10+	1.1	2.7	3.7	5.8	4.6
Malays					
less than -5	*	*	*	4.5	
-4 to -1	0.9	2.5	3.6	5.6	
0 to 4	1.0	2.6	4.0	6.0	
5 to 9	1.0	2.8	4.0	6.3	
10+	1.0	2.5	3.4	5.5	
Chinese					
less than -5	*	*	*	*	
-4 to -1	1.3	3.0	*	6.6	
0 to 4	1.2	3.0	4.1	6.5	
5 to 9	1.1	3.0	4.3	6.6	
10+	1.3	3.0	4.3	6.1	

*less than 30 cases

2.4. SUMMARY OF RESULTS

In this chapter, it was shown that both the Malays and the Chinese were postponing marriage to older ages. Evidence presented on the proportion ultimately marrying indicates that the proportion

remaining single may rise in the future. Although divorce rates of Malay women remained very much higher than those of the Chinese or Indian women, they are showing signs of decline. Due to the decline in the age difference between the spouses and the decline in mortality, marital disruption due to widowhood is also declining. There was a higher proportion of remarriages for Malays than for Chinese partly because more Malay marriages were dissolved. Malay women who divorced at younger ages tend, generally, to remarry quickly while those widowed at younger ages tend to take longer to remarry.

There is a decline in the incidence of polygyny because of increasing urbanisation, higher education and increasing awareness among women of their rights. Marriages are also less likely to be arranged and most young people choose their mates with parental approval or if the marriages are arranged, the young people are usually consulted on the choice. As regards marrriage arrangements, most couples do not do away entirely with traditional arrangements of marriage. They usually combine traditional with more 'modern' forms of marriage arrangements. After marriage, most couples live with either set of parents for at least a short period even though the general opinion is that they prefer to live on their own.

The number of people who intermarry across ethnic groups is small. The most common type of inter-marriages were between Malays and Chinese and Malays and Indians. Available evidence does not indicate that those who intermarried were those who married before. The evidence does indicate that those who intermarried tend to have

at least 6 years of education and tend to be those whose husbands were older than the wives by 10 years or more.

Between 1947 and 1970, the average fertility of women aged 30 years and over was increasing over time. The increase was observed by a number of researchers and many reasons were suggested to explain it. Over this period, Chinese women aged 30 years and over had higher average fertility than comparable Malay women. For all age groups, the 1980 Census indicates that the mean number of children ever born was lower than the 1970 Census and the Chinese had fewer children ever born than the Malays. This decline in fertility was observed for women below the age of 30 years in the 1957-70 period and also for the Malay and Chinese women separately.

Age at first marriage was found to be negatively related to the fertility level. Average fertility was also lower for women married more than once. A positive relationship was found between average fertility and the age difference between husbands and wives. In subsequent chapters, the relationship between nuptiality and fertility will be studied in more detail by controlling for other variables. Also, the effects of some determinants on age at marriage and birth timing will be investigated. All analyses will be carried out with the cohort frame in mind separately for the Malay and the Chinese women. The techniques of analyses and the methodological framework are described in detail in the next chapter.

Appendix 2.1[9]

Percentage Distribution of Respondents by Type of Marriage Arrangements from Various Studies

Source	Choose partner with parental approval	Arranged by parents with individual's consent	Without parental approval	N	Description of sample
1. Kaur (1979:37)	77	20	3	100	Chinese wives in Kelang, Selangor.
2. See (1979:27)	34	65	1	107	Chinese women in Buloh Kasap, Segamat, Johore.
3. Abdul Halim (1979:Chap. 3)	55	43*	2	100	Malay males in Kampung Pasir, Johor Bahru, Johore.
4. Zalaluddin (1980:Chap. 3)	53	34 (8)	5	105	Malay males in Kampung Belukar, Mukim Ulu Sat, Macang, Kelantan.
5. Mustafar (1980:18)	40	51 (3)	6	111	Malay males in Kampung Pengkalan, Kubor, Kelantan.

*It is not stated whether the persons involved were consulted by their parents

Note: Figures in brackets indicate marriages arranged by relatives or friends.

ADDITIONAL NOTES (CHAPTER 2)

Page numbers in brackets at the end of each note refer to the relevant page in the text of the thesis.

Note 1 (Table 2.4, p. 37)

The mean values cannot be calculated from the household record forms because information on age at first marriage was not collected for this part of the 1974 MFFS or the 1966-67 MFS.

Note 2 (Table 2.13, p. 48)

Generally, the figures indicate that the age difference between spouses has narrowed across birth cohorts as well (rf. figures below).

Mean Age Difference (in years) between Couples by Race by Birth Cohorts

Race/ Birth Cohort	Age Difference	N
Malays		
1945-49	5.8	634
1940-44	6.3	567
1935-39	6.4	631
1930-34	7.6	447
Chinese		
1945-49	4.4	416
1940-44	4.4	417
1935-39	4.6	353
1930-34	5.8	316
Indians		
1945-49	6.9	111
1940-44	7.5	94
1935-39	8.6	102
1930-34	9.8	91

[1]Some of these factors will be tested in subsequent analysis. (p. 31)

[2]The unbalanced sex ratios of the Chinese and Indians in the nineteenth and early twentieth centruies would have significantly affect the proportion of men ultimately marrying. The majority of the Chinese

and Indian immigrants during the period were males. The sex ratios in 1931 were 486 and 514 females per thousand males while in 1921, the figures were 424 and 371 respectively (Jones and Sidhu, 1981a: 30). (p. 38)

[3]Maznah's study was based on 1710 marriage and divorce vital registration records collected from the Pusat Penyelidikan Islam, Kuala Lumpur, and the Kathi Court of the Federal Territory, Malaysia. She found that the two most common types of divorce were the talak and the taalik. The wife often initiates the divorce by persuading the husband to divorce her through talak. This study is the only published source of data that the author is aware of that provides the reasons for divorce. As for the reliability of the specific reasons given for divorce, it must be recognised that this is a rather subjective matter, and it is likely that in many cases there were really multiple reasons for divorce. (p. 42)

[4]The decline in the practice of polygyny has probably had some effect in reducing divorce for the Malays, because polygyny was often a cause of divorce. The decline in divorce in turn would have some effect on the number of remarriages taking place. It appears that the attitude of Malay society is changing towards the practice of polygyny and divorce. It is probably true to say that increased education, particularly of women, has played an important role in this change. Increased education means that more years are now spent in school and this may delay marriage. (This hypothesis is tested in a later chapter). A higher education may mean a greater say in the choice of marriage partner (this is indicated in one or two small scale studies, as shown in the next section). Increased education of women may also mean better job opportunities and a greater say in decision making within the households. If the reasons for divorce given in Maznah (1975) can be generalised for the whole of Malaysia, these changes would lead to a decline in the number of divorces. (p. 54)

[5]Palmore et al. (1970) using the same data set but taking into account these two factors found that

(i) Chinese women were more likely to live with the husband's than their own parents while Malay women were more likely to live with their own parents;

(ii) Women in the age group 15-24 years were more likely to live with parents immediately after marriage than were older women;

(iii) Wives currently living in rural areas or those with less education were less likely than those living in metropolitan areas or more educated wives to live with parents immediately after marriage;

(iv) Wives whose husbands had moderate incomes were more likely than those with high or low incomes to live in extended units at the time of interview or immediately after marriage.

(p. 64)

[6]The changes in the trends in age at marriage and divorce (of Malays) may affect the ability of children to live with parents. The trends are leading to less likelihood that children will live with their parents after marriage. (p. 65)

[7]During this period, the surplus of Chinese males would have increased their propensity to marry women from other ethnic groups. (p. 68)

[8]Although not directly comparable (because the 1966-67 MFS was based on currently married women), evidence based on this survey indicates that once-married women had more live births than those married more than once. This was also found to be true when the analysis was carried out for Malay women only (Palmore and Ariffin, 1969). (p. 81)

[9]The wide differences between Kaur (1979) and See (1979) deserve comment. There may be a number of reasons. In practice, it may not always be easy to distinguish between choosing a partner with parental approval or consenting to a marriage partner arranged by parents. The studies were conducted in two different states where practices could differ. Also, the sample sizes were small. Despite all these drawbacks, it is believed that such results are worth presenting because no other studies are available. (p. 87)

CHAPTER 3

CONCEPTUAL FRAMEWORK AND METHODOLOGY

In this chapter, the framework of analysis together with the hypotheses to be tested and the data and techniques of analysis are presented. Various problems of statistical biases are also discussed towards the end of the chapter.

3.1. CONCEPTUAL FRAMEWORK

In any society, two types of changes occur simultaneously. First, people are growing older and cohorts are dying off and replacing each other. Second, the society is changing, for example,in terms of roles, beliefs and values, or in terms of the age structure of the population. This is a two-way process. First, when social change is rapid, each successive cohort is noticeably different from its predecessor in terms of various characteristics such as education, income, nutrition and life experiences; over time each cohort continues to be affected by the changing social environment, which affects them differently because of their different ages and characteristics. The unique set of experiences of successive cohorts can lead to change in their behaviour. A simple example is the effect of war or education on a particular cohort. Secondly, the succession of cohorts with different characteristics causes social change - change occurring in some cases to suit the needs of different cohorts. In a particular period, the society comprises various cohorts which interact with each other and together cause changes in the society. These changes will in turn influence the behaviour of cohorts in the

next period. Thus, models that include age, period and cohort effects seem relevant to the study of changes in marriage patterns on fertility. The age of a person is closely related to fertility in that it indicates, almost completely, the amount of exposure to risks of childbearing. The cohort to which a person belongs reflects the social, economic and cultural setting common to all members of the cohort as it moved through particular ages, although of course different members of the cohort experienced and reacted to this setting in different ways. If T represents the birth cohort and t the time period, then age a = t - T. It is important to distinguish between cohort and period effects because (a) a change in the tempo (age distribution) of cohort fertility produces an effect on the quantum of period fertility, even if the quantum of cohort fertility remains the same, and (b) a change in the quantum of cohort fertility produces a change in the tempo of period fertility even when there is no change in the tempo of cohort fertility (Ryder, 1981:470-471).

Henry (1961) has demonstrated that, in the absence of deliberate control, age can be used to indicate the fecundity of a woman over her reproductive life span. It has therefore been generally expected that a strong relationship between age at marriage and fertility will exist whenever fertility is not widely or effectively controlled (Busfield, 1972; Bumpass and Mburugu, 1977). Trussell et al. (1979) showed empirically that marital fertility is significantly influenced by age at marriage and marital dissolution only when contraception is practised; if fertility is natural, the effect is slight. In effect, changes in nuptiality in the case of natural fertility, affect age specific fertility only through the proportions married at each age. Freedman (1968) proposed that the level of fertility is more or less controlled by cultural norms about family size and such related matters as marriage, timing of intercourse, and abortion. He further

argued, with evidence from various studies, that some form of birth control was available in many of the underdeveloped areas but that it was cultural pressures which kept fertility at a high level. These cultural pressures, he continued, were not a result of unrestrained maximum fecundity but were an adjustment mainly to the high mortality and to the dependence on the kinship-based local institutions. In a later article, Freedman (1979) focused on marital fertility decline as an important response to changing costs and benefits of children and among other factors, cultural factors were found to affect both the demand for children and the readiness to accept birth control. As pointed out by Knodel and van de Walle (1979), much of the fertility decline in Europe took place before modern contraceptives or safe medical abortion were readily available.

Davis and Blake (1956) have provided a useful classification of such control factors affecting fertility level in a society (the Davis and Blake classification is listed in Appendix 3.1). These 'intermediate variables', as they called them, are the only ones that can affect the fertility level and all social influences affect fertility through the 'intermediate variables'. Different combinations of these 'intermediate variables' may produce similar levels of fertility. Some of the values of these variables may be similar for societies with very different levels of fertility. These control variables need not be consciously manipulated to limit fertility, but may do so through an unintended consequence of cultural influences. Coale and Tye (1961) have shown that high fertility in some Chinese populations resulted from late marriage followed by very high reproduction rates in the later childbearing years. The same level of completed fertility can be attained by early marriage and

high reproductive rates in the early childbearing years. The only difference is that the former will result in a slower rate of population growth in the long term because of a greater length of generation.

There are two modes of temporal aggregation one can use to examine a time series of parameters over the reproductive life span, that is real cohorts or synthetic (period) cohorts. The advantage of using real cohorts is that the influence of the past on the future can be studied. Such an approach, however, has the disadvantage in that one has to wait for a cohort to reach an advanced age to make a summary. The use of synthetic cohorts allows one to study the changes in fertility and its determinants which affect all cohorts in more or less the same way at the same period of time. The main disadvantage is that it is difficult to separate cohort effects from period effects. The interrelation of the two approaches will therefore be considered.

The next question relates to what kind of cohort to use. The vital statistics and censuses have information only on birth cohorts.[1] The 1966-67 Malaysian Family Survey and the 1974 Malaysian Fertility and Family Survey were based on sample frames of birth cohorts, of currently married and ever-married women respectively. From the surveys, information on real marriage cohorts can also be obtained. The use of real marriage cohorts is superior to the use of real birth cohorts if the range of the distribution of ages at marriage is large. For example, women from a particular marriage cohort will all be married at the same period of time and will be affected by the same set of events. Women from a particular birth cohort married at very

different ages will be affected by different sets of events. If the range is small, there will be little difference in the composition of birth and marriage cohorts. As fertility information on marriage cohorts is available from only two cross-sectional surveys collected seven years apart, both marriage and birth cohorts will be used.

The framework of analysis therefore examines cohorts of women with similar background and socioeconomic characteristics, where the same social structural norms apply, to see how their nuptiality and fertility behaviour differ or are similar. With the cohort frame in mind, the study will be carried out in two parts. In the first part, the study concentrates on the nuptiality patterns of the Malay and the Chinese cohorts. The Coale-McNeil Nuptiality Model Schedule is fitted in this section, wherever data permit. Also, the determinants of the changes in nuptiality patterns are explored using various background variables, such as race, childhood residence, education and work status before marriage. The importance or significance of these variables are referred to in the relevant sections later. Automatic Interaction Detector or Searching for Structure (AID3)* is used to see whether any of these background variables interact with one another. Subsequently, techniques, such as multiple classification analysis or log-linear analysis, are used to estimate their effects on changes in nuptiality patterns.

In the second part, the analysis relates the changes in

---

*AID-search algorithm utilises essentially a repeated one-way analysis of variance technique to explain as much of the variance of a dependent variable as possible. For details, see Sonquist et al., 1974.

nuptiality patterns to the changes in fertility[@] patterns or birth timing. AID3 is used to see whether the determinants of fertility (or birth timing) interact with one another and multivariate techniques such as analysis of variance, multiple classification analysis and GLIM, an interactive weighted least squares technique of fitting log-linear models or proportional hazards models, are used to estimate the effect of the changes in nuptiality on fertility (or birth timing). In the final section, an attempt is made to clarify or explain the macro time trends in fertility and nuptiality in Peninsular Malaysia in terms of the observed patterns for cohorts.

3.2. SOURCES OF DATA

Data sources used for this study include census data, vital registration data, where available, and data from two surveys, the 1966-67 Malaysian Family Survey (MFS) and the 1974 Malaysian Fertility and Family Survey (MFFS). Most of the analysis will be based on the 1974 MFFS while data from the 1966-67 MFS are used for comparison, where applicable, as only currently married women were covered in this survey. Data from other sources[**] are used only to confirm or supplement the results of the analysis. In the next two sections, the method and coverage of the two surveys[*] are briefly described.

[@] Two measures of fertility are used, namely the mean number of children ever born, and a measure of cumulative fertility suggested by Boulier and Rosenzweig (1978). The latter measure known as DRAT is explained in Appendix 3.2.

[**] Such as the Two Percent 1970 Census data, which comprise a random sample of one out of every 50 households listed.

[*] Full descriptions of each of these surveys are given in the respective reports.

3.2.1. The 1966-67 MALAYSIAN FAMILY SURVEY (MFS)

The 1966-67 Malaysian Family Survey was based on a probability stratified sample** of all non-institutional households in Peninsular (West) Malaysia. It was designed to obtain data on fertility and family planning for a sample of representative married couples in their child-bearing years in Peninsular Malaysia. Therefore, besides household interviews, intensive fertility survey interviews were also carried out. Altogether 7,697 household interviews and 5,457 intensive fertility survey interviews of currently married women 15-45 years of age were carried out. The response rate was high, about 94 percent.

A 'household' in this survey was defined as a group of persons (1) sleeping under the same roof and (2) sharing food from 'the same pot'. A person who failed to meet the first criterion was treated as a member of the household where he or she normally slept. If the person failed to meet the second criterion, he or she was listed as a member of a separate household at the same address.

3.2.2. The 1974 MALAYSIAN FERTILITY AND FAMILY SURVEY (MFFS)

The 1974 Malaysian Fertility and Family Survey was based on a sample of non-institutional households. It was designed as part of the World Fertility Survey (WFS) programme which aimed at studying human fertility and reproductive behaviour and to gather data on

---

** The population was divided into three major strata: the five largest metropolitan areas, the other urban areas (population 7,660-74,999 in the 1957 Census), and the rural areas (less than 7,660 in the 1957 Census).

knowledge, attitudes and practice (KAP) of family planning. As in the 1966-67 MFS, screening interviews were first carried out, followed by intensive interviews of eligible respondents. Out of the 41,852 persons screened, the final interview was conducted on 6,321 ever-married women below 50 years of age. The response rate was about 99 percent.

The de jure concept of usual members of a household was used. In case of ambiguity, a three months time reference was used as the criterion to establish 'usual residence'.

3.3. TECHNIQUES OF ANALYSIS

Most of the multivariate techniques used to estimate the effects of the variables specified in the model are familiar to demographers and social scientists. Hence, only the maximum likelihood method and the proportional hazards model are described in this section.

3.3.1. AGE AT MARRIAGE MODEL (COALE-MCNEIL MODEL NUPTIALITY SCHEDULE)

Coale (1971) has presented empirical evidence from a wide variety of populations that indicate that the distribution of age at first marriage in a female cohort has the same basic form, differing only in the location (mean) and a scale factor of age at marriage (standard deviation) and the proportion of the cohort eventually marrying. The form utilised is an expression derived by McNeil (Coale and McNeil, 1972):

$$g(a) = c(0.1946)/k)\exp\{(-0.174/k)(a - a_0 - 6.06k)$$

$$- \exp [(-0.2881/k)(a - a_0 - 6.06k)]\} \qquad (3.1)$$

where $g(a)da$ the proportion of cohort at age a experiencing first marriage in the interval a to a+da

c the proportion who ever marry

a_0 the earliest age of a consequential number of first marriages

k a scale factor (k indicates the tempo of the transition of a cohort from the never-married state to the proportion ever-marrying, which is indexed by c)

The mean age at marriage is $a_0 + 11.37k$, and the standard deviation is $6.58k$.

A new standard with mean 0 and variance 1 (analogous to the standard normal distribution) can be obtained from equation (3.1) above (Rodriguez and Trussell, 1980):

$$g_0(z) = 1.2813 \exp \{ -1.145 (z + 0.805)$$

$$- \exp [-1.896 (z + 0.805)]\} \qquad (3.2)$$

The schedule of age at first marriage, g(a), is related to this new standard as follows:

$$g(a) = \frac{c}{\sigma} \; g_0 \left(\frac{a - \mu}{\sigma} \right) \qquad (3.3)$$

where μ the mean age at marriage (only those who marry)

σ the standard deviation of age at marriage (only those who marry)

c proportion who ever marry

The age schedule of proportions ever married G(a) is related to the new standard nuptiality function G_0 as follows:

$$G(a) = G_0 \left(\frac{a - \mu}{\sigma} \right) c \qquad (3.4)$$

where

$$G_0(z) = \int_{-\infty}^{z} g_0(t) \, dt \qquad (3.5)$$

INDIVIDUAL DATA OF EVER-MARRIED WOMEN*

In a sample where only ever-married women are included, each cohort is represented only by those who have married before the time of interview. The distribution of age at marriage is therefore truncated by the age at interview. One is therefore working with

---

* This follows the method described in Rodriguez and Trussell, 1980, Chap. 3.

conditional probabilities of marriage rather than marriage frequencies. It also means that if one fits the Coale-McNeil model nuptiality schedule one would be able to estimate μ and σ, governing the age at marriage but not c, the proportion of the cohort ultimately marrying. c will be estimated using other sources of data and this will be discussed later.

The suggestion is to fit the model nuptiality schedule for all married women, excluding those marrying at their current ages. Therefore, if

x = age at interview in completed years, ranging from x_0 to x_1

a = age at marriage in completed years, ranging from a_0 to x, for the cohort aged x

m_{ax} = number of women married at age a completed years and now aged x completed years

m_x = total number of ever-married women aged x completed years at the interview,

then,

$$m_x = \sum_{a=a_0}^{x-1} m_{ax} \qquad (3.6)$$

The numbers, m_{ax}, married at each age $a < x$ for the cohort aged x are treated as having a multinomial distribution with parameters m_x and $\Pi_{a/x}$ ($\Pi_{a/x}$ = probability of marrying between exact ages a and a+1 conditional on marrying by exact age x). The likelihood of the

data for the cohorts x_0 to x_1 is a product multinomial distribution. The logarithm of the likelihood is therefore

$$\log L = \sum_{x=x_0}^{x_1} \sum_{a=a_0}^{x-1} m_{ax} \log (\Pi_{a/x}) \qquad (3.7)$$

Maximising equation (3.7), the unrestricted maximum likelihood estimators (MLE), $P_{a/x}$, of the conditional probabilities can be obtained, that is,

$$P_{a/x} = m_{ax} / m_x \qquad (3.8)$$

the sample proportions of women married between ages a and a+1 among those married by exact age x.

Under the Coale-McNeil model nuptiality schedule, the probability of marrying between exact ages a and a+1, conditional on marrying by exact age x is given by

$$\Pi_{a/x} = \frac{G(a+1) - G(a)}{G(x)} \qquad (3.9)$$

where G denotes the cumulative distribution function of age at marriage with parameters μ and σ. Expression (3.9) is simply the ratio of the probability of marrying between exact ages a and a+1, conditional on ever-marrying, to the probability of marrying by exact age x conditional on ever-marrying. The log-likelihood function (3.7)

under the model (3.9) becomes

$$\log L = \sum_{x=x_0}^{x_1} \sum_{a=a_0}^{x-1} m_{ax} \{ \log [G(a+1) - G(a)] - \log [G(x)] \} \qquad (3.10)$$

The model is estimated using the computer package NUPTIAL written by Rodriguez and Trussell.

Other estimates of the age at marriage are obtained by preassigning the value of c, the proportion ever marrying, based on an independent data source, such as the census.

HOUSEHOLD AND INDIVIDUAL DATA

Estimates of the mean age at first marriage may also be obtained by fitting the model schedule simultaneously to both individual and household data as described below (taken from Rodriguez and Trussell, 1980, Chap. 4).

For a real cohort aged x ($x_0 \leq x \leq x_1$), the household data are treated as having a binomial distribution with parameters n_x and Π_x where n_x denotes the total number of women aged x completed years at the interview and Π_x denotes the probability of being ever-married by age x completed years, and the individual data as having a multinomial distribution with parameters m_x and $\Pi_{a/x}$, as described earlier. Here, the model schedule is fitted simultaneously to household and individual data. The joint likelihood of the data is therefore

$$\log L = \sum_{x=x_0}^{x_1} \{ m_x^H \log \Pi_x + (n_x - m_x^H) \log(1 - \Pi_x) + \sum_{a=a_0}^{x-1} m_{ax} \log (\Pi_{a/x}) \} \qquad (3.11)$$

where m_x^H denotes the number of ever-married women age x completed at the interview, estimated from household data.

The log-likelihood under the model is also the respective sums, that is

$$\sum_{x=x_0}^{x_1} \{ m_x^H \log [F(x + 0.5)] + s_x^H \log [1 - F(x + 0.5)] + \sum_{a=a_0}^{x-1} m_{ax} (\log [G(a + 1) - G(a)] - \log G(x)] \} \qquad (3.12)$$

where $s_x^H = n_x - m_x^H$

Again, the NUPTIAL package is used to obtain the various estimates.

3.3.2. PROPORTIONAL HAZARDS MODEL

The proportional hazards model was first suggested by Cox (1972) and its application to demographic analysis is described in Menken et al. (1981). The assumptions of this model are:

(i) at each duration,* there is a hazard, or risk, which applies to all individuals, that the event of interest will occur

(ii) the risk at each duration is proportionally greater or less according to the characteristics of these individuals.

The model in notation form is as follows:

$$\mu_i(d) = e^{\lambda(d)} e^{\beta' Z_i} \qquad (3.13)$$

where

$\mu_i(d)$ the risk, or hazard, of an event (for example, marriage, death or failure) at duration d (since the previous event) for the ith individual

$e^{\lambda(d)}$ the underlying duration-dependent risk

β' a row vector of coefficients

Z_i a column of covariates for person i

The exponent of $\beta' Z_i$ is a sum, $\beta_1 Z_{i1} + \beta_2 Z_{i2} + \ldots\ldots$ If Z_{i1} is a dummy variable which is equal to one if the person has that characteristic, then $e^{\beta' Z_i}$ measures the relative risk of having this characteristic. For categorical covariates, the risks are usually measured with respect to a reference group. All events are assumed to

---

*Duration here is the time since marriage, or since the previous birth, or some other marker event.

occur at the midpoint of the interval.

METHOD OF ESTIMATION

One approach employs the likelihood function. In many cases, it is easier to use the log-likelihood function. The log-likelihood function is

$$\Lambda = \sum_{k=0}^{K} \{S_k \alpha_k + \beta' V_k - e^{\alpha_k} \sum_{i \in R_k} \delta_i e^{\beta' Z_i}\} \qquad (3.14)$$

where

S_k the number of events in the interval $[d_k, d_{k+1})$

V_k the sum of the vectors of Z_i for those individuals who experience this event in the interval $[d_k, d_{k+1})$

R_k the set of persons (i = 1,2,.....,N) who are exposed to risk in the interval $[d_k, d_{k+1})$

δ_i the amount of exposure in the interval d_j to d_{j+1} contributed by the individual

K the maximum duration considered

Taking derivative with respect to α_k yields

$$\frac{\delta \Lambda}{\delta \alpha_k} = S_k - e^{\alpha_k} \sum_{i \in R_k} \delta_i e^{\beta' Z_i} \qquad (3.15)$$

At the maximum,

$$\frac{\delta \Lambda}{\delta \alpha_k} = 0,$$

$$e^{\alpha_k} = S_k \; / \; [\sum_{i \epsilon R_k} \delta_i e^{\beta' Z_i}] \qquad (3.16)$$

$$\alpha_k = \ln (S_k) - \ln [\sum_{i \epsilon R_k} \delta_i \, e^{\beta' Z_i}] \qquad (3.17)$$

Substituting (3.16) and (3.17) into (3.14) results in a log-likelihood function that contains only the vector of β's as unknown parameters. This function must be maximised to obtain the maximum likelihood estimate (MLE) of the β's. MLE of the α's are obtained by substituting the values for the β's into equation (3.17).

Holford (1980) and others have demonstrated that the proportional hazards model and log-linear (multiple contingency table) models are equivalent if all covariates are in categorical form and time can be counted in units in which the underlying hazard rate is a constant. Log-linear models with the hazard rate as a dependent variable are therefore fitted as there is no computer package available at A.N.U. to use the first method described above.

Kay (1977) proposed a visual inspection for testing whether a proportional hazards model is appropriate. For a large sample, a statistical test can be used. However, if the number of covariates is large, it becomes impossible to perform this test or the visual examination of plots.

3.4. PROBLEMS OF STATISTICAL BIASES[2]

A discussion of the problems of statistical biases would indicate how one can best eliminate the bias in the empirical analyses.

The 1966-67 MFS was based on currently married women. The problem of using currently married women is that women whose marriage had dissolved (either by death of spouse or divorce) and who had not remarried at the time of interview would not qualify for the sample. If one uses the sample of currently married women to study the patterns of dissolution of marriage one will obtain an underestimate of the number of marriages that have dissolved. Furthermore, age at marriage may be affected if those who marry young are more likely to divorce. For other purposes, the samples seem comparable with each other.

Related to the above problem is the problem of truncation bias or censored data. In the samples, young women who choose to marry later or never are systematically excluded. Furthermore, with an incomplete observation period, the observed period, such as the interval from marriage to first birth, can be limited by the length of that observation period. One can limit the analysis to samples where truncation is not likely to be great or make some adjustment for the fact that different women will have different lengths of exposure to the risk of an event. Unfortunately, in correcting for truncation bias, these solutions invariably give rise to sample selection bias.

Sample selection or selectivity bias occurs because surveys have restricted age ranges of those interviewed or are restricted by certain characteristics, such as marital status. For example, the 1974 MFFS only covered ever-married women aged 15-49 years of age. This means that from the survey only certain events are available for analysis. Firstly, an event initiated at the age of 15 years could have taken place between 1940 and 1974 while one initiated at the age of 49 years could only have taken

place in 1974. Secondly, different birth cohorts have different ages of initiation. At the extremes, women of age 49 years could have initiated the events at any age between 15 and 49 years while women of age 15 years could only have initiated the events at the age of 15 years. Thirdly, the events would be initiated at different time periods. For example, an event initiated before 1950 would have to be initiated at the age of 23 years or younger while one initiated before 1945 had to be initiated at the age of 18 years or younger. Thus, as illustrated by the above three points, selectivity bias has to be taken into account in an analysis of survey data. But, as stated in the preceding paragraph, a solution to reduce the truncation bias would give rise to selectivity bias, and vice versa. In view of this, a certain amount of bias, whether truncation or selectivity, is unavoidable in the present analysis.

The other source of bias is what is referred to as the aggregation/disaggregation bias. In this study, data organised at different levels of aggregation will be used. There is therefore a problem of using research results obtained at different levels of aggregation, such as using observed micro behaviour to explain macro relations. Grunfeld and Griliches (1960) have shown that in practice, one does not know enough of micro behaviour to be able to perfectly specify micro equations and that aggregation produces not only an aggregation error but also an aggregation gain, it reduces the specification error* in the process of aggregation. One cannot say for certain whether a net gain results or not, but it is not improbable. This is especially so, as human behaviour cannot be perfectly specified. It is based on this argument that in the final analysis an attempt is made to explain macro relations between nuptiality and fertility using evidence on micro behaviour from survey data.

---

*According to Grunfeld and Griliches (1960:7), in many contexts, it is useful to think of specification error as the general term and aggregation error as a special case of the specification error.

In this study, as in other empirical studies, one is also faced with the problem of omission of variables, which influence the dependent variable and which are correlated with one or all of the independent variables, and errors of measurement in the independent variables. Theoretically, one can eliminate the first source of bias by including all the relevant explanatory variables in the analysis. Such a step, however, will not be practical as certain variables, such as taste and preferences, are either not quantifiable or have not been measured in the surveys. Furthermore, inclusion of all relevant variables means that one has to make sure all the explanatory variables are independent of the disturbance term and one also has to face the problem of multicollinearity.** In any case, one definitely will run out of observations. Crockett (1967:21-22) suggested two alternative approaches to overcome this problem. The first approach is to combine information from an identical sample in different years while the second is to combine homogeneous socio-demographic groups. Both approaches assume that unmeasurable characteristics are used as bases for grouping and are thus constant. Another way is to use independent variables which are known at time t and which contain no random variables, for example, exogenous variables.* In this study, it is hoped that this source of bias is minimised if one looks at cohorts of women controlled by race.

** Multicollinearity occurs when all or some of the variables in the function have similar trends or movements in the entire sample period. In this case, one cannot know for certain which is the main determinant of the dependent variable.

* The use of variables which are in fact not exogenous leads to other problems of estimation (see Tan, 1978, Chap. 3).

The next source of bias - errors of measurement - relates more to cross-section data. Some variables, such as age, tend to be less reliably reported. Such (non-constant) measurement error in age, or in any independent variable, will lead to a downward bias of the slope coefficient (Wold and Jureen, 1953:38-39). Such errors still persist even with grouped data. But should the percentage error be constant over classes, an unbiased estimate can be obtained, if a logarithmic regression is fitted on data grouped by age groups, as all error terms will then be constant; for linear regressions, a constant (absolute) error term will lead to an unbiased estimate (Crockett, 1967:23).

Finally, there is the problem of not being able to measure changes in the independent variables over time. Like most data sets, the independent variables are measured at a specific point in time and no information is available about what changes have occurred from the time of first marriage to influence the level of fertility or birth timing. It is difficult to say what bias this may have on the results but as the interest is on average group behaviour rather than on individual behaviour, these changes are likely to be random and should not unduly influence the final results.

Appendix 3.1

Intermediate Variables Affecting Fertility

(from Davis and Blake, 1956:211-235)

I. Factors affecting exposure to intercourse

A. Those governing the formulation and dissolution of unions in the reproductive period.

1. Age of entry into sexual unions
2. Permanent celibacy: proportion of women never entering sexual unions
3. Amount of reproductive period spent after or between unions
   (a) When unions are broken by divorce, separation or desertion
   (b) When unions are broken by death of husband

B. Those governing the exposure to intercourse within unions

1. Voluntary abstinence
2. Involuntary abstinence (from impotence, illness, unavoidable but temporary separations)
3. Coital frequency (excluding period of abstinence)

II. Factors affecting exposure to conception

A. Fecundity or infecundity, as affected by involuntary causes

B. Use or non-use of contraception

1. By mechanical and chemical means
2. By other means

C. Fecundity or infecundity, as affected by voluntary causes (sterilisation, subincision, medical treatment, etc.)

III. Factors affecting gestation and successful parturition

A. Foetal mortality from voluntary causes

B. Foetal mortality from involuntary causes

Appendix 3.2

A Measure of Cumulative Fertility

(based on Boulier and Rosenzweig, 1978)

If one assumes a woman is married once and is still married at the date of the survey, then

$$DRAT(a) = C(a) / \int_{m}^{a} n(x)\, dx$$

where DRAT the duration ratio

C(a) the number of children ever born at age a

n(x) the natural fertility* at age x

m age at marriage

The calculation of DRAT requires the selection of a natural fertility

---

*According to Henry (1961), natural fertility is marital fertility in the absence of voluntary control.

schedule for standardising the duration of marriage. If the age schedule of natural fertility accurately describes the level of fecundity of the woman, then DRAT measures accurately the ratio of her actual to 'potential' marital fertility. As newly married women at age a are not representative of the population in terms of their risk of becoming pregnant, the suggestion is to exclude women who have been married, say, less than five years.

Tests in the above study showed that the use of the duration ratio (as opposed to the use of children ever born)* as a dependent variable provides unbiased estimates of the effects of socioeconomic variables on the level of marital fertility control for women of all ages, without the need for sample stratification or age variables designed to reflect biological factors, if fertility control begins soon after marriage in the population. Other tests showed that the duration ratio may be used even in populations characterised by late initiation of control. It is also shown that these results are not affected if the level of fecundity varies stochastically in the population or if the level of the natural fertility schedule chosen to compute DRAT is incorrect.

---

*Tests showed that biased coefficient estimates are obtained for the socioeconomic variables if the number of children ever born is used as the dependent variable, unless very fine sample stratification by age is applied. It is claimed that such coefficient estimates even with sample stratification are ambiguous in that they reflect the influence of socioeconomic variables on both age at marriage and fertility control within marriage.

ADDITIONAL NOTES (CHAPTER 3)

Page numbers in brackets at the end of each note refer to the relevant page in the text of the thesis.

[1]The 1970 Census did not have a direct question relating to marriage duration. It would have been possible to obtain information on marriage duration by using the information on current age and age at marriage. However, as the 1970 Census was collected for other purposes, no reliability checks were carried out to determine the accuracy of the answers to these questions. Unofficial sources from the Department of Statistics recommended that the information on marriage duration should not be obtained in this manner. Hence only the information on birth cohorts was used. (p. 91)

[2]This section deals with the biases that are likely to be met with in the statistical analyses of the data sets in the thesis. These biases may result because of the coverage of the data set (that is whether it includes only currently married women or ever-married women and whether it excludes women of a particular age range) or from measurement errors or from the way the variables concerned are measured. The section does not deal with the problem of statistical interpretation but rather on how to overcome the statistical biases.
The discussion on aggregation bias is relevant in the sense that in the final analysis, an attempt is made to explain the macro relations between nuptiality and fertility using evidence on micro behaviour from survey data. The problem of misspecification was referred to on p. 106, beginning on the eighth line from the bottom of the page. It was again referred to on p. 107. When variables are omitted from an equation, this is a problem of misspecification. Measurement errors were discussed on p. 108.
One can only talk in general terms and assume that statistical biases do exist in all data sets. The points raised in this section are simply to clarify what the thesis intends to do to reduce these possible sources of biases. (p. 105)

percent per annum, resulting in further rise in per capita income and major structural shifts in the economy (rf. Fourth Malaysia Plan, 1981:9). Over the 1957 - 1980 period, the agriculture sector grew at a slower rate compared to the manufacturing and construction sector. For example, in 1970 the share of agriculture in GDP was 30.8 percent but this declined to 22.2 percent in 1980. The manufacturing sector, on the other hand, increased sharply from 13.4 percent in 1970 to 20.5 percent in 1980 while construction increased from 3.9 percent to 4.5 percent over the same period (Fourth Malaysia Plan, 1981:12).

Forty nine percent of the households in 1970 (1970 Population Census) had incomes below the poverty line, using a definition of income necessary for minimum nutritional and other non-food requirements of a household as used in the Malaysia Plan. The bulk of these households were in the rural areas, that is 684,000 households or 86 percent of all households in poverty. Some 74 percent of the poor earned their livelihood from agriculture and the processing of agricultural products. The Fourth Malaysia Plan (1981:33) estimated the incidence of poverty at 44 percent in 1975 and 29 percent in 1980.*

---

*Income distribution studies, such as that by Lim (1974), indicate a worsening situation in the 1960s compared with the 1950s.[1] Note that in 1980, 65.2 percent of the Malays were estimated to be in the rural areas compared with 24.7 percent of the Chinese (Fourth Malaysia Plan, 1981, Table 12-6). Further, over the 1970 - 1979 period, mean household income was estimated to have increased from M$120 to M$200 per month (constant 1970 prices) for the Malays compared with an increase of M$268 to M$383 per month (constant 1970 prices) for the Chinese (Fourth Malaysia Plan, 1981, Table 3-9).

During the sixties, Malaysia experienced a high degree of price stability; the consumer price index (CPI) rose less than one percent per annum on the average. The beginning of the decade of the 1970s saw the emergence of inflationary pressures in the economy. During the 1971 - 1979 period, the CPI rose at an average of 5.8 percent per annum. The increase was higher in the first half of the decade, 1971 - 1975, averaging 7.3 percent per annum, than the second half, about 4 percent per annum. The rapid increase in the first half was due mainly to the large increases in prices registered in 1973 (10.5 %) and 1974 (17.4 %) as a result of a world-wide increase in prices owing to the oil crisis. Although the CPI as a whole did not increase much in the second half of the 1970s, some of the components of the index continued to increase quite rapidly. For example, the cost of medical care and health related expenses rose by 6.1 percent per annum, rent, fuel and power by 5.8 percent and clothing and footwear by 4.1 percent.

Thus, it seems that inflation in the 1980s is not as high as in the 1970s and real income has increased over time. This would mean that at the same age, the younger birth cohorts are better off in terms of income than the older birth cohorts. The trend in income is normally assumed to have a direct inverse relationship with fertility.* Studies on fertility differentials, however, show little support for such a relationship. Ahmad and Chander (1966:32-72) found that there is an inverted U-shaped relationship between income and

---

*According to behavioural models such as the 'home production' model (see papers collected in Schultz, 1974) secular economic growth affects female economic activity and fertility though the outcome is hard to determine because husband's income and wife's potential wage have an inverse effect and a positive effect, respectively, on the probability that the wife will work, but both are likely to be rising at the same time.

fertility for each of the three ethnic groups, the Malays, Chinese and Indians. The inverted U-shaped relationship between income or economic class and fertility was observed in a number of other countries (see Hull and Hull, 1976; Jones, 1978:34-39). It has been suggested that the initial rise in fertility may be a result of access to medical facilities, changing patterns of marriage, marital disruption and post-partum behaviour in the early stages of the new demographic transitions. Later, fertility may fall with postponed marriage and increased use of efficient and direct methods of birth control (Hull and Hull, 1976:57). Other studies such as that by Palan (1979) and Fong (1973) found income or economic variables to be unimportant predictors of fertility behaviour. The lack of support for the hypothesized income-fertility relationship may be due in part to the fact that income is generally under-reported intentionally, particularly by those with high income, or because it does not include income in kind, particularly by those with low income. Several small-scale studies of urban squatter settlements and a Chinese new village have shown that fertility is inhibited by poverty and depressed economic conditions (Pirie, 1976; Tham, 1977; Chin, 1980).

Urbanisation and industrialisation are also thought to affect fertility behaviour. Although generally the average number of children ever born to women in the metropolitan and more urban areas tends to be smaller than for those in the rural areas, it is not clear whether urban location is responsible or whether the differentials are more a manifestation of other differences between urban and rural areas, such as the level of education, age at marriage and labour force participation. It is, however, generally agreed that the more urban the place of residence, the more likely a woman is to reflect

modern attitudes and norms, such as smaller family size and later age at marriage (Von Elm and Hirschman, 1979:888). Rural-urban migration can also reduce fertility either through delayed marriage because of educational opportunities or job participation or through new social norms. Pryor (1979:109-110) found that migrants tended to desire a smaller family size than non-migrants. The next section therefore looks at the changes in population distribution.

4.1.2. POPULATION DISTRIBUTION

Overall, since 1957, there has been rapid urban growth, in terms of the percentage change in the urban population, but a slow pace of urbanisation, in terms of the percentage point change in the ratio of urban population to total population.[2] Between 1957 and 1980, urban population was estimated to have increased by about One-and-a-half times but the proportion of total population living in urban places with a population of 10,000 and above increased from 27 percent to only 35 percent (Lim, 1981a:123). The 1980 Population Census (1983:16) estimated the proportion of population living in urban areas to be 37 percent. Malays comprised 27 percent of the urban population in 1970 but this figure increased to 38 percent in 1980 (1980 Census, 1983:20). The increase was mainly a result of rural-urban migration and substantial changes in urban boundaries. The Chinese comprised 59 percent of the urban population in 1970 but this figure dropped to about 50 percent in 1980. Thus, it is quite obvious that urbanisation has affected the Malays more than the Chinese.

After independence in 1957, population distribution was affected by two main factors: land development schemes and urbanisation. The land development scheme started with the establishment of the Federal Land Development Authority (FELDA) in 1956. The scheme was started to promote rural development in order to pacify Malay resentment of their economic weakness and to overcome the problems of their uneconomic holdings. Almost all the FELDA settlers were Malays and the land development schemes helped in the re-location of the Malay population to inland areas such as the Jengka Triangle in Pahang and the Johore Tenggara regions.

Rural-urban migration also contributed to significant movements of the Malay population. Sidhu and Jones (1981:9) estimated that one-quarter of the increase of 416,000 urban Malays between 1957 and 1970 was due to rural-urban migration. The increase was caused by several factors, the most important being the privileged position of Malays, provided by the Constitution, in government jobs, mostly in large towns, and their increasing participation in the commercial sector; the goverment's guideline was at least 30 percent Malay staff in commercial companies. With the introduction of the New Economic Policy (which aims at eradication of poverty among all races and the restructuring of society to eliminate the identification of race with economic function) Malay rural-urban mobility has almost certainly increased in the post 1970 period. The main push factors include the lack of economic, educational, medical and entertainment facilities in the rural areas. Figures from the 1980 Population Census (1983:83-84) also show a higher propensity to migrate per 1000 persons for Malays than for Chinese or Indians in the 10 year period before the Census.

Over the 1957-80 period, the Chinese also experienced significant changes in population distribution. The lifting of the Emergency in 1960 resulted in thousands of Chinese, formerly rural squatters who were forced to move during the Emergency, leaving the towns and returning home. Soon after, that is, in the post-1960 period, the process of rapid sub-urbanisation in the vicinity of the various state capitals resulted in widespread distribution of the Chinese population to these suburban areas. In 1970, the proportion of Chinese living in towns (with population of 10,000 and over) was 47 percent compared with 45 percent in 1957. The reason for this slight increase is because roughly 50 settlements which had been enumerated as urban centres in 1957 ceased to be urban by 1970 owing to out-migration both to rural areas and large towns (Sidhu and Jones, 1981:10).

Fertility decline is also postulated to be related to lower levels of mortality. The next section looks at trends in mortality.

4.1.3. LEVELS OF MORTALITY[3]

Since 1947, the crude death rate has been declining steadily (rf. Table 4.1). The decline in the crude death rate has been highest for the Malays although overall the Chinese still have the lowest rate. As the crude death rate is affected by age structure, age-specific mortality rates are presented in Table 4.2. The age-specific mortality rates are generally higher among males than females but in 1957 and 1967, women in the childbearing years of 15-39 exhibited a higher mortality level than the males, perhaps a result

of maternal mortality.*

Infant mortality is declining for all ethnic groups (Table 4.3). Compared with the other racial groups, Malay infant mortality has declined the fastest but in 1979, the Malay infant mortality rates were still higher than those for the Chinese. Further, Yusof and

Table 4.1

Crude Death Rate per 1,000 Population by Ethnicity in Peninsular Malaysia, 1947 - 1979

Year	All Groups	Malays	Chinese
1947	19.4	24.3	14.3
1957	12.4	14.9	9.8
1958	11.1	13.4	8.4
1959	9.8	11.6	7.9
1960	9.6	11.2	7.8
1961	9.4	11.1	7.4
1962	9.5	11.0	7.6
1963	9.1	10.6	7.4
1964	8.3	9.2	7.0
1965	8.2	8.8	7.0
1966	7.9	8.6	6.8
1967	7.8	8.3	6.7
1968	7.9	8.3	7.0
1969	7.6	7.9	6.8
1970	7.3	7.6	6.6
1971	7.1	7.4	6.4
1972	6.9	6.9	6.5
1973	6.9	6.9	6.4
1974	6.6	6.5	6.2
1975	6.4	6.5	6.0
1976	6.2	6.2	5.9
1977	6.3	6.3	5.9
1978	5.9	5.8	5.6
1979	5.8	5.8	5.6

Source: Monthly Statistical Bulletin, Peninsular Malaysia, Feb. 1982 and Sept. 1975

---

* In 1967, maternal mortality rate was 2.6 for Malays and 0.5 for the Chinese but in 1976, the Malay rate had declined to 1.2 while the Chinese was 0.2 (Monthly Statistical Bulletin, Sep. 1975).

Table 4.2

Age-Specific Mortality Rates per 1,000 population by Sex, 1957, 1967, 1977

	1957		1967		1977	
Age Group	Male	Female	Male	Female	Male	Female
Under 1	109.9	84.5	50.1	39.8	35.6	27.7
1-4	11.4	11.2	5.5	5.3	2.9	2.9
5-9	3.1	3.3	1.7	1.8	1.1	1.0
10-14	1.8	1.9	1.1	0.9	0.8	0.6
15-19	2.3	3.0	1.4	1.1	1.2	0.8
20-24	3.1	4.2	1.8	1.6	1.7	1.0
25-29	3.7	5.6	2.3	2.4	1.9	1.1
30-34	4.8	6.4	2.4	2.8	2.4	1.7
35-39	6.4	7.9	3.4	3.9	3.0	2.2
40-44	9.0	8.7	5.5	4.7	4.5	3.1
45-49	13.7	12.1	9.5	8.0	7.8	5.0
50-54	18.0	12.7	14.0	9.6	12.4	7.7
55-59	30.9	25.1	24.5	19.1	19.7	13.5
60-64	39.0	26.0	31.2	18.1	29.6	19.6
65-69	66.6	48.8	51.4	39.8	49.9	36.3
70+	100.1	81.0	72.3	60.0	82.9	60.3

Source: U. N. Demographic Yearbook, 1961:372-73
Vital Statistics - West Malaysia, 1967, 1977

Yusof (1974) noted that, although the overall Malay infant mortality rate was lower in the urban than the rural areas, Malay still birth and neo-natal rates were higher in urban than rural areas in a number of states in Peninsular Malaysia. Also, in six out of the eleven states, infant mortality rates of all racial groups were higher in the urban than in the rural areas. Reporting errors may account for these unusual results as reporting will tend to be more complete and reliable in the urban areas.

Education is often postulated to be negatively related to fertility. It has also been argued that the effect of mass education on the family economy is the primary determinant of the timing of the

onset of the fertility transition. The impact of education on fertility is not direct but through the restructuring of family relationships and hence, family economies and net wealth flow (see Caldwell, 1980).

Table 4.3

Infant Mortality Rate by Ethnicity, 1950 - 79 ('000 live births)

Year	All Races	Malays	Chinese	Indians	Others
1950	102	121	74	114	67
1957	76	96	47	76	34
1958	80	102	49	74	37
1959	66	84	41	63	25
1960	69	87	43	65	37
1961	60	78	34	54	32
1962	59	75	36	58	29
1963	57	72	34	53	37
1964	48	59	32	51	23
1965	50	61	32	53	30
1966	48	58	31	51	32
1967	45	53	30	52	29
1968	42	48	30	53	24
1969	43	49	31	52	29
1970	41	48	29	46	22
1971	39	46	25	45	38
1972	38	43	27	45	27
1973	39	43	28	46	32
1974	35	40	27	40	37
1975	33	37	24	38	28
1976	31	35	21	37	28
1977	32	36	23	37	25
1978	28	32	20	33	26
1979	27	31	19	30	23

Sources: Report of the Registrar-General on Population, Births and Deaths, 1950, 1957 - 62
Vital Statistics, 1963 - 79

4.1.4. EDUCATION AND LITERACY

At the time of Independence in 1957, an educational ordinance was passed. The main aim was ultimately to use Malay as the main medium of instruction,[4] but Malay and English were to be compulsory in all primary and secondary schools and instruction in other languages was to be made available where needed. An Education Review Committee recommended in 1960 that free primary education be implemented by 1962.* In 1964, the secondary schools entrance examination was abolished and this led to a flood of new entrants to secondary schools. The change in the medium of instruction from English to Bahasa Malaysia (Malay) began in 1970 and it has now replaced English as the main medium of instruction at almost all levels of education. There are five universities and a number of colleges, where it is widely acknowledged that entrance to the limited places is restricted by quota based on racial origin, that is the quota for Malay students is higher than for non-Malay students. In addition, to improve the intake of Malays in certain professional and technical fields in the universities, preparatory courses were set up for them in almost all universities (Fourth Malaysia Plan, 1981:350).

The traditional role of the Malay and Chinese married women was in the home. Their main function were to bear and rear children, to take care of the house, and to work in family enterprises.[5] Their education as young girls was usually informal although Malay girls learnt to read the Koran (in Arabic). Occasionally, they also learnt to read and write a little of their own language.

---

*Primary education in national primary schools (Malay-medium) was free even before this date (Wong and Ee, 1975:99).

Schools for girls were established from 1817. The majority of the girls' schools in the nineteenth century were run by missionary bodies or private individuals and they were attended mainly by European or Eurasian girls. After Independence in 1957, however, enrolment and continuation in educational institutions of local girls rose rapidly.

Between the 1957 and 1970 censuses, the proportion of literate Malay women aged 10 years and over increased from 29 percent to 51 percent. The 1980 Census (1983:105) reported that 69 percent of the Malay women aged 10 years and over were literate. The proportion of Chinese women aged 10 years and over who were literate increased from 34 percent in 1957 to 47 percent in 1970 and 65 percent in 1980. The Chinese literacy rate was above the Malay rate in 1957 but appears to have fallen behind by 1970. Standardisation by age distribution also indicate a lower literacy rate for Chinese women compared with the Malays in 1970. It is probable that the 1957 definition of literate included semi-literates as defined in the 1970 census or the 1980 census.* In the 1970 Census, inclusion of semi-literates among the literates results in a higher Chinese rate compared with the Malay rate. No similar cross-classification by ethnic group was available at the time of writing for the 1980 Census.

---

*The 1980 Census asked all persons aged 10 years and over whether they could read a newspaper, or a letter, and whether they could write a letter. On the basis of their replies, these persons were categorised as 'literate' if they stated they could read and write, 'semi-literate' if they could only read and 'illiterate' if they could do neither. In the 1970 Population Census (1975, II:8) a person aged 10 years and over was considered literate if he or she was able to read a newspaper and write a simple letter. A person who was able to read but not write was considered semi-literate, otherwise he or she was considered illiterate. The 1957 Population Census (1960:21) defined a person as literate if he or she was able to read a notice and write a letter, otherwise he or she was illiterate.

The 1957 census reported that 47 percent of Malay males aged 10 years and over were literate compared with 53 percent for Chinese men. In 1970, the literacy rate for Malay men was 73 percent compared with 70 percent for Chinese men. Again, if one combines semi-literates with literates, the Chinese rate was higher than the Malay rate. Standardisation by age distribution also reveals the same result. Another possible reason for the higher literacy rate in the 1970 Population Census is that Malays who could read and write in romanised script or Jawi (Arabic script) were considered as literate whereas in 1957 only those proficient in the romanised script were classified as literate (1970 Population Census, I:325). Young Malay males and females tend to include a higher proportion of literate than young Chinese males and females while a reverse pattern is observed for older males and females (rf. Appendix 4.1). The literacy rate by birth cohorts indicates an increasing trend from older to younger cohorts, excluding those 10-14 years at the time of the census, as many may be too young and could not be considered as literate according to the definition (rf. Appendix 4.1).** About 80 percent of both Malay and Chinese males aged 20-29 years in 1970 (those born in 1940 - 1950) who were in primary schools in 1950 - 1960 were literate compared with 50 percent of Malay males and about 60 percent of Chinese males who were in primary school in the 1920s and 1930s: men aged 50-59 in the 1970 Population Census and born in the 1910 - 1920 period. For the women, particularly the Malays, the improvement in literacy rate was quite large. For example, about 58 percent of Malay women aged 25-29 years (those born in 1945 - 1949) were literate

---

** Figures from the 1957 Population Census are not presented because they are not directly comparable with the 1970 Population Census figures. It is relevant to mention that in 1957 the trend in literacy rate increased from older to younger cohorts.

compared with 28 percent of women aged 35-39 years (those born in 1935 - 1939). Further improvement after 1970 is highly likely. Figures from the 1980 Census are not available at the time of writing.

Comparison of the figures on mean years of schooling for the Malay and Chinese women in the 1957 and 1970 censuses indicate a higher level of schooling in 1970 than in 1957 (rf. Table 4.4). The mean number of years of schooling was higher for Chinese women than Malay women. Other figures, such as the proportion of females in the 10-19 age group attending school (rf. Jones and Sidhu, 1981b:227) also support the above trend. Chinese men also had higher mean number of years of schooling than Malay men. The 1980 Census (1983:Chap. 6) reported a higher proportion of Malay and Chinese ever attending school by age groups than the 1970 Census. By age groups, the Chinese proportion ever attending school was slightly higher than the Malay proportion.

The negative relationship between education and fertility is strongly supported by Malaysian data. Chander et al. (1977:99) found that women with 7 years or more of education tend to have fewer children. The work by Ahmad and Chander (1966) also showed a negative relationship between education and fertility for the Indians and Malays but for the chinese, there was a weak positive relationship at low levels of education. The studies by Fong (1973), B. A. Tan (1981) and P. C. Tan (1981) also indicate that education is the most significant predictor of fertility behaviour. The effect of education on fertility is partly a result of marriage postponement. Available evidence indicates that those who have more than primary education tend to postpone marriage by several years compared with those with no

education or only primary education (Von Elm and Hirschman, 1979; Chander et al., 1977; Palmore and Ariffin, 1969).

Table 4.4

Mean Years of Schooling of Malay and Chinese Males and Females Above Age 19 Years, 1957 and 1970

Age Group	Malays 1957	Malays 1970	Chinese 1957	Chinese 1970
Males				
20-29	3.7	4.9	4.4	5.8
30-39	3.2	3.5	4.5	4.6
40-49	2.6	2.7	3.7	3.8
50-59	1.2	2.2	2.8	3.3
Total 20+	2.9	1.4	3.7	4.4
Females				
20-29	1.3	3.5	2.1	4.4
30-39	0.6	1.7	1.5	2.6
40-49	0.2	0.8	0.7	1.6
50-59	0.1	0.4	0.3	0.9
Total 20+	0.7	1.8	1.2	2.5

Source: 1970 Population Census Report, I:348

Another variable that is usually considered in the literature as a 'modernisation' factor that determines the negative relationship between socio-economic development and fertility is labour force participation, particularly in the modern sectors.

4.1.5. LABOUR FORCE PARTICIPATION

The 1957 census used a one year rather than a one week reference period to measure labour force participation. Presumably the 1957 census underestimated labour force activity since it excluded some

persons who would have been in the labour force according to the 1970 or the 1980 Census definition.* With this limitation in mind, the 1970** compared with the 1957 data show an increase in labour force participation of Malay women of all ages, an increase for younger Chinese women below age 45 and a decrease for older Chinese women (rf. Appendix 4.3). The increase in the labour force participation rate of younger women may be explained in terms of increased education and increasing employment opportunities for women. For the men, labour force participation shows a decline between 1957 and 1970 (rf. Appendix 4.3). The decline seems to occur across all age groups, in particular the very young and the old. The drop in the younger ages may be due to the increased number of years spent on education while men in older age groups may be affected by early retirement.

The Malays had increased their labour force by about 42 percent between the 1957 and 1970 Censuses while the increase for the Chinese was about 30 percent.@ In the 1957 - 80 period, the Malay share in

---

*In the 1957 Population Census, a person was considered employed if he had been gainfully employed for at least four months out of the preceding twelve months or if he had worked part-time on an average of at least three hours a day. A person was considered economically active if he or she had been in employment for less than four of the preceding twelve months but had been actively looking for work for at least six of the previous twelve months. In the 1970 Census, a person was considered employed if he or she had a regular business or helped in a family business or farm for an average of more than three hours per day during the reference week or, if the person worked for less than three hours per day during the reference week, had earned some money. A person was considered economically active if he or she was actively looking for work. Differences also exist in terms of classifications, procedures and dates of enumeration between the two censuses. For more details, see 1970 Population Census, I, Chap. 7. The 1980 Census also used a one week reference period. The figures for the 1970 Census and the 1980 Census are not directly comparable because the size of the labour force in the 1970 Census was under-estimated (1980 Census, 1983:110).

**No similar sub-classification are available at the time of writing for the 1980 Census.

@The estimates of the labour force size in the 1980 Census are not given because the figures for labour force size in the 1970 Census are under-estimated.

agriculture fell from about 74 percent to 67 percent while the Chinese share fell from 41 percent to about 20 percent. The share in agriculture by both Malay and Chinese males and females also declined between 1957 and 1970 (rf. Table 4.5). In all these groups, an increase was observed in manufacturing and services industries.

Table 4.5

Industry of the Experienced Labour Force for Population Aged 10 Years and Over by Community and Sex, 1957 and 1970

Industry	Males				Females			
	Malays		Chinese		Malays		Chinese	
	1957	1970	1957	1970	1957	1970	1957	1970
	(% Distribution)							
Agriculture	70.0	61.1	35.0	26.0	86.9	70.7	58.1	38.0
Mining and Quarrying	1.3	1.3	5.4	4.5	0.1	0.1	4.6	2.1
Manufacturing	2.3	4.7	14.6	17.6	3.5	6.0	7.2	14.4
Construction	2.9	1.3	5.0	5.7	0.0	0.0	2.0	1.2
Electricity, Gas, Water, Sanitary Services	0.5	1.0	0.5	0.5	0.0	0.1	0.1	0.1
Commerce	3.2	5.0	20.2	21.6	3.0	3.5	5.6	10.4
Transport, Storage, Communication	3.5	4.2	4.9	5.4	0.1	0.3	0.4	0.7
Services	15.0	18.3	12.4	14.1	5.6	10.0	20.6	25.3
Industry not adequately described	1.3	3.2	2.1	4.7	0.7	9.3	1.4	7.8
Total Experienced Labour Force	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: 1970 Population Census Report, I, Table 7.12

Jones (1980) noted that the increase of employment opportunities for women as a result of industrialisation was related to increasing age at first marriage. Mason (1978), using the 1974 Malaysian

Fertility and Family Survey (MFFS) data, did not find a strong impact of employment on fertility and family planning behaviour in Peninsular Malaysia. Tests of the hypothesis that employment was incompatible with child care because of the nature of the job or lack of baby-sitting help also proved to be insignificant.

Another factor that can significantly explain fertility behaviour is the perceptions parents have of the value of their children and of their roles within the family. The next section therefore looks at the value of children.

4.1.6. VALUE OF CHILDREN

The major evidence on value of children in Malaysia comes from Kee (1980). In this study, it was found that the security function of having children is less important to Chinese parents and children than to Malays or Indians. While Malay and Indian parents want sons for old age support, male descent is important to Chinese parents, essentially for the continuation of the family name. Malay parents, compared with Chinese and Indian parents, were found to value children most highly on various value dimensions and see children as least costly. Further, Malaysian teenagers desired a lower number of children than adults, tended to rate the emotive role of children above economic and old-age security roles and to place emphasis on the economic disadvantages of having children. If the views of the teenagers can be taken to indicate future expectation of children, fertility may decline but such views may change when they become adults as socio-economic conditions change.

It is still extremely common in Malaysia to find care of parents particularly in old age and provision of financial assistance to younger siblings for education and other members in times of illness or trouble (rf. Kee, 1980). From the 1974 MFFS, it was found that more than 70 percent of Malay women and 60 percent of Chinese women thought that children were just as willing as before to support them in old age. About 60 percent of Malay women and 50 percent of Chinese women thought that children were just as willing to give them part of their earnings. However, only 23 percent of Malay and 39 percent of Chinese women thought that they could rely a good deal on their children for financial support and 69 percent of Malay and 51 percent of Chinese women thought that they could rely on them a little. As regards the type of support expected in old age, it was found that more than 90 percent of both Chinese and Malay women mentioned help from children. The second most important type of support that was mentioned was savings or income from farm, business or other property (37 percent for Malays and 24 percent for Chinese). Overall, about 50 percent of the women mentioned help from children as the only means of support in old age. It is interesting to note that about 45 percent of Malays said they would live with their children when old and less than 10 percent said they would live with their children for the rest of their lives compared with less than 10 percent of Chinese women in the first category and 70 percent in the second category. This is true even by age groupings. Hence, the perception of the value of children both as economic investments and as providing emotional satisfaction indicates that the impact on fertility will be positive for some time to come.

Other factors which may affect fertility behaviour include the availability of modern contraception and the practice of breastfeeding. The next section therefore takes a look at what changes have occurred over this period and what differences exist in the knowledge and practice of modern contraception and breastfeeding.

4.1.7. CONTRACEPTIVE KNOWLEDGE AND PRACTICE

Prior to 1965, family planning and population education was provided mainly by voluntary organisations, namely State Family Planning Associations and the Federation of Family Planning Associations formed in 1958. The National Family Planning Board (NFPB) was created in 1966 and the NFPB service programme was created in May 1967. From the creation of the service programme until 1974, about 462,396 new family planning acceptors registered with NFPB, the Family Planning Associations and other participating agencies (Chander et al., 1977:16). The National Family Planning Board implemented its operational programme in four main phases:

Phase 1 - metropolitan areas (1967-68)

Phase 2 - smaller towns (1969)

Phase 3 - rural health centres (1970-73)

Phase 4 - rural areas and areas served by rural health centres (1973)

Under the national programme, in addition to mobile units, static clinics of the Board were established in General and District Hospitals, Maternity Hospitals, Main Health Centres, Health Sub-Centres, Federal Land Development Authority (FELDA), and Midwife Clinics-cum-Quarters. Family planning services were functionally

integrated into the rural health services of the Ministry of Health as part of the total package of family health after constraints, in terms of lack of trained personnel and facilities, adversely affected the expansion programme of the Board in the 1970s. Another form of integration was considered to implement the programme in FELDA. An arrangement was made whereby the midwives located in the FELDA schemes were trained by NFPB and they provided not only health services but also family planning services.

There are about 3,000 traditional birth attendants in Malaysia (TBA) and they were used as both recruiters of new acceptors and resupply agents in areas not accessible to the Board or any other servicing agencies. Family planning services were also made available to the estates either directly by NFPB or through Family Planning Associations or through the estates themselves. Some general practitioners also participated in the programme.

The laws on abortion (found in the Penal Code, Sections 312 to 316 and 511) permit induced termination of a pregnancy only to save or preserve the life of a mother. The 1966-67 West Malaysian Family Survey (MFS) revealed that about 1 percent of the women admitted to having had an induced abortion during their reproductive life. About 3 percent of the eligible respondents in the 1974 MFFS reported having had an induced abortion. Owing to the lack of data, the actual percentage of women who have experienced an induced abortion is unknown.

KNOWLEDGE OF FAMILY PLANNING METHODS

About 92 percent of the 6318 ever-married women interviewed in the 1974 MFFS reported knowledge of at least one method of contraception and almost all of them knew at least one of the 5 efficient methods.* About 88 percent reported that they had heard of the pill, followed by 73 percent who said they had heard of male or female sterilization. The percentage of women who had heard of the condom was 52 percent, IUD, 40 percent, rhythm, 38 percent, withdrawal, 30 percent, abstinence, 30 percent, and other female methods, 26 percent. About 1 in every 5 women interviewed had heard about folk methods.** If the sample is restricted to currently married women 15 to 44, the level of family planning knowledge increased from 44 percent in 1966-67 to 85 percent in 1970 and 92 percent in 1974.

Classification of the sample by age groups indicates that a higher percentage of those in the younger age cohorts have knowledge of at least one method of contraception compared with the older age cohorts. More Malays than Chinese have not heard of at least one method of contraception. The percentage of Malays in this category in the 1974 MFFS was 13 percent compared with about 2 percent of Chinese women.

---

*The efficient methods include pills, IUD, condom, sterilisation and other female methods (such as foam tablets, jelly, etc.).

**Folk methods to prevent pregnancy are commonly practised by women in Peninsular Malaysia. These various methods are discussed in Chander et al. (1977:130).

USE OF CONTRACEPTION

The 1974 MFFS reported that about 52 percent of the women interviewed had never used any method of contraception. Of the 48 percent who had used a method, 35 percent had used one of the five efficient methods; 2 percent had sterilisation as the first method and 11 percent had used an inefficient method. Of the efficient users (2,330 women), 85 percent had used the pill, 23 percent, condom, 14 percent, sterilisation, and 4 percent IUD. Of the inefficient methods (676), the most popular were rhythm (90 percent) and withdrawal (72 percent). The proportion of ever-users was considerably higher among those who did not want a future birth (63 percent) than those who wanted a future birth (44 percent) (1974 MFFS).

Overall, nearly two-thirds of Malay women had never used contraception compared with a third of Chinese women. This trend is also reflected in the percentage of current-users. About 55 percent of the Chinese women fall into this category compared with about 26 percent of the Malay women. Only about one percent of the Malay women were sterilised compared with six percent of Chinese women.

Over the years the proportion of currently married women who had ever used contraception has increased substantially. The 1966-67 MFS reported that only about 14 percent of women 15-44 had ever used contraception but in 1970 and 1974, this had increased to 27 percent and 53 percent, respectively (Chander et al., 1977:135). Women currently using contraception have also increased. The proportion of women in this category in 1966-67 was 9 percent, 16 percent in 1970 and 36 percent in 1974. The increase in the proportion currently

using contraception is also observed for all age groups (rf. Table 4.6).[6] The dramatic increase in the proportion practising contraception between 1966-67 and 1974 can be attributed largely to the widespread availability of family planning.

Table 4.6

Percentage of Currently Married Women Using Contraception by Age Groups

Race/Age Groups	1966-67	1970	1974
Total			
15-24	5.0	11.7	34.6
25-34	11.0	19.8	45.8
35-44	9.0	14.4	36.1
15-44	8.8	16.1	35.5
Malays			
15-24	3.3	-	27.4*
25-34	4.1	-	34.6
35-44	2.5	-	25.4
Chinese			
15-24	12.4	-	52.3
25-34	26.5	-	60.9
35-44	27.1	-	56.9

*The 1974 figures exclude pregnant women
- not available

Note: In 1966-67 the race refers to race of father and not of respondent. In most cases, the race of the respondent and her father should be the same unless she is adopted

Source: Chander et al., 1974:144,150
1966-67 MFS Report:289

PATTERN OF BREASTFEEDING

It is generally believed in many societies that lactation has contraceptive properties. It is therefore relevant to look at the patterns of breastfeeding. From the 1974 MFFS, it is found that in the last closed interval some 54 percent of the women breastfed for less than 6 months. The mean number of months of breastfeeding was 7 months. The percentage of women not breastfeeding remains about the same regardless of age but declines with increasing parity and with decreasing education and income. Malays have the lowest proportion not breastfeeding (7 percent) and among those breastfeeding, the average period of breastfeeding was the longest (8.9 months). Chinese women, on the other hand, breastfed their penultimate child on average for 4.4 months and as many as 41 percent of them did not breastfeed. The proportion not breastfeeding seems unreasonably high. Ferry (1981) has questioned the reliability of the Malaysian breastfeeding data.

Having looked at the changes that have taken place over this period, the next section attempts to assess the extent to which these changes affected individual birth cohorts.

4.2. CHANGES BY BIRTH COHORTS

The changes across birth cohorts cannot be precisely examined using the various data sources because of differences in definition and coverage. The changes are therefore inferred from the above discussion, with emphasis on Malay and Chinese women.

From the above discussion, it is quite clear that later birth cohorts compared with earlier birth cohorts are better off in terms of income and Chinese are relatively better off than Malays. Although the pace of urbanisation was quite slow over this period, it is likely that a greater proportion of the later (more recent) cohorts lived in the urban areas compared with the earlier birth cohorts. Further, it is likely that the Malays, due to the privileges available to them, have been more affected by urbanisation than the Chinese, partly because the Chinese were already more urbanised and therefore the pool of potential Chinese rural-urban migrants was much smaller. For the Malays too, infant mortality is higher than for the Chinese. Hence, Malays may have more children to compensate for their higher loss due to infant mortality. It is also probably correct to say that the experience of infant mortality is higher for earlier (particularly before mid-1950s) rather than later birth cohorts because infant mortality is declining over time. As a result of this, the effect on fertility may be different across birth cohorts.

The levels of education and literacy are also improving and this means that later birth cohorts have higher levels of education and literacy (rf. Appendix 4.1 and Appendix 4.2). A greater proportion of Chinese compared with Malay women were literate or educated in 1957 (1957 Population Census, Tables 8 and 9). Over time, particularly in the younger birth cohorts, the proportion of educated or literate Malays has become similar to, if not higher than the Chinese (rf. Table 4.7 and Appendix 4.2). For example, in 1957, about 23 percent of Malay men aged 15-19 years (those born in 1938-1942) had more than 6 years of education compared with 9 percent of men aged 40-44 years (those born in 1913 - 1917). Thirty-two percent and 20

percent of Chinese men had more than 6 years of education in the respective two age groups in 1957. In 1970, 53 percent of Malay men and 58 percent of Chinese men aged 15-19 years (those born in 1955 - 1959) had 7 years of education or more. In 1957, 8 percent of Malay women aged 15-19 years had more than 6 years of education compared with 17 percent of Chinese women. In the 40-44 age-group only 0.2 percent of Malay women and 4.1 percent of Chinese women had 7 years of

Table 4.7

Percentage of Malay and Chinese Women Over Age 25 Years* With No Education or Illiterate, 1974 MFFS

Age Groups	No Education		Illiterate	
	Malays	Chinese	Malays	Chinese
25-29	18.3	17.1	22.0	24.0
30-34	35.3	25.5	36.7	33.6
35-39	49.4	36.0	50.5	45.0
40-44	65.9	51.6	65.5	56.3
45-49	71.8	52.7	70.6	57.3

*At age 25 years, most of the women would have completed their education

education or more. The figures from 1970 Census indicate that about 37 percent and 44 percent of Malay and Chinese women aged 15-19 years had more than 7 years of education.

As regards labour force participation, both men and women are becoming less likely to be working in agriculture and more likely to be working in manufacturing and services. There is also some indication that women are increasingly involved in work outside the

home. However, as the definitions differ across data sources and the number participating in the work force increases or decreases depending on the stage in the women's life, such as when children are grown-up or young, no further comparisons are possible.

Malays as well as Chinese women perceive children as economic investments, although, according to Kee (1980), the security function of having children is less important to Chinese parents. This perception of children seems not to have diminished over time and is likely to positively affect fertility for some time. On the other hand, knowledge and use of contraception are increasing over time. Younger birth cohorts have more knowledge and greater use of contraception, particularly after the introduction of the national family planning services in 1967. A greater proportion of Chinese compared to Malay women have knowledge of or use contraception. As regards patterns of breastfeeding, a smaller proportion of Malays compared with the Chinese do not breastfeed and the period of breastfeeding for Malay women who breastfeed tends to be longer than for the Chinese women. There is evidence that the practice of breastfeeding is declining.[7]

To summarise, recent cohorts compared with earlier cohorts have higher income, higher education and literacy level, lower infant mortality, tend to participate in the modern sector of the work force, have higher knowledge and use of contraception, tend to be more urbanised, breastfeed for shorter periods but do not seem to value their children less. Most of the above changes affect fertility negatively and therefore the fertility of more recent cohorts of women can be expected to be less than for earlier cohorts, unless other factors, such as cultural change

and perception of children act in an opposing direction. Also, some 'modern' factors, such as improved nutrition (fecundity), the decline in widowhood and divorce, and the rise of romantic marriages (rf. Rindfuss and Morgan, 1983) may increase the 'supply' of fertility.

Malay women compared with Chinese women tend to receive less income, are less urbanised (although the rate of urbanisation has recently been higher for the Malays than the Chinese), more likely to be working in agriculture, have higher infant mortality, tend to have less knowledge and use of contraception, tend to practise breastfeeding and for longer periods of time, and are less educated and literate. The Malays, however, seem to have reached comparable levels of education with the Chinese women in the 1980s. With the exception of education, all the above factors, including the high value they place on having children, should make for higher Malay fertility than Chinese fertility. This pattern seems to be indicated, particularly by more recent cohorts.

This chapter has attempted to evaluate what changes have taken place in the socioeconomic factors, commonly known to affect demographic behaviour, with reference to cohorts. The limitation is that the data sources available do not allow more specific assessment of the significance of the various factors for the demographic behaviour of the various cohorts.

Appendix 4.1

Proportion Literate of Malay and Chinese Males and Females by Age Groups in the 1970 Population Census

	Males		Females	
Age-Groups	Malays	Chinese	Malays	Chinese
10-14	79	63	75	60
15-19	88	83	81	75
20-24	88	82	75	67
25-29	83	80	58	55
30-34	77	76	41	44
35-39	70	69	28	31
40-44	67	67	22	26
45-49	60	68	15	22
50-54	53	63	9	16
55-59	48	57	6	10
60-64	39	47	4	7
All ages 10+	73	70	51	47
All ages 15+	72	71	45	44

Source: 1970 Population Census Report, II, Table 4.13

Appendix 4.2

Percentage Distribution of Malay and Chinese Male and Female by Educational Level (in years) by Age Groups, 1957 and 1970 Population Census

Age Group	Males						Females					
	Malays			Chinese			Malays			Chinese		
	0	1-6	7+	0	1-6	7+	0	1-6	7+	0	1-6	7+
1957												
15-19	15	63	23	8	60	32	47	45	8	30	53	17
20-24	24	62	14	12	65	23	65	32	3	46	43	11
25-29	30	61	9	16	66	18	74	25	1	58	35	7
30-34	35	55	10	15	61	24	82	18	1	63	29	8
35-39	41	50	10	17	58	25	88	12	1	71	22	7
40-44	45	46	9	22	58	20	93	7	0	80	15	4
45-49	51	42	7	28	56	16	95	5	0	87	10	3
50-54	59	36	5	35	52	13	97	3	0	91	7	2
55-59	63	33	4	39	49	11	97	3	0	94	5	1
60-64	69	28	3	44	46	10	98	2	0	96	4	1
1970												
15-19	6	42	53	3	38	58	12	51	37	9	47	44
20-24	8	60	33	5	52	43	19	63	18	17	54	29
25-29	12	67	22	7	59	34	34	58	9	27	52	21
30-34	18	68	14	9	64	27	52	44	4	38	49	13
35-39	25	66	10	15	67	18	66	33	2	54	39	8
40-44	29	66	6	18	68	15	73	26	1	61	34	6
45-49	37	58	5	19	64	18	82	18	1	67	27	6
50-54	43	52	5	25	62	14	88	11	0	76	20	4
55-59	48	48	4	31	59	10	92	8	0	84	14	2
60-64	57	41	3	40	53	7	95	5	0	89	10	2

Source: Calculated from figures presented in 1957 Population Report, Table 8 and 1970 Population Report, II, Table 4.10

Appendix 4.3

Labour Force Participation Rates of Malays and Chinese by Age Groups and Sex, 1957 and 1970 Census

Age Group	Males				Females			
	Malays		Chinese		Malays		Chinese	
	1957	1970	1957	1970	1957	1970	1957	1970
10-14	10.4	9.1	8.2	9.3	5.1	7.2	8.6	8.5
15-19	62.8	53.0	54.6	53.6	20.0	28.8	34.5	39.9
20-24	93.7	86.0	90.2	88.9	24.9	35.8	35.1	51.3
25-29	97.5	92.4	97.1	94.9	26.4	37.3	24.0	39.4
30-34	98.0	93.3	97.4	95.5	31.0	39.9	22.9	36.1
35-39	97.8	93.4	97.3	95.1	34.1	42.3	26.6	34.2
40-44	97.1	92.5	97.0	94.0	35.5	44.7	29.7	31.4
45-49	95.8	91.0	96.4	92.3	36.5	47.0	32.7	29.0
50-54	93.1	87.5	94.2	85.7	34.6	44.0	31.2	26.1
55-59	87.6	79.1	90.3	75.7	31.0	38.4	26.9	21.0
60-64	83.2	71.7	81.1	63.3	25.6	30.9	18.4	16.7
Total								
10+	75.3	66.2	71.0	65.6	24.1	31.1	24.9	29.9
15+	89.5	81.4	86.2	81.7	28.3	37.6	29.6	36.6

Source: Table 7.2, 1970 Population Report, I

ADDITIONAL NOTES (CHAPTER 4)

Page numbers in brackets at the end of each note refer to the relevant page in the text of the thesis.

Note 1 : Figures from the Malaysian Economic Plans were quoted because they were, in many instances, the only figures available for 1980, at the time of writing. (p. 113)

Note 2 : Malaysian vital registration statistics are published by both place of occurrence and place of residence (this is true even for very recent publications). The statistics by place of occurrence were used throughout the thesis. (p. 118)

Note 3 : The tables in the appendix have limited value in interpreting trends as only figures for 1970 (and 1957) are available. In particular, the figures for Appendix 4.3 cannot be analysed further because of differences in definition (this has been explained on p. 127). (pp. 141-3)

Note 4 : Both education and literacy were used because the education system has changed greatly over the period of study. It is true that there would be a high correlation between the two variables. It is, however, believed that amongst older men and women, where quite a large proportion did not have formal education (rf. Appendix 4.2), the use of the variable, literacy, provides extra information. (pp. 123-126)

Note 5 : The paper referred to as Mason (1978) on p. 128 seems to contain the preliminary results of the study published as Mason and Palan (1981), 'Female Employment and Fertility in Peninsular Malaysia: The Maternal Role Incompatibility Hypotheses Reconsidered', DEMOGRAPHY, 18(4):549-575. In this later paper, the lack of consistent evidence, as well as conceptual problems, led them to propose an alternative framework for understanding variation in the employment-fertility relationship. (pp. 128-129)

Note 6 : The observation on pp. 137-40 that later cohorts are better off in terms of income than earlier cohorts is probably correct. It is true that if per capita income is increasing, such an observation is only correct if income distribution remains constant or the income distribution changes in favour of younger cohorts. If income distribution can be assumed to be constant by age groups in any year, then any increase in income will mean that at the same age, later cohorts (in their childbearing years) are better off than earlier cohorts. If income distribution is changing, the changes is probably in favour of later cohorts because a greater proportion of later cohorts have higher level of education. In Malaysia, a person with a higher education can get a better paid job. On average, therefore, later cohorts will be better off than earlier cohorts in terms of income. Income data are not usually presented by age groups.

> Over the period of study, the Malays are definitely more affected by urbanisation than the Chinese based on two main reasons. Firstly, as stated on p. 117, the Malays have the priviledged position of jobs in the government sector as well as commercial companies, mostly in large towns. Push factors, such as the lack of economic, educational, medical and entertainment facilities, assisted in rural-urban mobility, bearing in mind that the Malays formed the majority of the rural population. Secondly, as explained on p. 137, the Chinese were already more urbanised and so the pool of potential Chinese rural-urban migrants would be much smaller. The figures presented on pp. 116-118 illustrates that the Malays were more affected by urbanisation than the Chinese.
>
> (p. 137)

[1] Zainudin and Zulkifly (1982:142-144), reviewing the studies available at the beginning of 1980, found a worsening situation from 1958 to 1968, followed by an improvement in 1970 and a further improvement in 1973. The income differentials between the rural and urban populations, and between the Malays and the Chinese, also worsened in the 1960s compared with the 1950s but seems to have improved in the early 1970s. However, later figures provided in the Fourth Malaysia Plan (1981:56), based on various surveys, indicate, at most, only a very slight lessening in the differential in income distribution between the rural and urban areas and the Malay and the Chinese populations in 1979 compared with figures in the early 1970s.

It is relevant to point out that income data are of questionable quality. The errors of measurement in income lie not only with the respondents, but also with the specification of income in the questionnaire. More often than not, income is not rigidly defined and what results is an income figure which may include borrowings or gifts and exclude income from property and from other members of the household. It normally happens that the income of the head of household only is given and the income from the rest of the household is ignored (rf. Tan, 1978:75). For example, evidence of under-reporting of income was found for the 1973-74 Household Expenditure Survey (Tan, 1978:135).

Kuznets (1955) observed taht the dynamics of income distributional changes are to be found (i) in the increased importance of non-agricultural employment where earnings are more unequally distributed, and (ii) in the increasing inequality of earnings within the non-agricultural sector. For Malaysia as a whole (that is Peninsular Malaysia and East Malaysia), the share of total employment in agriculture has declined while the value added per worker increased much more rapidly in sectors, such as the manufacturing, than in the agricultural sector (rf. Fourth Malaysia Plan:81,85). Also, according to Oshima (1975:10-11), one of the three factors responsible for the reduction of inequality in the West, that is the share of property and proprietors' income, is not likely to fall in South East Asia for some time to come. If the Japanese experience is any indication, the second factor, the fall in the size of the proprietor class can be expected not to take place in the near future. The third factor, the narrowing of product per worker differentials among the three major sectors, agriculture, industry, service, did not follow that of the West. A significant widening occurred, and this is found to be true

of the experience of Japan, Taiwan and South Korea in postwar decades. Thus, inequality in income distribution exists, and the situation has probably not improved in the 1970s compared with the late 1960s. The evidence available indicate that the situation in the 1960s was worse than in the 1950s.
It is difficult to sort out the effect of changes in income distribution from changes in income and the effect of urbanisation as they are closely related. One would expect movement from rural to urban areas and changes in absolute income to have much more effect on nuptiality and fertility behaviour than changes in relative income.
The data sources available do not allow one to be more specific than is the case in this and subsequent sections. Without specific information and rigid statistical tests, it is assumed that all the factors discussed do have some effects, either alone, or together with other factors, in affecting demographic change. (pp. 112-6)

[2]As is subsequently noted in this section, the figures have to be treated with caution because changes in urban boundaries have occurred (rf. 1980 Census, 1983:20) and out-migration has caused certain areas to cease being classified as urban (rf. Sidhu and Jones, 1981:10). Nevertheless, the evidence subsequently presented indicate that both urbanisation and distributional changes are important in explaining demographic change, particularly of the Malays. (p. 116)

[3]This section dealing with trends in mortality does not go into the causes of mortality decline because it is beyond the scope of this thesis. The relevance of this section, as stated in the second paragraph of p. 118, is the relationship between fertility and mortality decline. The aim of this section is to present figures indicating that mortality has in fact declined and this may be important in explaining fertility trends.
Without examining detailed figures and carrying out further analyses, the decline in mortality was no doubt a result of rising levels of living, and improvements in medical facilities and personnel and public health services. Public health services included environmental sanitation (provision of safe water supply and sanitary latrines), applied nutrition services and, control and eradication of communicable diseases such as malaria, tuberculosis, leprosy, yaws and filariasis. (pp. 118-21)

[4]The main medium of instruction refers to main language of instruction. (p. 122)

[5]The key division here is not home versus work but work within family circle versus work outside the family circle. (p. 122)

[6]Corresponding figures for the Percentage of Currently Married Women Ever Using Contraception for 1966-67 and 1974 are presented in the table below. (p. 135)

Race / Age Groups	1966-67	1974
Total		
15-24	14.1	42.0
25-34	16.3	59.7
35-44	10.3	52.7
15-44	14.0	53.3
Malays		
15-24	8.3	32.8
25-34	7.2	46.3
35-44	7.2	36.9
Chinese		
15-24	16.9	62.8
25-34	37.4	75.5
35-44	34.2	72.2

[7] DaVanzo and Haaga (1982), using data from the 1976-77 Malaysian Family Life Survey (MFLS), found that breastfeeding duration has declined over time and particularly for the Chinese and Indians. It is stated that biases in reporting exist and this may exaggerate the ethnic differences and trends over time towards shorter breastfeeding (DaVanzo and Haaga, 1982:375). (p. 139)

CHAPTER 5

EXPLAINING NUPTIALITY BEHAVIOUR

This chapter examines the differences in nuptiality behaviour between the various cohorts of Malay and Chinese women and searches for explanation of these differences. The first section looks at the overall cohort differences in nuptiality patterns. The Coale-McNeil nuptiality model schedule is fitted where data permit to explain the changes in the tempo and timing of marriage. With the cohort frame in mind, the second section focuses on age at first marriage and its determinants. A search for possible determinants of age at first marriage is carried out by looking at differentials in age at first marriage using background variables such as childhood residence, education and work status before marriage. AID3 is used to assist in the search for a model of age at first marriage. Using AID3 this can be done in two ways, (1) make a correct assessment of the structure of the model, and (2) locate interactions among the predictors. Finally, various multivariate techniques, such as multiple classification analysis and analysis of variance, are used to estimate the effects of these selected variables on age at marriage patterns. In the third section, the same process as described in Section 2 is repeated using probability of divorce as the dependent variable.

5.1. COHORT DIFFERENCES IN NUPTIALITY PATTERNS

5.1.1. OVERALL DIFFERENCES

As observed in Chapter 2, age at first marriage has been rising. This rising trend is observed in the mean age at first marriage of both birth and marriage cohorts using the 1974 MFFS data (rf. Table 5.1). The earlier cohorts, both marriage and birth cohorts, married earlier than later cohorts. By either marriage or birth cohorts, the Chinese, on average, married later than the Malays. For both the Malay and Chinese birth cohorts, the increase in average age at marriage for the five cohorts shown was about 2 years. The Malays born in 1925-29 married, on average, at 16 years while those born in 1945-49 married on average at 18 years. On the other hand, the Chinese from the 1925-29 birth cohort married on average at 19 years while those from the 1945-49 birth cohort married at around 21 years. For marriage cohorts, the Malays who married in 1950-54 married at around 16 years while the corresponding age was around 22 years for those who married recently. The increase was about 6 years. For the Chinese, however, those who married recently did so at around 23 years while those who married in 1950-54 did so at around 20 years, an increase of only about 3 years. The mean ages at marriage of the 1970-74 Malay and Chinese marriage cohorts were more or less similar: thus it appears that in the early 1970s the Malay age at marriage had

increased to the same high level as the Chinese.* If the mean age at marriage figures are calculated for women aged 30 years and over who married before age 30 (figures in parentheses in Table 5.1) a rising trend in age at first marriage is again observed. The large difference between these figures and the figures obtained earlier for women married before the age of 25 years, particularly for the young marriage cohorts, is a result of the age at marriage bias and the heavy influence of younger birth cohorts in marriage cohorts obtained from survey data. The interesting question is whether the Malay marriage pattern has been influenced by the Chinese marriage pattern in the less predominantly Malay areas and whether the Chinese marriage pattern tends to follow the Malay pattern in the predominantly Malay areas. To test this hypothesis, the eleven states in Peninsular Malaysia were divided into two groups, that is, State Group 1 and State Group 2. State Group 1 includes states where more than 50

---

*The trend in age at marriage is sharper across marriage cohorts than across birth cohorts. The results are in fact not directly comparable. The number of marriages occurring in a period (and constituting a real marriage cohort) have an age distribution that is dependent on the relative sizes of the birth cohorts marrying in that period. In a growing population, such as Malaysia, more recent marriage cohorts will have younger age distributions as population growth is associated with increasing size of birth cohorts. If younger birth cohorts are postponing marriage because of higher level of education and greater employment opportunities, this will inflate the values of age at marriage of recent marriage cohorts. Further, these marriage cohorts have an age at marriage bias. Women who have been married for long periods of time would have to be married at very young ages because of the upper age limit of the survey. For example, a woman aged 49 years and married for 24 years had to be married by the age of 25 years, otherwise she would not be included. Also, for a particular marriage duration, women of different ages at interview would have to be married by different ages. For example, to be married for 20 years, a woman aged 40 would have to have been married by 20 years while a woman aged 41 would have to have been married by 21 years and so on to be included in the survey.

percent of the population were Malays in 1974 and State Group 2 includes states which had less than 50 percent Malays. Based on the figures from the 1974 Vital Statistics, the states were grouped into Johore, Kedah, Kelantan, Pahang, Perlis and Trengganu forming State Group 1 and Malacca, Negri Sembilan, Penang, Perak and Selangor

Table 5.1

Mean Age at First Marriage for Women Aged 25 Years and Over who Married before Age 25 Years[@] by Race for Various Birth Cohorts and Marriage Cohorts, 1974 MFFS

	Race	
	Malays	Chinese
Birth Cohorts		
1945-49	17.9 (n. app.)	21.0 (n. app.)
1940-44	17.1 (17.6)	20.5 (21.8)
1935-39	16.6 (17.0)	19.6 (21.1)
1930-34	16.1 (16.5)	19.3 (20.3)
1925-29	15.7 (15.9)	18.8 (19.3)
Marriage Cohorts		
1970-74	22.5 (*)	22.9 (*)
1965-69	19.7 (24.3)	21.3 (24.8)
1960-64	17.7 (20.1)	20.4 (22.1)
1955-59**	16.7 (17.2)	19.6 (20.3)
1950-54**	16.3 (16.4)	19.2 (19.6)

[@] To correct for truncation bias, the values were computed for this sample of women

( ) Figures in parentheses indicate the mean age at first marriage of women aged 30 years and over who married before age 30 years

n. app. not applicable

*, ** less than 30 cases

Women who married before 1950 are excluded because of censoring bias. Women who married before this date had to marry at younger ages because of the upper age limit of the survey

forming State Group 2.* More explicitly, the hypothesis to be tested is whether the Chinese in State Group 1 (predominantly Malays) are influenced by the Malay early marriage pattern and tend to marry more times, and whether the Malays in State Group 2 (predominantly non-Malays among whom Chinese predominate) are influenced by the Chinese pattern of later marriage and marry fewer times.

From Table 5.2, it can be seen that using birth cohorts, the Malays in State Group 1 tend to marry earlier than the Malays in State Group 2.** The Chinese in State Group 1 also generally married earlier than those in State Group 2. The difference in the mean age at marriage between State Group 1 and State Group 2 is however not great for either the Malays or Chinese and the Malays still maintained the pattern of early marriage compared with the Chinese.

By marriage cohorts, the Chinese and Malays in State Group 1 married earlier than those in State Group 2, except for the Malay marriage cohort of 1970-74 and the Chinese marriage cohort of 1960-64, probably a result of sampling error. The differences in the mean ages at marriage of women in State Group 1 and State Group 2 are however

---

*Malacca had in fact 52 percent Malay population. As this proportion is lower than the proportion of the Malays in the other states in State Group 1 and there are only four states in State Group 2 (if Malacca is not included), it was decided that Malacca should be added to State Group 2.

**If State Group 1 is defined as states with more than 70 percent Malays (that is Kedah, Kelantan, Trengganu and Pahang) and State Group 2 as the other states, the results remain basically the same, with marginally lower mean age at marriage for the Malays in State Group 1.

Table 5.2

Mean Age at First Marriage for Women Aged 25 Years who Married before Age 25 Years by Race by State** by Birth and Marriage Cohorts, 1974 MFFS

Race/State Type/ Residence	Birth Cohorts 1945-49	1940-44	1935-39	1930-34	1925-29
State Type					
Malays					
State Group 1	17.6	16.8	15.9	15.9	15.6
State Group 2	18.4	17.6	17.4	16.3	15.8
Chinese					
State Group 1	21.0	20.3	19.3	19.2	18.1
state Group 2	21.0	20.6	19.7	19.3	19.1
Present Residence					
Malays					
Metropolitan or Small Town	19.3	17.8	17.4	16.4	15.4
Rural	17.6	16.9	16.4	16.0	15.7
Chinese					
Metropolitan or Small Town	21.1	20.8	19.6	19.4	18.9
Rural	20.8	20.2	19.6	19.1	18.6

	Marriage Cohorts 1970-74	1965-69	1960-64	1955-59	1950-54
State Type					
Malays					
State Group 1	22.6	19.4	17.4	16.2	15.8
State Group 2	22.4	20.1	18.1	17.4	16.8
Chinese					
State Group 1	22.7	21.1	20.7	19.5	18.3
State Group 2	22.9	21.4	20.3	19.6	19.5
Present Residence					
Malays					
Metropolitan or Small Town	*	20.1	18.7	17.8	16.7
Rural	22.5	19.6	17.5	16.4	16.2
Chinese					
Metropolitan or Small Town	23.0	21.4	20.8	19.7	19.4
Rural	22.8	21.1	20.1	19.5	18.8

** See definition in the text.
*less than 30 cases

not great. One can only say at this point that the influence of the marriage pattern of the predominant group has a minimal effect on the minor or smaller group. This is further confirmed by testing the hypothesis using place of residence instead of states. The Chinese form the predominant group in metropolitan or town areas but in the rural areas the Malays are predominant. For the various Malay and Chinese birth or marriage cohorts, regardless of the place of residence, the Chinese married later than the Malays. Although the Malays and Chinese in the metropolitan and town areas married later than their counterparts in the rural areas, except for the 1925-29 Malay birth cohort (probably attributable to sampling error), the difference in the mean age at marriage for either the Malays or the Chinese between the two areas of residence is not great. The Chinese women compared with the Malay women maintained their later marriage pattern. The hypothesis is next tested using the variable, the mean number of times married.

The number of cases of Chinese who had married more than once is so small that variation across categories is negligible. The mean number of times married is therefore calculated for the Malay group only. It can be seen from Table 5.3 that the Malays in State Group 1 (predominantly Malays) generally marry more times than those in State

Table 5.3

Mean Number of Times Married for Ever-married Malay Women Aged 25 Years who Married** before Age 25 years by Age at Marriage by State by Birth Cohorts, 1974 MFFS

Age at Marriage/State Type/ Residence	Birth Cohorts 1945-49	1940-44	1935-39	1930-34	1925-29
State Type					
Less than 17					
State Group 1	1.4	1.4	1.6	1.9	1.9
State Group 2	1.1	1.2	1.3	1.4	1.6
17 - 18					
State Group 1	1.1	1.3	1.4	1.4	1.8
State Group 2	1.0	1.1	1.1	1.1	1.2
19 - 20					
State Group 1	1.2	1.2	*	*	*
State Group 2	1.0	*	*	*	*
Residence					
Less than 17					
Metropolitan or Small Town	*	*	1.2	1.6	1.8
Rural	1.3	1.3	1.5	1.6	1.8
17 - 18					
Metropolitan or Small Town	*	*	*	*	*
Rural	1.1	1.2	1.3	1.3	1.6
19 - 20					
Metropolitan or Small Town	*	*	*	*	*
Rural	1.1	1.1	1.3	1.2	1.3

** See text for definition

*less than 30 cases

Group 2.* Also, women married at younger ages tend to marry more times. The number of Malays in the metropolitan or small town areas, which was already small, was further reduced by women not stating the number of times they were married. Thus, many of the mean values for the Malays in the metropolitan or small town areas (rf. Table 5.3) were not calculated. The available values for the rural areas indicate that the mean number of times married was higher the younger the age at marriage. The evidence seems to lend some support to the hypothesis that the pattern of remarriage of the predominant group has some influence on the pattern of remarriage of the smaller group. The pattern of higher remarriage can be a result of a higher probability of marriage dissolution due to widowhood or divorce. If the pattern of marriage is caused by a higher probability of divorce, then it is clearly more likely that the predominant group can have some influence over the remarriage pattern of the smaller group. Table 5.4 indicates that the probability of divorce for the Malays was higher in the rural areas and in State Group 1 (predominantly Malays). Hence, there seems to be some evidence to support the above hypothesis, but this influence, if it exists, is not expected to be great. This is because the more predominantly Malay areas are less developed areas and other factors such as lower education and literacy level may have been responsible for the higher rate of remarriage.

---

*Re-definition of State Group 1 to include states with more than 70 percent of Malay population also does not alter the results very much, except by raising marginally the values of the mean number of times married of women in this group. It is relevant to point out that (using this definition) about 28 percent of Malay marriages in State Group 1 had been dissolved by divorce compared with 11-13 percent in other states. The proportion of Chinese first marriages ending in divorce was about 3 percent in State Group 1, one percent higher than in other states.

Table 5.4

Percentage Distribution of Malay Ever-married Women Whose First Marriages were Dissolved by Years since First Marriage by State Type and Place of Residence, 1974 MFFS

State Type or Residence /Years since First Marriage	First Marriage Undissolved	First Marriage Dissolved by Husband's Death	Divorce
1. Residence			
Metropolitan or Small Town	74.0	8.2	17.8
less than 5	*	*	*
5-9	90.7	0.0	9.3
10-14	77.8	1.6	20.6
15-19	78.4	5.7	15.9
20+	63.8	14.4	21.8
Rural	67.1	8.9	24.1
less than 5	84.2	0.0	15.8
5-9	85.6	2.3	12.2
10-14	77.9	3.4	18.6
15-19	75.2	3.0	21.8
20+	55.9	14.6	29.5
2. State Type			
State Group 1	63.2	8.2	28.6
less than 5	82.2	0.0	17.8
5-9	84.5	0.6	14.9
10-14	74.2	2.8	23.0
15-19	69.6	3.2	27.2
20+	51.5	13.9	34.6
State Group 2	75.3	9.7	15.1
less than 5	91.2	2.9	5.9
5-9	89.6	3.5	7.0
10-14	83.7	3.8	12.5
15-19	84.2	3.8	12.0
20+	65.0	15.6	19.4

*mean not calculated because less than 30 cases

Note: Fluctuation in values can be attributed not only to sampling error but also to biases from censoring and truncation, which have not been controlled, as the main purpose of the table is to present a general picture.

The above estimates of the mean age at marriage do not cover the marriage experience of the two younger birth cohorts of 1950-54 and 1955-59. The truncation of the age at marriage at 25 years also gives an incomplete description of the patterns of marriage of the older cohorts.* Hence, the Coale-McNeil model (Coale and McNeil, 1972; Rodriguez and Trussell, 1980) to estimate the mean age at marriage is used. This model can also be used to predict the future course of marriage in cohorts that are still young. However, the true upward trend of μ , the mean age at marriage across cohorts, is likely to be overstated wherever heaping on current age is prevalent. As age heaping is more likely to occur among low SES-respondents who tend to marry early, this will result in underestimates of μ , particularly for older cohorts. The results obtained from application of this model to the 1974 MFFS data are presented in the next section.

5.1.2. AGE AT MARRIAGE MODEL (COALE-MCNEIL NUPTIALITY MODEL SCHEDULE)

The model was fitted to the individual data of total ever-married women. Table 5.5 presents the results obtained for five-year birth cohorts from 1925-29 to 1950-54. The birth cohort of 1955-59 was left out because both the algorithms, the Davidon-Fletcher Powell (DFP) method and GRADX (Goldfeld and Quandt, 1972), failed to converge. Generally, the model seems to fit the data well, but the fit of the model is particularly poor for those born before 1935. This may be the

---

*The truncated experience is however quite small. Only 9.5 percent of the sample married at 25 years and over.

Table 5.5

Estimates of the Parameters of the Coale-McNeil Nuptiality Model fitted to Grouped Marriage Data from the Malaysian Individual Survey, 1974 MFFS

Birth Cohorts	$\hat{\mu}$	$\hat{\sigma}$	a_0	k	p values fit	p values homogeneity
Total						
1950-54	24.1	6.7	12.4	1.025	0.167	0.298
	(0.63)	(0.44)	(0.20)	(0.07)		
1945-49	22.7	6.7	11.2	1.017	0.179	0.254
	(0.33)	(0.27)	(0.21)	(0.04)		
1940-44	20.8	5.7	11.0	0.860	0.276	0.452
	(0.21)	(0.18)	(0.18)	(0.03)		
1935-39	19.4	5.1	10.7	0.771	0.020	0.055
	(0.16)	(0.13)	(0.15)	(0.02)		
1930-34	19.2	4.9	10.7	0.751	0.002	0.062
	(0.17)	(0.14)	(0.17)	(0.02)		
1925-29	18.3	4.8	10.1	0.725	0.008	0.053
	(0.17)	(0.14)	(0.17)	(0.02)		
Chinese						
1950-54	26.4	6.8	14.7	0.642	0.155	0.239
	(1.83)	(1.16)	(0.38)	(0.06)		
1945-49	26.1	6.1	15.5	0.763	0.368	0.632
	(0.67)	(0.50)	(0.31)	(0.04)		
1940-44	24.3	5.3	15.2	0.716	0.435	0.614
	(0.34)	(0.29)	(0.28)	(0.03)		
1935-39	23.8	5.8	13.9	0.817	0.435	0.778
	(0.34)	(0.29)	(0.31)	(0.04)		
1930-34	22.6	4.7	14.4	0.670	0.421	0.811
	(0.27)	(0.23)	(0.27)	(0.03)		
1925-29	21.5	4.3	14.1	0.615	0.807	0.738
	(0.26)	(0.22)	(0.26)	(0.03)		
Malays						
1950-54	22.0	5.6	12.3	0.853	0.411	0.313
	(0.61)	(0.45)	(0.24)	(0.07)		
1945-49	20.1	5.3	11.0	0.800	0.128	0.150
	(0.29)	(0.25)	(0.22)	(0.04)		
1940-44	18.5	4.4	10.9	0.664	0.040	0.009
	(0.20)	(0.17)	(0.19)	(0.03)		
1935-39	17.7	4.0	10.8	0.610	0.126	0.219
	(0.16)	(0.13)	(0.16)	(0.02)		
1930-34	17.4	4.0	10.6	0.605	0.001	0.321
	(0.18)	(0.15)	(0.18)	(0.02)		
1925-29	16.7	4.0	9.8	0.615	0.119	0.285
	(0.20)	(0.17)	(0.21)	(0.03)		

Note: Figures in brackets are standard errors.

result of misreporting of ages or there may be some postponement of marriages in the war years or the model simply may not adequately represent the experience of these cohorts. As the estimated mean age at marriage seems reasonable for almost all groups, one would conclude that it is unlikely that the method is unsuitable.

The results obtained also indicate that the mean age at marriage is rising. If the results for the Malay and Chinese women are looked at separately, an increasing trend in the age at marriage is also observed. Ignoring the results of the two youngest cohorts because of large standard errors, and therefore unstable mean values, it is found that the mean age at marriage of the 1925-29 Chinese birth cohort was 22 years but for the 1940-44 birth cohort, the mean age at marriage was 24 years. For the Malays, the fits for the 1940-44 and the 1930-34 birth cohorts are poor and the test of homogeneity for the 1940-44 birth cohort indicates that the age at marriage of women in this group is not homogeneous at the 0.01 level. If the result of the youngest birth cohort of 1950-54 is ignored because of large standard errors, the mean age at marriage ranges from 17 years for the oldest cohort to 20 years for the 1945-49 birth cohort.

Comparing the values for the Malays and Chinese women, ignoring the 1950-54 birth cohort because of large standard errors, particularly for the Chinese, it is clearly seen that for all birth cohorts not only did the Malay women marry earlier than the Chinese, but they also married over a narrower range of ages. For both the Malays and Chinese, the range of age at marriage was larger for the

younger than the older cohorts. For example, the estimated standard deviation for the Malays was 4.0 for the 1925-29 birth cohort but it was 5.3 for the 1945-49 birth cohort. The rate of marriage relative to the Swedish standard, as indicated by the value of k, indicates that the pace of marriage was slightly slower for the Malays than for the Chinese. This means that for the same proportion of those women who would ever marry to marry by a certain age, the Malays took a slightly longer time than the Chinese. However, generally, the Chinese started marriage later than the Malays, as indicated by a_0.

The estimates of the mean age at marriage using the above model are higher than the earlier estimates (rf. Table 5.1). This is to be expected since the former estimates were calculated for the sample of women who married before age 25 years. If both sets of estimates are correct, the difference between the two sets of values indicates that a greater proportion of women in the younger cohorts tend to marry after age 25 years compared with those in the older cohorts. This is likely to be true since women in the younger cohorts are more highly educated and tend to be in the labour force, as observed in Chap. 4.

The model schedule was next fitted simultaneously to both household and individual data of Malay and Chinese women and the results in Table 5.6 were obtained. The results are generally the same as those in Table 5.5, except

Table 5.6

Estimates of the Parameters of Coale-McNeil Nuptiality Model Fitted to Grouped Marriage Data from Both the Household and Individual Surveys, 1974 MFFS

Birth Cohorts	$\hat{\mu}$	$\hat{\sigma}$	$\hat{c}$	p values fit	p values homogeneity
Malays					
1950-54	22.1	5.7	0.998	0.410	0.313
	(0.55)	(0.42)	(0.07)		
1945-49	20.1	5.2	0.939	0.128	0.150
	(0.28)	(0.24)	(0.02)		
1940-44	18.5	4.4	0.962	0.040	0.009
	(0.20)	(0.18)	(0.01)		
1935-39	17.7	4.0	0.981	0.126	0.219
	(0.16)	(0.13)	(0.01)		
1930-34	17.4	4.0	0.992	0.001	0.321
	(0.19)	(0.16)	(0.01)		
1925-29	(both algorithms failed to converge)				
Chinese					
1950-54	25.5	6.3	1.185	0.334	0.571
	(1.27)	(0.85)	(0.22)		
1945-49	25.2	5.9	1.093	0.662	0.880
	(0.52)	(0.40)	(0.05)		
1940-44	23.4	5.0	0.953	0.146	0.265
	(0.24)	(0.19)	(0.02)		
1935-39	22.8	5.4	0.953	0.281	0.266
	(0.32)	(0.27)	(0.01)		
1930-34	21.6	4.4	0.969	0.072	0.112
	(0.25)	(0.23)	(0.01)		
1925-29	20.2	4.0	0.982	0.512	0.643
	(0.25)	(0.21)	(0.01)		

Note: Figures in brackets are standard errors

that the Chinese estimates in Table 5.6 are slightly lower and no estimates can be obtained for the 1925-29 Malay birth cohort because the algorithms failed to converge. The fit for the Chinese data is again better than for the Malay data and very poor fit is obtained for the 1930-34 Malay cohort. The estimates of the proportion ever married, that is the $\hat{c}$'s, appear reasonable for the Malay women but in two of the Chinese cohorts, an absurd value of more than one was obtained.

As the estimates of c, the proportion ever marrying, are quite low for some groups and absurd for others, it was decided to fix the value of c based largely on census information. The 1947, 1957 and 1970 censuses indicate that about 99 percent of Malay women have ever-married by age 45-49 years while the proportion for Chinese women is 96 percent to 98 percent. As the proportion who ever marry of younger cohorts might decline in the future, it was decided to use four values of c, 0.90, 0.93, 0.95 and 0.99. The estimates of the mean age at marriage and the standard deviation for these values of c as well as the unconstrained c are presented in Table 5.7. The mean values increase at most by about one year when the value of c is increased from 0.90 to 0.99, and this only occurs with the 1950-54 and the 1945-49 Malay cohorts. For the other cohorts, the increase is only about half a year. Thus, even if the proportion ever marrying is predicted to fall to 90 percent, the mean age at marriage is expected to fall by at most one year.*

---

*Raising the values of c rotates the fitted cumulative schedule about the current age of the cohort such that it increases the fitted proportions at older ages and depresses the fitted proportions at younger ages, thereby raising the value of the mean (and standard deviation) (Rodriguez and Trussell, 1980:35).

Table 5.7

Estimates of the Parameters of the Coale-McNeil Model Fitted to Certain Grouped Marriage Data from Both Household and Individual Surveys, when c is fixed at a Preassigned Level, 1974 MFFS

Birth Cohorts	c Fixed at	$\hat{\mu}$	$\hat{\sigma}$	p values Goodness of Fit
Malays				
1950-54	0.90	21.3 (0.20)	5.1 (0.17)	0.352
	0.93	21.5 (0.19)	5.3 (0.18)	0.386
	0.95	21.7 (0.20)	5.4 (0.17)	0.401
	0.99	22.0 (0.20)	5.6 (0.18)	0.411
(c not fixed)*	0.998	22.1 (0.55)	5.7 (0.42)	0.410
1945-49	0.90	19.8 (0.21)	5.0 (0.18)	0.106
	0.93	20.0 (0.22)	5.2 (0.18)	0.126
	0.95	20.2 (0.22)	5.3 (0.18)	0.127
	0.99	20.7 (0.22)	5.8 (0.19)	0.080
(c not fixed)*	0.939	20.1 (0.28)	5.2 (0.24)	0.128
1940-44	0.90	18.4 (0.18)	4.3 (0.16)	0.039
	0.93	18.4 (0.19)	4.3 (0.16)	0.040
	0.95	18.4 (0.19)	4.3 (0.16)	0.040
	0.99	18.8 (0.22)	4.6 (0.20)	0.027
(c not fixed)*	0.962	18.5 (0.20)	4.4 (0.18)	0.040
Chinese				
1950-54	0.90	23.9 (0.29)	5.2 (0.26)	0.269
	0.93	24.0 (0.29)	5.3 (0.26)	0.285
	0.95	24.2 (0.29)	5.4 (0.27)	0.295
	0.99	24.4 (0.29)	5.5 (0.27)	0.310
(c not fixed)*	1.185	25.5 (1.27)	6.3 (0.85)	0.334
1945-49	0.90	23.8 (0.23)	4.8 (0.18)	0.298
	0.93	23.9 (0.23)	5.0 (0.19)	0.384
	0.95	24.1 (0.23)	5.1 (0.19)	0.441
	0.99	24.4 (0.24)	5.3 (0.19)	0.543
(c not fixed)*	1.093	25.2 (0.52)	5.9 (0.40)	0.662
1940-44	0.90	23.1 (0.25)	4.7 (0.21)	0.135
	0.93	23.2 (0.25)	4.8 (0.21)	0.145
	0.95	23.3 (0.26)	5.0 (0.22)	0.147
	0.99	23.8 (0.26)	5.4 (0.22)	0.104
(c not fixed)*	0.953	23.4 (0.24)	5.0 (0.19)	0.146

Note: * Figures in parentheses are standard errors Obtained from Table 5.6

5.2. AGE AT FIRST MARRIAGE AND ITS DETERMINANTS

5.2.1. DIFFERENTIALS IN AGE AT FIRST MARRIAGE

Apart from the effect of education in delaying age at marriage, few generalisations are available on the factors affecting age at first marriage. Factors which are important in one society may not be important in other societies. Furthermore, some factors may only be important at a particular point in time and may not explain trends over time. It is therefore preferable to examine the differentials in age at first marriage using several background variables. These background variables are selected because they have been found to be important in Malaysia and in other societies and also the information on these variables is available from our data sources.

PLACE OF RESIDENCE

It is generally expected that rural areas are more traditional than urban areas. Therefore, women in rural areas are likely to marry at a younger age. This is partly because there is greater parental or familial control over the marriage decision (Blake, 1965) and partly because rural women are less likely to go to school for long periods and there is less opportunity to engage in activities or work outside the home which allow for marriage postponement. The values by childhood residence, defined as the place a woman lived at age 12, from the 1974 MFFS (rf. Table 5.8) indicate that for each birth or marriage cohort the mean age at first marriage was lower for those who

Table 5.8

Mean Age at First Marriage of Malay and Chinese Women Aged 25 Years and Over who Married before Age 25 years by Childhood Residence, Education (in years), Work Status Before Marriage for Various Birth and Marriage Cohorts, 1974 MFFS

Race/ Cohorts	Childhood Residence		Education				Work Status(1)		
	town	village/estate	0	1+	1-6	7+	0	Unpaid	Paid
Birth Cohorts									
Malays									
1945-49	19.4	17.6	16.4	18.4	17.7	20.7	17.7	17.3	19.0
1940-44	17.6	17.0	16.4	17.4	17.1	*	16.8	16.5	18.5
1935-39	17.6	16.4	15.8	17.4	17.1	*	16.4	16.4	17.6
1930-34	16.7	16.0	16.0	16.4	16.3	*	15.9	16.3	16.6
1925-29	16.0	15.6	15.4	16.5	16.4	*	15.4	16.0	16.3
Difference(2)	3.4	2.0	1.0	1.9	1.3	n.app	2.3	1.3	2.7
Chinese									
1945-49	21.4	20.6	20.2	21.1	20.7	22.8	20.7	20.9	21.0
1940-44	20.8	20.3	19.7	20.8	20.6	21.8	20.0	*	20.7
1935-39	19.9	19.4	18.8	20.2	19.9	*	19.2	19.1	20.0
1930-34	19.5	19.1	18.9	19.7	19.5	*	18.9	*	19.8
1925-29	19.1	18.5	18.5	19.1	19.0	*	18.7	18.6	19.0
Difference(2)	2.3	2.1	1.7	2.0	1.7	n.app	2.0	2.3	2.0
Marriage Cohorts									
Malays									
1970-74	*	22.3	*	22.5	22.4	22.8	22.5	*	22.5
1965-69	20.4	19.6	20.2	19.6	19.3	20.9	19.2	20.1	20.7
1960-64	18.3	17.5	17.7	17.6	17.5	19.2	17.4	17.3	18.6
1955-59	17.6	16.6	16.6	16.8	16.7	*	16.6	16.6	17.1
1950-54	16.8	16.2	16.3	16.2	16.2	*	16.0	16.5	16.7
Chinese									
1970-74	23.0	22.8	*	22.9	22.6	23.4	*	*	22.9
1965-69	21.5	21.1	21.1	21.3	21.0	22.6	21.3	20.6	21.4
1960-64	20.8	20.2	19.7	20.7	20.5	21.6	20.4	*	20.4
1955-59	19.9	19.4	19.6	19.6	19.4	*	19.4	*	19.7
1950-54	19.4	19.0	19.0	19.5	19.4	*	19.2	*	19.3

*less than 30 cases
n.app not applicable
(1) 0 refers to women who did not work before marriage
(2) Difference in the mean age at first marriage between the 1925-29 and the 1945-49 birth cohorts

Table 5.9

Mean Age at Marriage of Malay and Chinese Women Obtained from Fitting Coale-McNeil Nuptiality Model to Group Individual Data of Ever-married Women by Various Characteristics, 1974 MFFS

Characteristics/Race	Birth Cohorts					
	1950-54	1945-49	1940-44	1935-39	1930-34	1925-29
1. Education						
Malays						
no education	20.7+	17.9	17.5*+	16.8	17.2	16.5
1 year or more	-	20.5	19.1*+	18.6	17.8	17.4
Chinese						
no education	-	-	21.4*	20.8	20.7	19.7
1 year or more	-	24.8	24.1*	23.8	22.6	20.6
2. Childhood Residence						
Malays						
village or estate	21.3	19.5	18.4	17.5	17.3*	16.7
town	-	-	-	18.9	18.4	-
Chinese						
village or estate	-	-	22.5*+	22.4	21.0	19.9
town	-	-	24.6*+	23.4	22.4	20.5
3. Work Status Before Marriage						
Malays						
did not work	-	19.3	17.9	17.4*+	17.1	16.4
paid employment	-	-	20.7	19.2*+	-	-
unpaid employment	-	19.2	18.2	17.6	17.3	17.1
Chinese						
did not work	-	23.5	22.7*	21.5	20.6	19.7
paid employment	-	-	23.6*	23.9	22.8	21.5
unpaid employment	-	-	-	-	-	-

- mean values not shown because of high standard errors.

* test for goodnesss of fit of the model is not significant at 0.01 level

\+ test for homogeneity of cohorts is not significant at 0.01 level

lived in the village or estate than those who lived in the town. The greatest difference was found in the birth cohort of 1945-49. For each of the cohorts by type of childhood residence, it is found that

the mean age at first marriage of the Chinese was higher than that for the Malays. The results obtained from fitting the Coale-McNeil nuptiality model to the individual data of ever-married women (rf. Table 5.9) indicate that the Chinese women generally married 3-4 years later than the Malay women. Although the values obtained using this method are slightly higher than those obtained in Table 5.8, the trend of mean age at first marriage from both tables increases from older to younger birth cohorts. Table 5.8 shows that the difference between the mean age at first marriage of the 1925-29 and the 1945-49 birth cohorts, both the Malay and Chinese, are higher in the town than in the village or estate. Thus, urbanisation seems to have some effect in delaying marriage.

Table 5.10

Mean Age at First Marriage of Malay and Chinese Women Aged 25 Years and Over who Married before Age 25 Years by Migration Status, 1974 MFFS

Race/Birth Cohorts	Town		Rural	
	Non-migrant	Migrant	Non-migrant	Migrant
Malays				
1945-49	19.6	18.9	19.2	17.4
1940-44	17.8	17.8	17.4	16.9
1935-39	17.8	17.2	17.3	16.3
1930-34	16.9	15.9	16.4	16.0
1925-29	15.2	15.5	16.8	15.6
Chinese				
1945-49	21.5	20.7	21.2	20.5
1940-44	21.2	20.4	20.2	20.2
1935-39	20.0	19.2	19.7	19.6
1930-34	19.4	19.4	19.6	18.8
1925-29	19.4	18.3	18.1	18.8

Classification of the sample by current residence results in more or less the same values as those obtained above. The trend in age at marriage increases from older to younger birth cohorts, women in metropolitan or town areas married later than those in rural areas and Malays married earlier than the Chinese.

Using a simplified definition of a migrant as a woman currently living in an area different from the one in which she was raised, it was found that Malay and Chinese migrants into towns generally married earlier than non-migrants in towns (rf. Table 5.10). On the other hand, both Malay and Chinese migrants into rural areas generally married later than non-migrants in rural areas. Overall, non-migrants in urban areas had the highest mean age at first marriage, non-migrants in rural areas had the lowest while migrants fell between these two extremes.* Thus, it can be taken that urbanisation has some effect on delaying marriage. The disadvantage of using this measure is that the period of residence is not available and no information is available on whether the women migrated before they were married or after they were married. The evidence from studies such as Narayanan (1975) and Lim (1981b) showed that most of the in-migrants to urban areas were young and single. The 1980 Census (1983:83) also indicate that most migrants were young and the main reasons given for migrating were in relation to jobs and marriage.

---

*Figures from the 1966-67 MFS (rf. Appendix 5.1), although not directly comparable with the 1974 MFFS figures, generally indicate that women from the urban areas married later than rural women, Chinese married later than Malays and the mean age at marriage of migrants was between those of rural non-migrants and urban non-migrants. There is no consistent trend across cohorts possibly because these cohorts were born around the time of the world wars and marriage may have been postponed or may have occurred earlier for certain cohorts. Also, in earlier cohorts, those whose marriages have been dissolved (either through death of spouse or divorce) may not have remarried and therefore are excluded from the survey.

LEVEL OF EDUCATION AND LITERACY

The positive relationship between age at marriage and a woman's educational attainment has been documented by many research findings (for example, Smith, 1975; Duza and Baldwin, 1977; Palmore and Ariffin, 1969). The 1974 MFFS indicates that an educated wife, on average, married later than an uneducated one (rf. Tables 5.8 and 5.9). The values by birth cohorts (rf. Tables 5.8 and 5.9) indicate that the difference was larger for the younger cohorts than for the older cohorts of Malay and Chinese women. This may be explained by the fact that educated women in the younger cohorts obtained a higher level of education, and therefore married very much later, than those in the older cohorts. The mean values also indicate an increasing trend of age at marriage from older to younger cohorts, except for the birth cohort of 1935-39.* Early marriage for the 1935-39 cohort may have been a result of the relatively affluent years of the Korean War rubber boom. The increase in mean age at first marriage was higher for the educated than the uneducated women. Also, the mean age at marriage of the Chinese women in each cohort by level of education was higher than for the Malay women. The mean ages at marriage for the various marriage cohorts of women by level of education indicate that those with education did not marry very much later than those without education. In certain cases, the reverse was true. For example, the uneducated Malay marriage cohort of 1965-69 married on average 0.6 of a year later than their counterparts who were educated. The main reason for the inconclusive results is that the educated category is a

---

*The mean ages at marriage estimated for the uneducated Malay and Chinese women in the birth cohort of 1935-39 (rf. Tables 5.8 and 5.9) are slightly lower than the values obtained for the women in the birth cohort of 1930-34. The estimated mean age at first marriage of the educated Malay women in the 1930-34 birth cohort is also slightly lower than the value of the 1925-29 birth cohort.

heterogeneous group. It includes women with one year of education as well as those with university education. More refined classifications of the educated group into two groups, 1-6 years and 7+ years, indicate that women with more education married later than women with less education. Also, Malay women with 7 years or more of education in the recent marriage cohort of 1970-74 married just as late as the Chinese.** Thus, one can postulate that it is not just education but the amount of education that delays marriage. The amount of education that is needed to delay age at first marriage possibly increases from older to younger birth cohorts.

Classification of the sample by whether a woman is literate or illiterate reveals that illiterate women married earlier than literate women. Also, within these groups, Malay women married earlier than Chinese women and the increase in age at first marriage from the older to younger birth cohorts was higher for the literate than the illiterate group. Thus, literacy also seems to have some effect on delaying age at first marriage.

WORK STATUS BEFORE MARRIAGE

Women who did not work before marriage tended to marry earlier than those who did (rf. Table 5.8 and 5.9). If the values of mean age at marriage for those who worked in paid or unpaid employment are compared, those who were in paid employment tended to marry later. However, the increase in the mean age at first marriage was not higher

---

** The 1966-67 MFS indicates no consistent trend across birth cohorts by education level for reasons specified earlier. Generally, however, educated women married later than uneducated women (rf. Appendix 5.1).

for those who worked before marriage than for those who did not. Data from the 1966-67 MFS (rf. Appendix 5.1) indicate that women who had worked away from home before marriage generally married later than those who worked at home or did not work before marriage.

To summarise, it appears that all the background variables do have some influence on the age at which a woman marries. AID3 is next used in the search for a model.

5.2.2. MULTIVARIATE ANALYSES - AGE AT FIRST MARRIAGE

LOCATING INTERACTION EFFECTS

To evaluate and quantify the importance of the four background variables, race, childhood residence, education and work status before marriage, on age at first marriage, multivariate analysis is used. In order to use techniques like Multiple Classification Analysis (MCA), however, the assumption of additivity has to be first tested. In this section, an attempt is therefore made to assess the structure of an age at first marriage model. The AID3 technique,* as described in Chapter 3, is selected because it is able to locate interactions among predictors. All the above background variables as well as the age at marriage variable from the 1974 MFFS data fulfil the requirements for the application of the AID technique. Briefly, AID requires (1) a sample size of one thousand cases or more; (2) that the predictors should have classifications of less than 31 categories, preferably 3-7 categories; (3) that the dependent variable should not be extremely

---

*For simplicity, in subsequent discussion, AID3 will be referred to as AID.

skewed or severely bimodal; a dichotomous dependent variable should take one of its values more than 20 and less than 80 percent of the time; and (4) that predictors should not be highly correlated; highly correlated predictors lead to instability of results. The following conditions, or stopping rules, are used in the AID-search program: (i) minimum size of a group - 25 cases, (ii) maximum number of splits or partitions as 30, and (iii) the minimum increase in explanatory power required for a split as 0.6 percent.

Figure 5.1 displays the best splits on age at first marriage for the MFFS total sample: Malay and Chinese women aged 25 years and over who married before age 25 years. The above four background variables were used as explanatory variables in this run. Race emerged as the most important explanatory variable followed by education. These two variables together explained about 32 percent of the variation in age at first marriage. The tree looks symmetrical, suggesting additivity of predictor effects. Other evidence, however, does not support the absence of interaction effects. A variable is capable of being included into an additive model if the profile of effects in one part of the sample is approximately the same as its profile of effects in another branch, that is the two profiles should be congruent. If the profile of the means are not congruent and differential changes in explanatory power occur across groups, the variable can be considered a candidate for inclusion in an interaction term. The profile of means, ignoring those with small sample sizes, as presented in Figure 5.2, and the proportion of the variation that is explained by a partition using the variable under consideration as presented in Table 5.11, indicate the presence of interaction effects. Interaction effects may not be important if the adjusted R^2 from MCA, which does

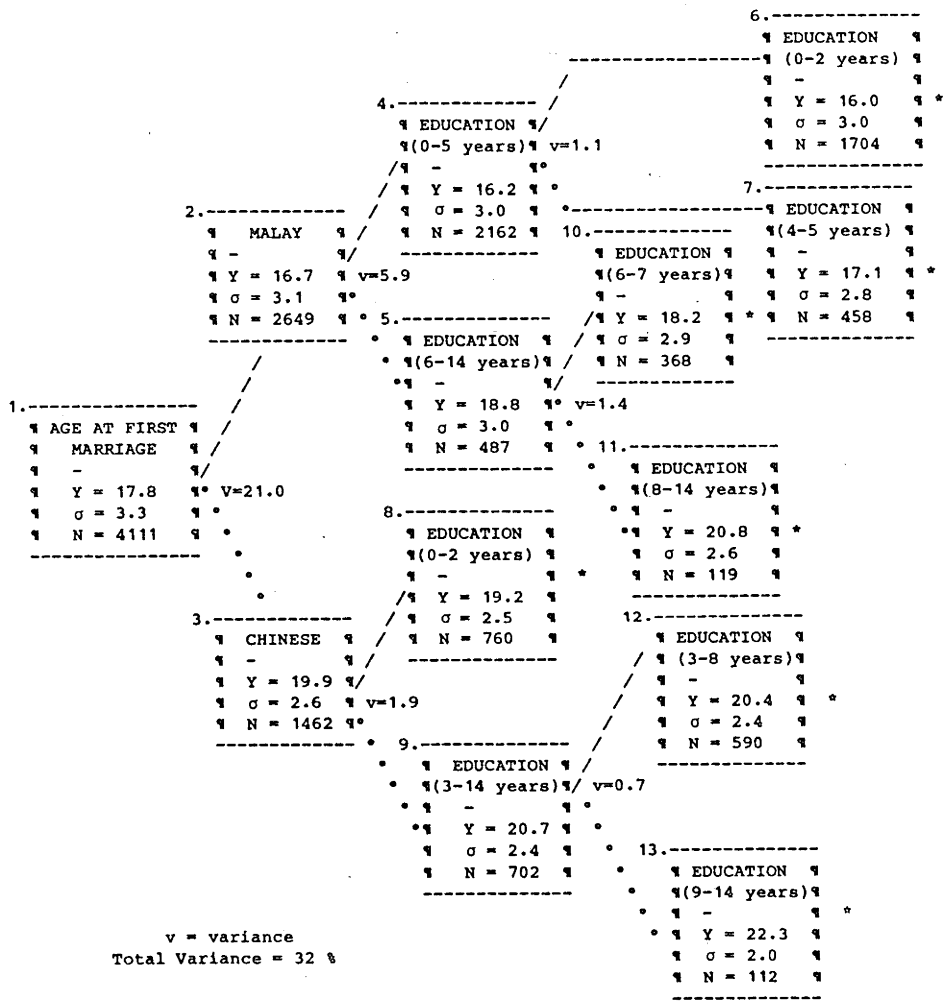
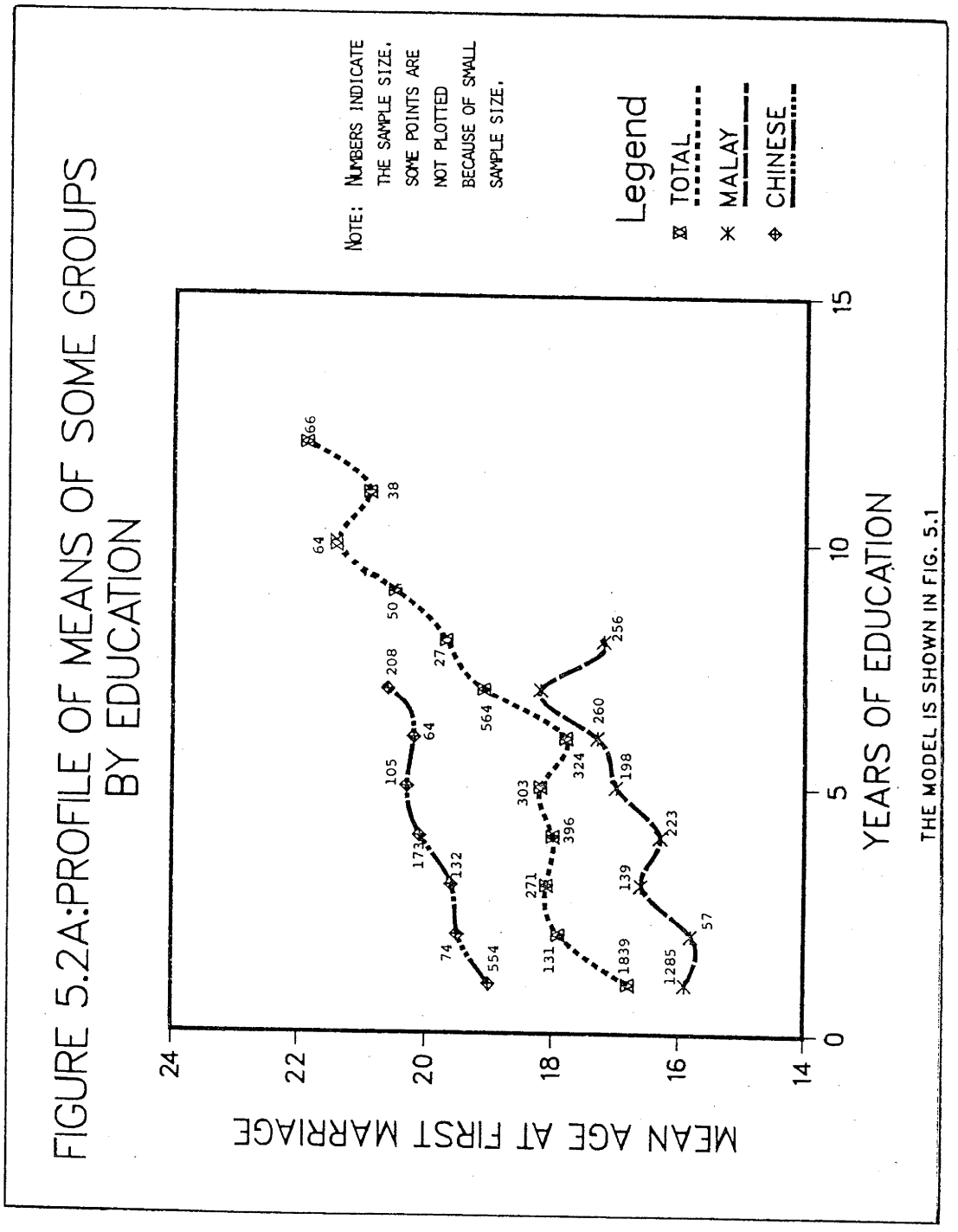
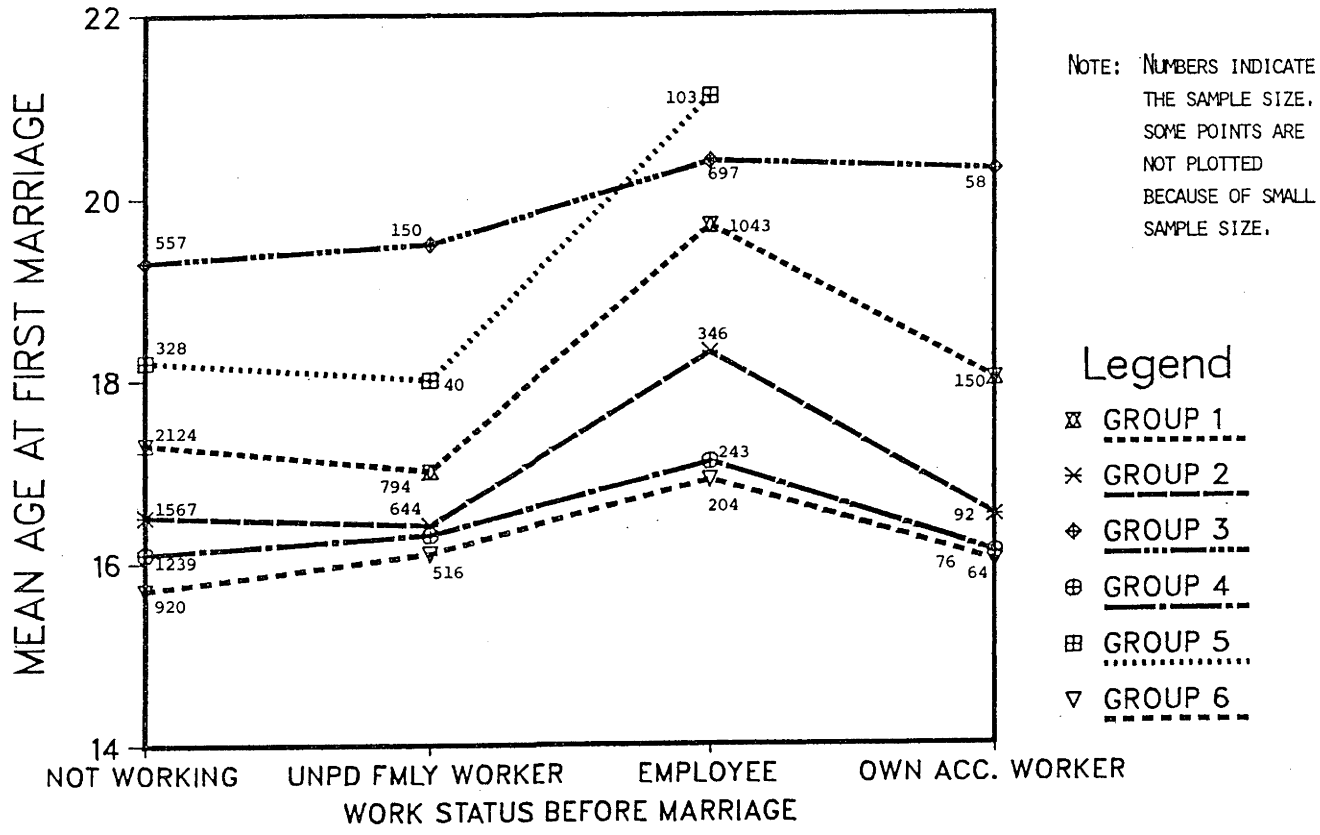


FIGURE 5.1: AID TREE OF BEST SPLITS ON AGE AT FIRST MARRIAGE, TOTAL SAMPLE OF MALAY AND CHINESE WOMEN AGED 25 YEARS AND OVER, MARRIED BEFORE AGE 25 YEARS, 1974 MFFS



THE MODEL IS SHOWN IN FIG. 5.1

FIGURE 5.2B:PROFILE OF MEANS OF SOME GROUPS BY WORK STATUS BEFORE MARRIAGE



THE MODEL IS SHOWN IN FIGURE 5.1

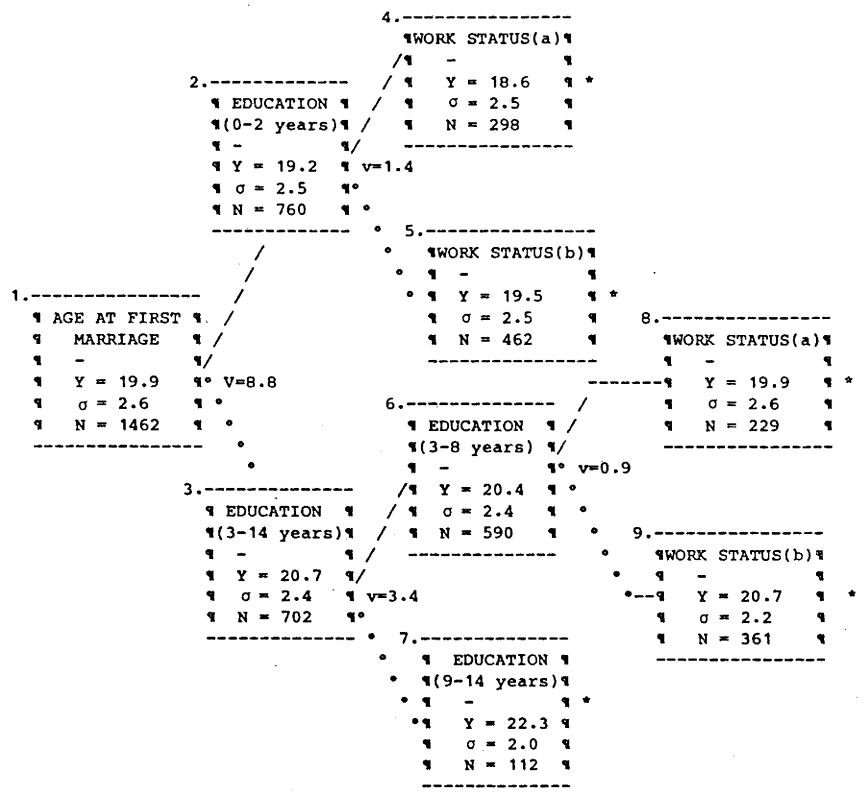
Table 5.11

Age at First Marriage Analysis, Women Aged 25 Years and Over who Married before Age 25 Years, Proportion of Variation in Group Explainable for each Predictor (BSS_{ij}/TSS_i)

Predictor	Group Number					
	1	2	4	6@	3	8@
Level of Education	[0.09]	0.06 ------->	0.01	0.02 --------->	0.19	0.01 ------->
Childhood Residence	0.06	[0.08] ------->	0.00	0.00	0.02	0.00
Race (Chinese or Malay)	0.21	constant	constant		constant	
Work Status Before Marriage	0.03	0.04	[0.02]	[0.03]	[0.07]	[0.03]
N	4111	2649	2162	1704	1462	760
TSS_i/TSS_T	1.00	0.57	0.42	0.33	0.22	0.11
Mean	17.8	16.7	16.2	16.0	19.9	19.2

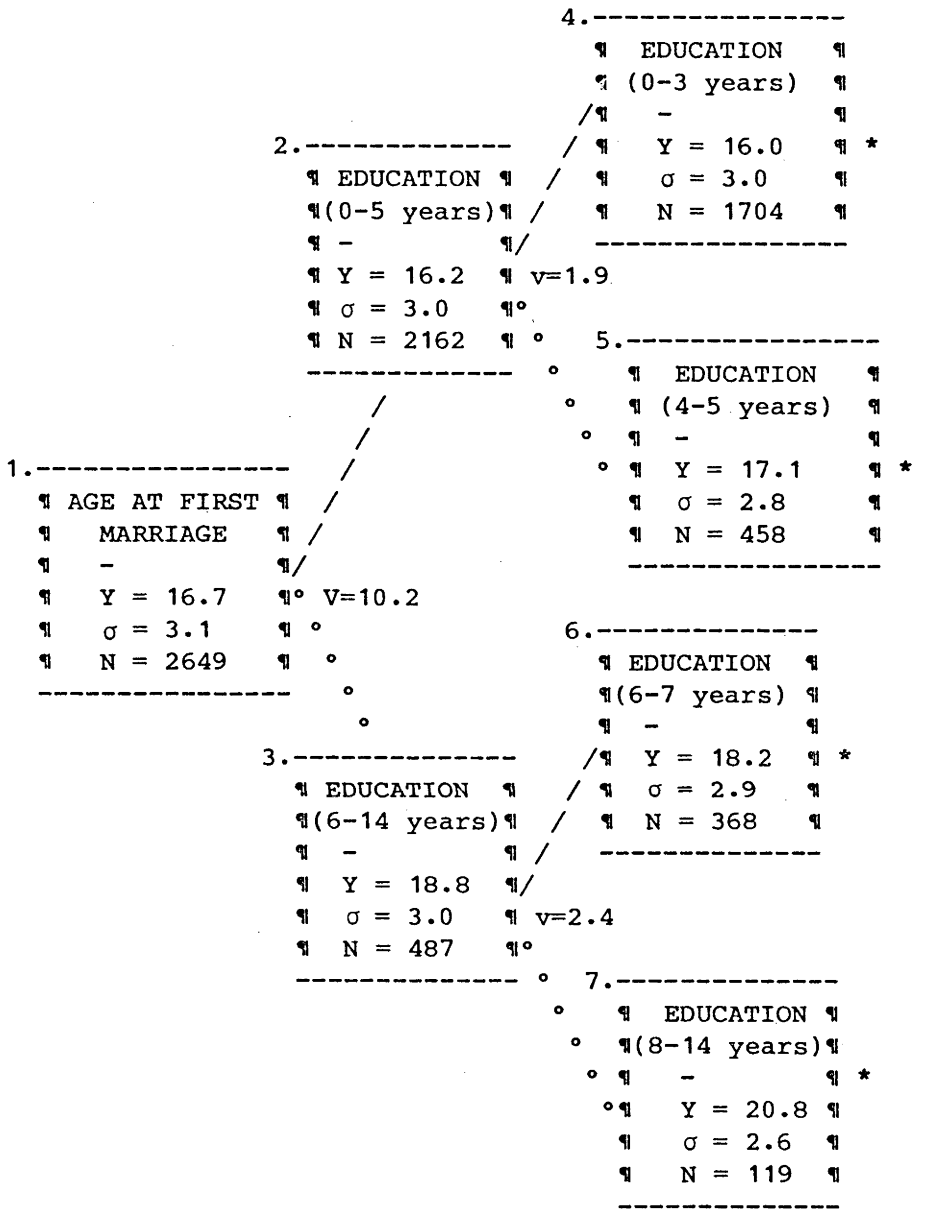
@ Final Group
---> Split made on this variable
[ ] Next best BSS/TSS
TSS_i/TSS_T Percentage of Total Variation remaining in this Group.

not allow for interaction, is greater than or equal to the R^2 obtained from AID-search. In this case, the adjusted R^2 from MCA is similar to that obtained from AID-search, suggesting that interaction effects may not be important (see Sonquist, 1975, Chaps. 5-6, for further information). The analysis of variance results indicate that two factor interactions are significant at 0.01 while three and four factor interactions are not significant (see Appendix 5.2). The only two-factor interaction that is significant at 0.01 level is race-education while race-childhood residence is



Note: Work Status is work status before marriage
(a) not working
(b) working (paid and unpaid)
v = variance
Total Variance = 14.5 %

FIGURE 5.3A : AID TREE OF BEST SPLITS ON AGE AT FIRST MARRIAGE, CHINESE WOMEN AGED 25 YEARS AND OVER, MARRIED BEFORE AGE 25 YEARS, 1974 MFFS



v = variance
Total Variance = 14.5 %

FIGURE 5.3B : AID TREE OF BEST SPLITS ON AGE AT FIRST MARRIAGE, MALAY WOMEN AGED 25 YEARS AND OVER, MARRIED BEFORE AGE 25 YEARS, 1974 MFFS

significant at 0.05 level.

A second series of AID analysis was carried out separately for the Malay and Chinese women to see whether the presence of interaction effects is reduced. The tree diagram for these analyses is displayed in Figure 5.3. For the Malay women, only education is found to be an important determinant of age at first marriage. For the Chinese women, in addition to education, work status before marriage explains about 2.5 percent of the variation in age at first marriage of women educated for 8 years or less. Both trees look symmetrical, suggesting additivity of predictor effects. The profile of means as displayed in Figure 5.4 and the proportion of the variance explained by a partition using the variable under consideration (rf. Table 5.12) indicate that interaction effects are greatly reduced. The MCA adjusted R^2 for the Chinese women and the R^2 obtained from AID-search are of the same magnitude. The MCA adjusted R^2 for the Malay women, however, is less than that obtained from AID-search. The analyses of variance carried out for the two racial groups separately (rf. Appendix 5.3) reveal that the two factor interactions are not significant at 0.01 level for the Chinese group but they are still significant for the Malay group. Closer examination of the two factor interactions reveals that only the interaction between childhood residence and work status before marriage is significant at 0.01 level. Thus, for the Malay group, for the additivity assumption to be satisfied, a new variable has to be created, using combinations of the categories of childhood residence and work before marriage.*

---

*The interaction between this variable and education level is not significant at 0.01 level. Also, the adjusted R^2 from MCA is about the same as that obtained from AID-search.

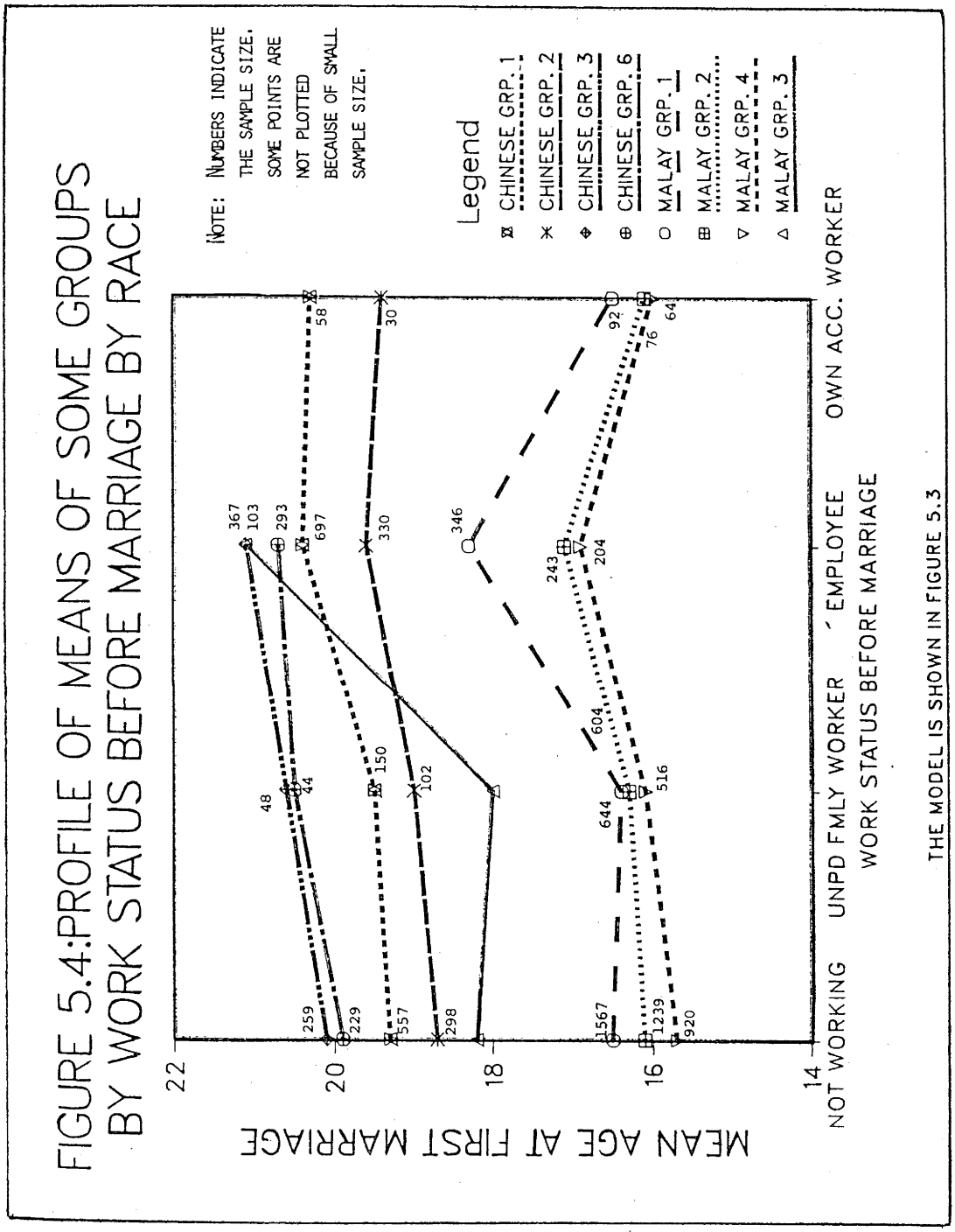


FIGURE 5.4:PROFILE OF MEANS OF SOME GROUPS
BY WORK STATUS BEFORE MARRIAGE BY RACE
NOTE: NUMBERS INDICATE THE SAMPLE SIZE, SOME POINTS ARE NOT PLOTTED BECAUSE OF SMALL SAMPLE SIZE.
Legend
CHINESE GRP. 1
CHINESE GRP. 2
CHINESE GRP. 3
CHINESE GRP. 6
MALAY GRP. 1
MALAY GRP. 2
MALAY GRP. 4
MALAY GRP. 3
MEAN AGE AT FIRST MARRIAGE
22
20
18
16
14
NOT WORKING
UNPD FMLY WORKER
EMPLOYEE
OWN ACC. WORKER
WORK STATUS BEFORE MARRIAGE
THE MODEL IS SHOWN IN FIGURE 5.3

Table 5.12

Age at First Marriage Analysis, Malay and Chinese Women Aged 25 Years and Over who Married before Age 25 Years, Proportion of Variation in Group Explainable for Each Predictor (BSS_{ij}/TSS_i)

Predictor	Race						
	Chinese				Malays		
	Group Number				Group Number		
	1	2	3	6	1	2	3
Level of Education	0.09 -->	0.01 -->	0.03 -->	0.03	0.10 -->	0.02 -->	0.02
Childhood Residence	0.01	0.00	0.00	0.00	[0.01]	0.00	0.00
Work Status before	[0.03]	[0.01]	[0.02]	[0.09]	0.06	[0.00]	[0.01]
N	1462	760	702	590	2649	2162	487
TSS_i/TSS_T	1.00	0.50	0.41	0.34	1.00	0.73	0.57
Mean	19.9	19.2	20.7	20.4	16.7	16.2	16.0

--> Split made on this variable
[ ] Next best BSS/TSS

MULTIPLE CLASSIFICATION ANALYSIS

As interaction effects appear to be relatively unimportant when the analysis is performed separately for each ethnic group, MCA is next used to estimate the effects of the background variables on age at first marriage. Further, as the main interest of this thesis is on cohorts, the analysis will be carried out separately for birth cohorts to see whether the importance of these determinants differs across

Table 5.13

MCA Results: Mean Age at First Marriage of Malay and Chinese Ever-Married women Aged 25 Years and Over who Married before Age 25 Years, 1974 MFFS

Race	Level of Education (in years) None	1-6	7+	Difference
Malays	15.9	17.2	20.6	4.6
N	1286	1237	131	
+ Covariates (childhood residence x work status before marriage)[1]	15.9	17.2	19.9	4.0
Chinese	19.0	20.1	22.0	3.0
N	554	756	152	
+ Covariates (childhood residence + work status before marriage)[1]	19.0	20.1	21.9	2.9

cohorts.**

Table 5.13 indicates that a Malay woman with at least 7 years of education married on average 5 years later than one with no education. The additional control for the new variable, childhood residence x work status, that is allowing for interaction between these two variables, gives a difference of about 4 years between the age at first marriage of women with no education and women with 7 or more

---

** The analysis is not carried out separately for marriage cohorts because the analysis of variance results indicate that for most of the marriage cohorts almost all of the determinants are not significant.

years of schooling. The Chinese women with no education married on average three years earlier than those with seven years of education or more. Control for childhood residence and work status reduces the difference by 0.1 year. The MCA results thus support the analysis of variance results (rf. Appendix 5.2 and 5.3) in that education is more important in affecting age at marriage than work status before marriage and childhood residence. Childhood residence, according to the analysis of variance results, has minimal effect on the age at first marriage; in certain cases, for example the Chinese women (rf. Appendix 5.3), the effect is not significant.

Table 5.14

MCA Results: Mean Age at First Marriage by Educational Groupings with control for Work Status and Childhood Residence for Malay and Chinese Birth Cohorts, 1974 MFFS

Race / Birth Cohorts	Years of Education		Difference
	0	1+	
Malays			
1945-49	16.3	18.3	2.0
1940-44	16.3	17.5	1.2
1935-39	15.8	17.4	1.6
1930-34	15.9	16.4	0.5
1925-29	15.4	16.5	1.1
Chinese			
1945-49	20.3	21.1	0.8
1940-44	19.8	20.8	1.0
1935-39	18.9	20.1	1.2
1930-34	18.9	19.7	0.8
1925-29	18.5	19.1	0.6

It is interesting to note that the mean age at first marriage of birth cohorts shows an increasing trend, with slight fluctuations, within education categories, with control for childhood residence and work status (rf. Table 5.14). The combined effect of education plus work status plus childhood residence in delaying marriage is different for the educated and uneducated women in the various birth cohorts. The effect of these variables in delaying marriage of the Malay women in the 1945-49 birth cohort is two years between the educated and uneducated. The effect of these variables, however, is only 0.5 years between educated and uneducated Malay women in the 1930-34 birth cohort. If comparison is made between the younger and older Malay birth cohorts, the effect of these variables in delaying marriage of educated and uneducated women is definitely very much greater for younger cohorts. This effect is not obvious for the Chinese women although there is a slight increase in the difference between the 1940-44 and the 1925-29 birth cohorts.

Thus, education is important in affecting the age at which a Malay or a Chinese woman marries. Work status before marriage also seems to have some effect on delaying marriage while childhood residence has very little effect. The effect of education in delaying marriage is found to be greater in the younger cohorts than the older ones. This is largely explained by the fact that in the younger cohorts, not only is there a greater proportion of educated women but more women are educated to a higher level.

5.3. CORRELATES OF DIVORCE

The evidence from studies carried out in Western societies yields a variety of findings on the effect of children's absence or presence, and their age, on divorce; these studies are mentioned in Chap. 1. These studies are of course very culture specific and may not be applicable to Malaysia. Evidence from other studies, also largely based on Western societies, indicates that the probability of divorce is lower the longer the duration of marriage and the older the husband and wife at the time of marriage (Jacobson, 1950; Bumpass and Sweet, 1972; Carter and Glick, 1976; Cherlin, 1977), and the higher the educational attainment; the effect is weak if other variables are controlled (Goode, 1962; Bernard, 1966; Udry, 1966; Bumpass and Sweet, 1972). A number of studies also found that the probability of divorce for remarried persons, who were previously divorced, is higher than for those in first marriages (Monahan, 1955; Glick and Norton, 1971; Bumpass and Sweet, 1972; Becker et al., 1976; Hoffman and Holmes, 1976; Cherlin, 1977); and premarital birth increases the probability of divorce (Christensen, 1963; Bumpass and Sweet, 1972). Cherlin (1977) also found that the probability of divorce is higher for wives who were older than their husbands by 5 years or more or younger than their husbands by 9 years or more. Cutright (1971), using a causal model on the 1960 United States census data, found support for the hypothesis that income, rather than other indicators of the family's position in the social structure, had direct effect on the stability of American marriages.

Not much work has been done on marital stability using Malaysian data. Perhaps Palmore and Ariffin (1969), Jones (1980) and Tan and Siti (1981) are the only studies. Palmore and Ariffin (1969), using the 1966-67 West Malaysian Family survey data found that women who were married more than once generally had lower cumulative fertility within age at marriage categories and tend to have married at younger ages than women married only once. Jones (1980) found that there was a rise in the age at marriage between 1947 and 1970 for all races but divorce rates for the Malay community, over this period, have declined. Tan and Siti (1981), using the 1974 MFFS data, found that both education and age at marriage have significant negative effects on the mean number of times a woman marries.

5.3.1. DIFFERENTIALS IN THE PROBABILITY OF DIVORCE

One of the major concerns of this study is to seek factors influencing the divorce rate. Some socio-demographic factors, like residential origin, education, income, age at first marriage, work experience, and children born in the first marriage, are examined for their effect on divorce. The following are some of the hypotheses tested:

1. The probability of divorce is higher for a woman in the rural area compared with a woman in an urban area. This is based on the argument that women have lower status in the rural areas and marriages tend to be arranged. Also, marriage may not be so easily dissolved in the urban areas because of difficulties and costs.
2. An educated woman has higher status and has more say in the choice

of marriage partner. Therefore, the probability of divorce of a woman in this category is lower compared with an uneducated woman.

3. The earlier the age at marriage the higher the probability of divorce. This is based on the argument that marriages at young ages tend to be arranged and the couple tend to be immature. Evidence from the 1974 MFFS indicate that the average age at divorce ranges between 19 and 21 years from older to younger marriage cohorts.
4. Women who work tend to spend less time on the family. Thus, the probability of divorce for women who work is higher than for those who do not.
5. As shown in the last chapter, children are very highly valued especially for old age security. In view of this, the probability of divorce is higher for women without children than for those with children.
6. The probability of divorce tends to be lower the longer the duration of marriage.

BIRTH COHORTS

The probability of divorce of birth cohorts of Malay women shows a declining trend over time (rf. Table 5.15). For the Chinese women, there is no consistent trend across cohorts. The highest probability of divorce occurred among women born in the 1930s who would have married just after World War II or in the 1950s. Even then, the probability of divorce after 10 years of marriage was only 4 percent. Older cohorts may have misreported the year of marriage or the year of termination of marriage or both. For younger cohorts, due to

Table 5.15

Cumulative Probability of First Marriages (excluding marriages terminated by death of spouse) Terminating in Divorce within Selected Periods for Ever-married Women Aged 25 years and Over, Married before Age 25 Years by Various Characteristics, Using Life Table Technique, 1974 MFFS

Various Characteristics	Duration from Marriage to Divorce (Years) 1	2	3	4	5	10	No of Cases
Birth Cohorts							
Malays							
1945-49	0.040	0.075	0.103	0.125	0.139	0.169	531
1940-44	0.075	0.103	0.123	0.137	0.149	0.176	439
1935-39	0.076	0.122	0.154	0.163	0.183	0.219	517
1930-34	0.092	0.124	0.168	0.177	0.186	0.230	348
1925-29	0.104	0.154	0.193	0.224	0.224	0.274	348
Chinese							
1945-49	0.000	0.003	0.003	0.011	0.011	0.024	322
1940-44	0.000	0.000	0.004	0.004	0.004	0.008	279
1935-39	0.009	0.017	0.017	0.022	0.022	0.044	230
1930-34	0.004	0.004	0.004	0.009	0.009	0.018	226
1925-29	0.000	0.005	0.005	0.005	0.010	0.010	200
Marriage Cohorts							
Malays							
1965-69	0.020	0.030	0.040	0.050	0.066	n.app	198
1960-64	0.043	0.073	0.100	0.133	0.141	0.175	371
1955-59	0.072	0.119	0.150	0.164	0.178	0.191	448
1950-54	0.079	0.101	0.130	0.148	0.155	0.194	395
Chinese							
1965-69	0.000	0.004	0.004	0.008	0.008	n.app	254
1960-64	0.000	0.004	0.008	0.013	0.013	0.021	237
1955-59	0.000	0.004	0.004	0.008	0.008	0.022	261
1950-54	0.015	0.020	0.020	0.025	0.025	0.035	204
Race							
Malays	0.076	0.115	0.146	0.164	0.174	0.212	2692
Chinese	0.002	0.005	0.007	0.010	0.011	0.020	1533
Age at First Marriage							
Malays							
Less than 17	0.094	0.143	0.183	0.206	0.216	0.252	1533
17,18	0.050	0.085	0.104	0.116	0.120	0.162	522
19,20	0.077	0.106	0.116	0.136	0.136	0.173	313
21+	0.034	0.057	0.074	0.084	0.096	0.147	324

(cont'd Table 5.15)

Chinese							
Less than 17	0.005	0.010	0.010	0.010	0.010	0.030	211
17,18	0.006	0.009	0.009	0.011	0.011	0.017	354
19,20	0.000	0.006	0.003	0.003	0.003	0.003	355
21+	0.000	0.002	0.003	0.009	0.009	0.019	613
Current Residence							
Malays							
Metropolitan or Small Town	0.043	0.084	0.103	0.106	0.114	0.156	422
Rural	0.082	0.121	0.154	0.175	0.185	0.223	2270
Chinese							
Metropolitan or Small Town	0.002	0.006	0.008	0.014	0.015	0.025	843
Rural	0.003	0.004	0.006	0.006	0.006	0.015	690
Childhood Residence							
Malays							
Town	0.036	0.092	0.102	0.111	0.111	0.159	359
Village or Estate	0.082	0.121	0.153	0.172	0.184	0.221	2330
Chinese							
Town	0.000	0.005	0.005	0.009	0.011	0.019	666
Village or Estate	0.004	0.006	0.008	0.011	0.011	0.022	867
Migrant Status							
Malays							
Non-migrants							
Town	0.033	0.082	0.104	0.104	0.104	0.150	186
Rural	0.086	0.125	0.159	0.179	0.191	0.227	2094
Migrants	0.046	0.083	0.101	0.111	0.119	0.163	412
Chinese							
Non-migrants							
Town	0.000	0.007	0.007	0.014	0.016	0.027	452
Rural	0.004	0.006	0.009	0.009	0.009	0.021	476
Migrants	0.002	0.003	0.005	0.009	0.009	0.014	605

(cont'd Table 5.15)

Education (in years)							
Malays							
None	0.103	0.159	0.198	0.218	0.227	0.277	1297
1-6	0.056	0.080	0.106	0.122	0.132	0.159	1252
7+	0.007	0.029	0.029	0.038	0.056	0.080	143
Chinese							
None	0.004	0.005	0.007	0.011	0.011	0.020	572
1-6	0.001	0.004	0.005	0.007	0.008	0.016	784
7+	0.000	0.012	0.012	0.025	0.025	0.044	176
Work Status							
Malays							
Ever-worked**	0.086	0.131	0.169	0.190	0.203	0.244	1860
Never-worked	0.053	0.080	0.096	0.105	0.110	0.139	831
Chinese							
Ever-worked**	0.003	0.007	0.009	0.011	0.012	0.025	1186
Never-worked	0.000	0.000	0.000	0.006	0.006	0.006	347
Number of Children in First Marriage							
Malays							
None	0.321	0.595	0.664	0.701	0.718	0.765	345
1 or more	0.005	0.022	0.037	0.054	0.063	0.092	2317
no son	0.024	0.073	0.135	0.192	0.224	0.298	247
1 son or more	0.002	0.016	0.025	0.038	0.044	0.069	2070
Chinese							
None	*	*	*	*	*	*	27
1 or more	0.000	0.001	0.002	0.004	0.004	0.013	1438
no son	0.000	0.010	0.010	0.022	0.036	0.055	99
1 son or more	0.000	0.000	0.002	0.002	0.002	0.010	1339

*less than 30 cases at risk
**includes currently working

Table 5.16

Cumulative Probability of First Marriages (excluding marriages terminated by death of spouse) Terminating in Divorce within Selected Periods of Birth and Marriage Cohorts, Malay and Chinese Ever-married Women Aged 25 Years and Over, Married before Age 25 Years by Current Residence, Using Life Table Technique, 1974 MFFS

Race /Birth and Marriage Cohorts/ Current Residence	Duration from Marriage to Divorce (in years) 1	2	3	4	5	No of Cases
Birth Cohorts						
Malays						
1940-44						
Metropolitan*	0.067	0.117	0.117	0.117	0.134	60
Rural	0.077	0.100	0.124	0.140	0.151	379
1935-39						
Metropolitan*	0.053	0.107	0.117	0.117	0.128	94
Rural	0.081	0.126	0.162	0.174	0.195	423
1930-34						
Metropolitan*	0.055	0.073	0.093	0.093	0.093	56
Rural	0.100	0.134	0.182	0.193	0.203	292
Chinese						
1940-44						
Metropolitan*	0.000	0.000	0.007	0.007	0.007	140
Rural	0.000	0.000	0.000	0.000	0.000	139
1935-39						
Metropolitan*	0.008	0.016	0.016	0.024	0.024	126
Rural	0.010	0.019	0.019	0.019	0.019	104
1930-34						
Metropolitan*	0.000	0.000	0.000	0.008	0.008	134
Rural	0.011	0.011	0.011	0.011	0.011	92
Marriage Cohorts						
Malays						
1960-64						
Metropolitan*	0.021	0.083	0.104	0.104	0.104	48
Rural	0.047	0.072	0.100	0.137	0.147	323
1955-59						
Metropolitan*	0.041	0.095	0.123	0.123	0.123	74
Rural	0.079	0.128	0.165	0.180	0.195	329
1950-54						
Metropolitan*	0.017	0.033	0.033	0.033	0.033	60
Rural	0.090	0.114	0.147	0.168	0.177	335
Chinese						
1960-64						
Metropolitan*	0.000	0.009	0.009	0.018	0.018	114
Rural	0.000	0.000	0.008	0.008	0.008	123
1955-59						
Metropolitan*	0.000	0.000	0.000	0.000	0.000	115
Rural	0.000	0.010	0.010	0.010	0.010	100
1950-54						
Metropolitan*	0.008	0.016	0.016	0.024	0.024	126
Rural	0.026	0.026	0.026	0.026	0.026	78

* includes small towns

selection bias, those who have longer marital durations tend to have married at young ages. Many of these young marriages end in divorce either because of immaturity or because of incompatibility, as many of these marriages were arranged. Therefore, to reduce the selection bias and bias from misreporting, the probability of divorce is calculated for three birth cohorts, 1930-34, 1935-39 and 1940-44, for specified periods, 5 years or less, from the year of marriage (rf. Table 5.16). The values for the Malay women show that the probability of divorce has declined over time for the rural areas. In the metropolitan or small towns, except for minor fluctuations, the probability of divorce indicates an increasing trend. This is probably due to the large number of rural-born migrants moving into the towns in more recent times, carrying their higher-divorce patterns with them. Generally, however, at each period after marriage, the probability of divorce was lower in the metropolitan or small towns than in the rural areas. This is also true for the 1930-34 Chinese cohort but in the later cohorts, a reverse pattern is observed for some periods. The results in this table again indicate that the probability of divorce was higher for the 1930 cohorts than for the 1940-44 cohort.

MARRIAGE COHORTS

When analysed according to marriage cohorts, the probability of first marriage terminating in divorce has generally declined over time (rf. Table 5.15), except for some values in the 1950-54 Malay marriage cohort, which may have resulted from reporting errors, and some minor fluctuations in some periods in the 1960-64 Chinese marriage cohort.

For example, the probability of Malay first marriages terminating in divorce within four years of marriage has declined from 14.8 percent for the cohort married in 1950-54 to 5.0 percent for the cohort married in 1965-69. The figures also indicate that the probability of divorce is lower the longer the marital duration.

If observation is restricted to three marriage cohorts, 1960-64, 1955-59 and 1950-54, that is three marriage cohorts of women married for at least ten years, the pattern as shown in Table 5.16 is obtained. The overall pattern, except for minor fluctuations, agrees with the earlier results of decline in the probability of divorce over time in the rural areas but an increase in the urban areas for Malay women. Thus, in the rural areas, improved social status of women and a decline in marriage arrangement seem to have led to a fall in the divorce rate (rf. Chap. 2). For the Chinese women, there is an indication of a decline in the probability of divorce in the rural areas. In the urban areas, a U-shaped pattern is observed, that is women who married just after World War II and those who married in the 1960s had a higher probability of divorce than women married in 1955-59.

ETHNICITY

As seen earlier in this chapter, Malay women marry earlier than Chinese women. Early age at first marriage is associated with a higher risk of divorce. Therefore, if the relationship between age at first marriage and the risk of divorce holds, then the probability of divorce for a Malay woman should be higher than that for a Chinese

woman, holding all other factors constant. The question then is whether ethnicity, that is whether one is a Malay or a Chinese, has an effect on the risk of divorce, net of the effect of age at first marriage. Irrespective of the age at marriage, Chinese have lower divorce rates. For example, Table 5.15 indicates that the probability of divorce within five years of marriage was 17.4 percent for Malay women compared with 1.1 percent for Chinese women. Within 10 years of marriage, Malay women had a probability of divorce of 21.2 percent while the same probability for the Chinese women was 2 percent.

AGE AT FIRST MARRIAGE

The relationship between age at first marriage and the risk of divorce has generally been found to be a negative one. Sweet (1977), for example, found that in the United States, persons who marry at young ages have higher risks of marital dissolution ending in divorce than those who marry at older ages. Budi Soeradji (1979:122) also found the negative relationship to be true for Indonesia. According to Palmore and Ariffin (1969:392), using the 1966-67 Malaysian Family Survey (MFS), 'With few exceptions, the social groups that married early had a relatively high proportion of women who had married more than once'. Data from the 1974 MFFS (rf. Table 5.15) also support this relation, except for the group of Malay women who married at 19-20 years of age. Regardless of the marital duration, the probability of divorce for this group of women was higher than for those married at ages 17-18 years of age. The difference is however about 1 percent only and reporting errors may be responsible.

RESIDENTIAL BACKGROUND

Urban areas are generally considered less traditional than rural areas. Hence, the divorce rate is expected to be higher in the rural than the urban areas. Also, as observed earlier in this chapter, women of rural origin tend to marry earlier than those from urban areas. In the rural areas too, among other factors, women are less educated and have lower status. Rural areas also tend to be predominantly Malay areas and divorces are socially accepted by Malays, although the divorce rates are declining, as shown above and in Chap. 2. The 1974 MFFS data (rf. Table 5.15) indicate that for all marital durations, the probability of divorce for Malay women was higher in the rural areas than in the metropolitan or town areas.* For example, the probability of divorce within the first five years of marriage in the rural areas is 18.5 percent compared with 11.4 percent for women in metropolitan or small town areas. For Chinese women, except for the period one year after marriage, the probability of divorce was higher in the metropolitan or small town areas than in the rural areas. From Table 5.15, it can also be seen that the patterns by childhood residence are similar to those by current residence. The only exception is that Chinese women who originated from the village or estate had a higher probability of divorce than women from town areas. The difference in the probabilities of divorce for the two areas by childhood residence is not the same as that for the two areas by current residence. Differences in definitions of residence may be

---

*Palmore and Ariffin (1969:390) found that Malay and Chinese women in rural areas had a higher incidence than urban women of being married more than once.

partly responsible.

Using the simple definition of migration as used earlier in the section under age at first marriage, that is comparing current and childhood residence, it can be seen that for the Malay women non-migrants in towns have the lowest probability of divorce while non-migrants in rural areas have the highest probability of divorce (rf. Table 5.15). The probabilities of divorce for migrants fall in between these two extreme values. For the Chinese women, the probability of divorce in the first three years after marriage for rural non-migrants is similar to or higher than for town non-migrants; but in later periods, town non-migrants had a higher probability. Chinese migrants had a lower probability of divorce than non-migrants. One can tentatively conclude from these observations that industrialisation and/or urbanisation have some impact on lowering the probability of divorce of Malay women.

YEARS OF EDUCATION

Several researchers, among them Bumpass and Sweet (1972) and Palmore and Ariffin (1969), have found some evidence of a negative relationship between education and marital instability. Women with no education tend to have lower status and arranged marriages and therefore have a higher incidence of divorce. Further, those with no education tend to marry earlier and to come from more traditional areas. Figures from Table 5.15 indicate that the probability of divorce for Malay women was very much higher for those with no education than those with some formal schooling. For example, the

probability of a marriage terminating in divorce within five years of marriage is 22.7 percent for an uneducated woman, 13.2 percent for one with 1-6 years of schooling and 5.6 percent for one with 7 or more years of schooling. For the Chinese women, those with more than 7 years of schooling have the highest probability of divorce, followed by those with no schooling.

WOMAN'S WORK EXPERIENCE

The work experience variable considered here is whether the woman has ever worked, either before or after marriage, or is currently working and is classified roughly as ever-worked or never-worked. Women who have worked or are currently working are expected to be more independent and tend to have less time to do household chores and take care of the family. The probability of divorce for this group of women is therefore expected to be higher than for women who have never worked. From Table 5.15, the probability of divorce for those women who ever-worked is higher than for women who never worked.* For example, the probability of divorce within 5 years of marriage for Malay women who worked is 20.3 percent compared with 11 percent for those who never worked.

PRESENCE OF CHILDREN OR SON

Among the factors affecting the stability of marriage, the most crucial is probably the presence of children.** This is particularly

---

*It is also possible that women, out of necessity, worked after they were divorced.

**The presence of young children however does not seem to deter a Malay women from divorcing. At the time of divorce from first marriage, at least 60 percent of the women with at least one child had an eldest child who was 5 years of age and below.

so since children are highly valued in Malaysia (rf. Chap. 4). The analysis is limited to whether the woman was childless at the time of divorce or had at least one child. In addition, the presence or absence of a son in relation to marital stability is also examined.

From Table 5.15, the probability that a Malay marriage will terminate in divorce within five years of marriage for women with no child is 71.8 percent. The probability that a Malay woman with one child or more will divorce within five years is 6.3 percent. The probability of divorce within five years of marriage for a Malay woman with no son was 22.4 percent compared with 4.4 percent probability of divorce if she had a son. The probability of divorce of a Chinese woman without a son was 3.6 percent compared with 0.2 percent for those with a son. There is apparently very much less importance placed on a woman's success in producing a son than on her success in producing a child. However, divorce may occur soon after marriage making it impossible for a woman to have a child. The interpretation of the results involving childlessness has to take account of the uncertain causal direction of the association between divorce and childlessness.

Multiple classification analysis is next used to estimate the effects of these variables. AID is first used to check for the importance of interaction effects. The probability of divorce is restricted to those occurring within five years of marriage or less as the probability of divorce increases very little after this period. The MCA results will be presented separately only for four marriage cohorts, 1965-69, 1960-64, 1955-59 and 1950-54 and three birth cohorts, 1930-34, 1935-39 and 1940-44, to reduce both selection bias

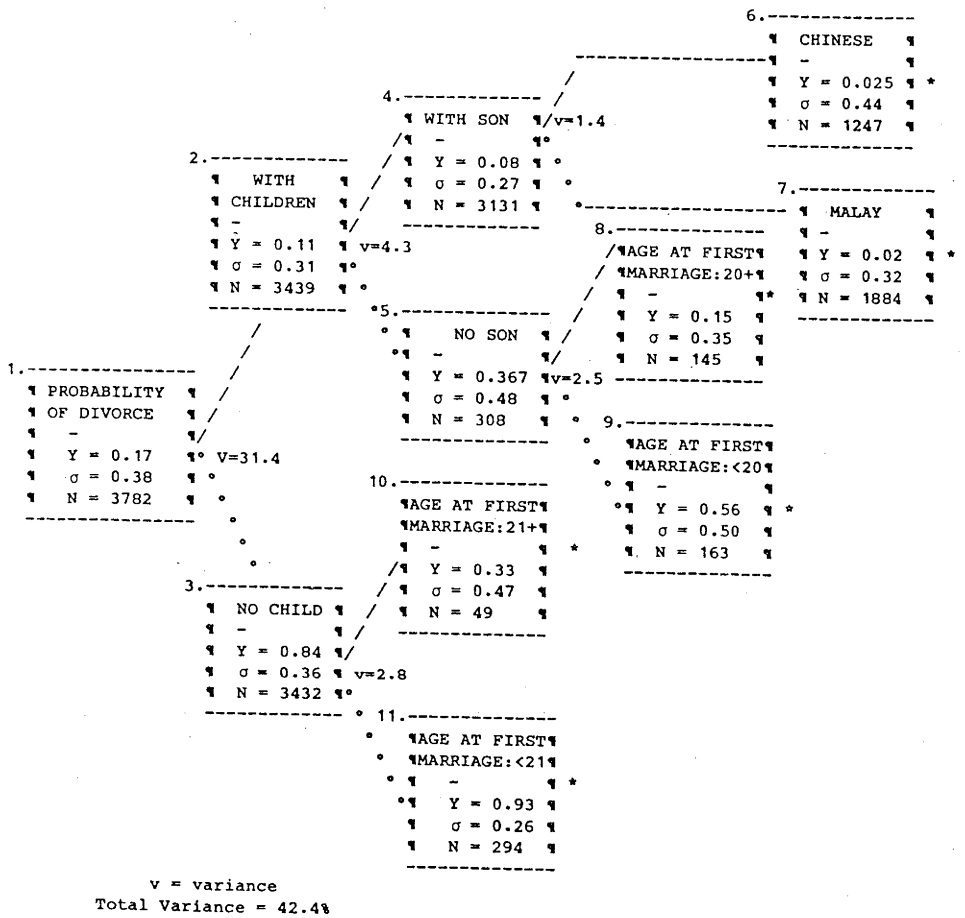


FIGURE 5.5: AID TREE OF BEST SPLITS ON THE PROBABILITY OF DIVORCE WITHIN FIVE YEARS OF MARRIAGE OF TOTAL MALAY AND CHINESE WOMEN AGED 25 YEARS AND OVER, MARRIED BEFORE AGE 25 YEARS, 1974 MFFS

and bias from memory lapse. A woman who is divorced within the five year period is given a code of 1, otherwise it is 0. The sample includes only women aged 25 years and over, who married before 25 years of age, and were married at least five years before the survey and had not been widowed in the period of five years after marriage.

5.3.2. MULTIVARIATE ANALYSES - PROBABILITY OF DIVORCE

Using the criteria given in 5.2.3 for AID analysis, a test for the importance of interaction effects was carried out. Figure 5.5 displays the best splits for the total sample (Malay and Chinese). The independent variables used are age at marriage, education, work experience (ever worked, including those currently working, or never worked), migration status, using the simple definition described earlier, number of children born in the first marriage, differentiating between those with a son and those without a son, and race, Malay or Chinese. The variable, number of children born in the first marriage, emerged as the most important explanatory variable. This variable explained more than 30 percent of the variation in the probability of divorce, but this may simply indicate that women divorced very soon after marriage, making it impossible for them to have any children. Other variables found to be important in the total sample were age at marriage and race. The tree looks somewhat asymmetrical, suggesting the presence of interaction effects. In the AID-search output not shown here, the profile of means and the abrupt changes in the explanatory power of some newly created groups suggest also the presence of interaction effect. Also, the adjusted R^2 from MCA is less than that obtained from AID-search. The analysis of

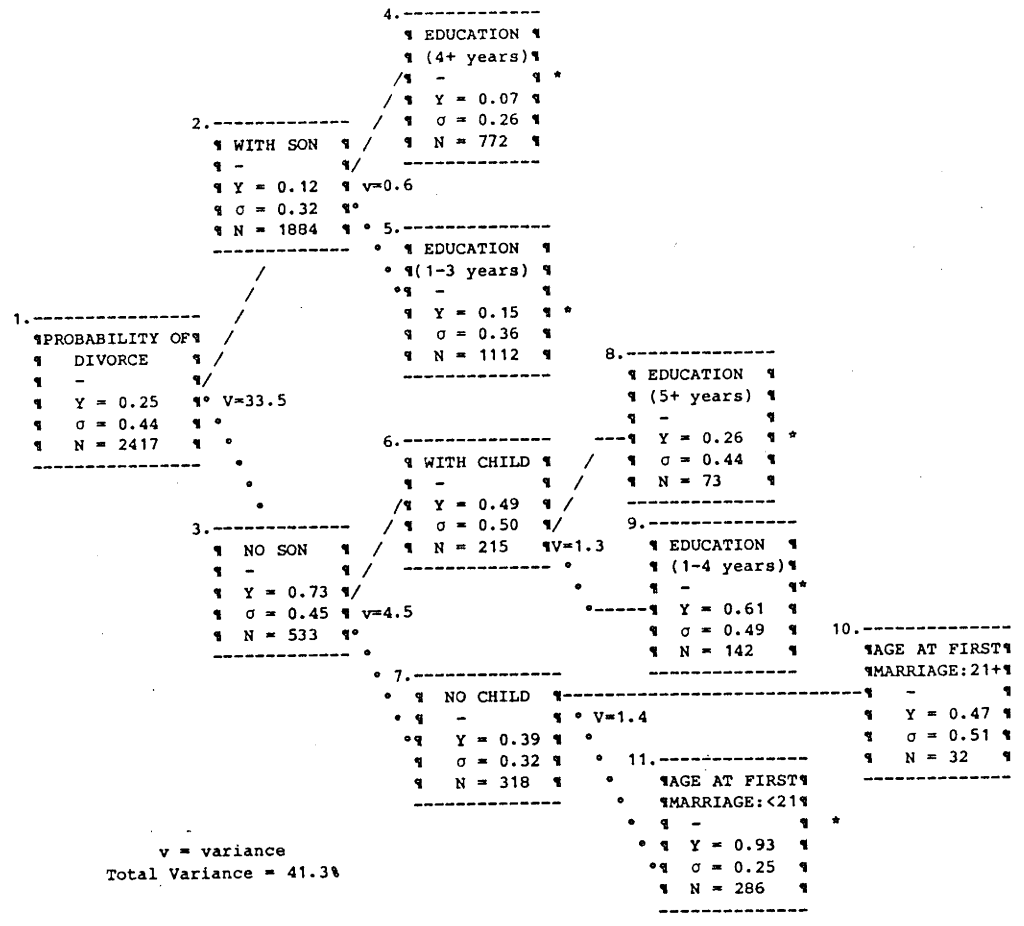


FIGURE 5.6: AID TREE OF BEST SPLITS ON THE PROBABILITY OF DIVORCE WITHIN FIVE YEARS OF MARRIAGE, MALAY WOMEN AGED 25 YEARS AND OVER, MARRIED BEFORE 25 YEARS OF AGE, 1974 MFFS

variance results (not shown) indicate that two-factor interactions are significant and race interacts significantly with almost all the other factors.

A second AID run was carried out for the Malay sample to see whether the interaction effects are reduced; a run was not done for the Chinese sample because the number married more than once is very small. Figure 5.6 displays the best splits for the Malay sample. The same independent variables are used. Apart from the number of children born in the first marriage and age at first marriage, the level of education explains some of the variation in the probability of divorce for women with at least one child. The tree again looks somewhat asymmetrical. The profile of means and the proportion of variation explained by a partition using the variable under consideration (not shown) indicate that the interaction effects are greatly reduced. But the adjusted R^2 from the MCA run is less than that obtained from AID-search.

The analysis of variance results (not shown) indicate that two-factor interactions and three-factor interactions are significant but 4 and 5 factor interactions are not significant at 0.01 level. Closer examination reveals that the only two-factor interactions which are significant at 0.01 level are the interactions between children born in the first marriage and one of the other independent variables. The three factor-interactions which are significant at 0.01 level are age at marriage and children born in the first marriage with (1) migration status and (2) education level. Analysis of variance was therefore repeated using combinations of three factors. Using a combination of the factors, age at marriage (1= less than 18 years, 2=

18+ years), children born in the first marriage (0= no child, 1= 1+

Table 5.17

MCA Results: Probability of Divorce* Within Five Years of Marriage of Malay Women Aged 25 Years and Over, Married Before 25 Years of Age, Married at least 5 Years before the Survey, 1974 MFFS

	N	Unadjusted Dev'n	Eta	Adjusted for Independents Dev'n	Beta
Grand Mean= 0.17					
Work Experience					
Never worked	768	-0.05		-0.01	
Ever-worked (includes currently working)	1649	0.02		0.01	
			0.10		0.02
Migration Status					
Rural non-migrant	1882	0.02		0.00	
Migrants	364	-0.05		0.00	
Urban non-migrants	171	-0.07		-0.02	
			0.08		0.02
New Variable**					
AMAR(1) X EDU(1) X CHILD(1)	176	0.69		0.69	
AMAR(2) X EDU(1) X CHILD(1)	38	0.49		0.49	
AMAR(1) X EDU(2) X CHILD(1)	69	0.62		0.62	
AMAR(2) X EDU(2) X CHILD(1)	35	0.18		0.18	
AMAR(1) X EDU(1) X CHILD(2)	641	-0.07		-0.07	
AMAR(2) X EDU(1) X CHILD(2)	270	-0.07		-0.07	
AMAR(1) X EDU(2) X CHILD(2)	627	-0.09		-0.09	
AMAR(2) X EDU(2) X CHILD(2)	561	-0.12		-0.12	
			0.65		0.64

R^2 = 0.419

* Defined as the number of divorces over total marriages (excludes marriages terminated by widowhood)

** Age at marriage-children born in the first marriage-education
Age at first marriage, AMAR (1) less than 18 years (2) 18+ years
Children born, CHILD (1) no child (2) 1 or more children
Education, EDU (1) none (2) 1 or more years

Dev'n Deviation

children) and education level (0= no education, 1= 1 year or more), the analysis of variance results (not shown) indicate that two-factor and three factor interactions are not significant at 0.01 level. A third AID run was carried out using the newly created variable and it was found that this new variable explained about 34 percent of the variation in the probability of divorce. The above AID results, both the profile of means and the explanatory power as explained earlier, indicate that interaction effects are not important* and work experience is more important than migration status in explaining the variation in the probability of divorce. A re-run of the analysis of variance, assuming the interaction effects to be negligible, showed that all the variables are significant at 0.01 level and the new variable, age at marriage-children born in the first marriage-education level, is the most important variable followed by work experience and lastly migration status.

The MCA results are presented in Table 5.17. It is clearly seen that the effect of the new variable on the probability of divorce is higher for women without children than for those with at least one child. But divorce may take place very soon after marriage before the woman becomes pregnant. The MCA results obtained from a sample excluding women who were divorced within two years after marriage also indicates a higher probability of divorce for women with no children than those with at least one child. Young age at marriage, defined as less than 18 years, in combination with no child has the largest effect on the probability of divorce, followed by no education in combination with no child. For women with at least one child, both education and the age at marriage have not much effect on the

---

*Also, the MCA adjusted R^2 (using the same variables) is greater than the R^2 obtained from the AID run.

Table 5.18

MCA Results: Mean Probability of Divorce Within Five Years of Marriage for Malay Ever-married Women Aged 25 Years and Over who Married before Age 25 Years by the new variable* for Selected Birth and Marriage Cohorts, 1974 MFFS

	(1)	(2)	(3)	(4)	(5)
Marriage Cohorts					
1965-69	0.47	0.00	0.08	0.02	0.05
1960-64	0.69	0.12	0.06	0.10	0.03
1955-59	0.90	0.07	0.09	0.05	0.05
1950-54	0.76	0.05	0.08	0.09	0.02
Birth Cohorts					
1930-34	0.72	0.09	0.06	0.05	0.00
1935-39	0.85	0.07	0.09	0.10	0.06
1940-44	0.82	0.08	0.10	0.05	0.02

*Age at first marriage-Children born in the first marriage-Education
(1) no child
(2) age at marriage less than 18 years, no education, at least 1 child
(3) age at marriage 18 years and over, no education, at least 1 child
(4) age at marriage less than 18 years, with education, at least 1 child
(5) age at marriage 18 years and over, with education, at least 1 child

probability of divorce. An interesting observation is that these effects remain the same even with control for migration status and work experience. Other results indicate that, controlling for other variables, the probability of divorce within five years of marriage was larger for women who had ever worked than for those who had never worked. Further, if other variables are controlled, women who were rural non-migrants and migrants had a higher probability of divorce than urban non-migrants. The MCA results (rf. Appendix 5.4) obtained,

excluding the variable children born in the first marriage, were essentially the same for the other variables.

The MCA results for birth and marriage cohorts are presented in Table 5.18. From the results presented the probability of divorce was higher for women without children than for women with at least one child. There seems to be a declining trend, except for slight fluctuations, in the probability of divorce of women without children from older to younger birth or marriage cohorts. As divorce becomes less frequent at shorter durations, more women would have children. Perhaps reliance on children as a means of old age support is declining over time and therefore the effect of childlessness on divorce is becoming less important. The effects of age at marriage and education on the probability of divorce of women with at least one child do not follow any definite pattern. The effect of age at marriage and education on the probability of divorce of childless women cannot be studied separately for the women in the various cohorts because the numbers are too small.

5.4. CONCLUSION

The main purpose of this chapter was to look at changes over time in the nuptiality behaviour of Malay and Chinese women. Attempts were made to explain the differences in nuptiality patterns. The chapter was divided into two main sections, the first covering age at first marriage and the second the probability of divorce.

In the first section, it was found that age at first marriage is increasing over time and Malay women married earlier than Chinese women. The Coale-McNeil model nuptiality schedule was fitted to the 1974 MFFS data and it was found that the fit was generally good. The mean age at first marriage obtained from this model also indicates a rising trend in age at first marriage. For both Chinese and Malay women, education level was found to be the most significant factor in explaining the variation in age at first marriage. The type of childhood residence was found to be relatively unimportant, particularly for the Chinese women. Work status before marriage, although more important than childhood residence, was not as important as education level in affecting the variation in age at first marriage.

In the second section, it was found that the probability of divorce is declining over time and that Malay women had a higher probability of divorce compared with the Chinese. The probability of divorce was higher the younger the age at marriage but this probability declined the longer the marital duration. Women from urban areas had a lower probability of divorce compared with women from rural areas. Migrants had a probability of divorce that was between these two values. Women with no work experience had a lower probability of divorce than women who had some work experience. Also, excluding women who divorced within two years after marriage, the probability of divorce was very much higher for women with no children compared with women with at least one child. For women with a child, the probability of divorce was higher for women with no sons than women with at least one son. The evidence therefore indicates that great importance is placed on a woman's ability to have a child and

some importance on her ability to have a son.

Appendix 5.1

Mean Age at First Marriage of Malay and Chinese Currently Married Women Aged 25 Years and Over who Married before Age 25 Years by Current Residence, Childhood Residence, Migration Status, Education and Premarital Work Status for Various Birth Cohorts, 1966-67 MFS

Race	Residence				Migration Status			Education			Work Status**			
	Childhood		Current		Non-migrant		Migrants	0	1-6	7+	(1)	(2)	(3)	(4)
	Vill.	Town	Vill.	Town	Vill.	Town								
Malays														
1922-26	16.7	18.6	16.7	18.3	16.6	18.4	18.6	16.9	17.4	*	16.6	17.6	*	17.8
1927-31	15.4	17.6	15.4	17.5	15.4	17.7	16.5	15.4	17.3	*	15.5	15.4	*	16.8
1932-36	16.2	18.2	16.1	18.1	16.1	18.4	17.3	16.0	17.7	*	16.1	16.7	17.3	17.4
1937-41	16.0	19.1	16.1	18.7	15.9	19.1	18.2	16.2	16.9	20.0	16.2	17.1	*	17.3
1922-26	17.6	17.5	17.7	17.4	17.7	17.6	*	17.2	18.1	*	17.7	*	*	*
1927-31	16.8	18.8	16.5	18.4	16.4	*	*	17.0	17.8	*	16.7	*	*	*
1932-36	17.2	19.5	17.6	18.7	17.2	19.1	*	17.3	18.3	*	17.2	*	*	19.2
1937-41	16.9	18.9	16.9	18.1	16.9	18.8	17.0	16.5	17.6	*	17.0	*	*	17.9

Vill. = Village or estate

* less than 30 cases

** premarital work experience
(1) never worked before marriage
(2) at home
(3) partly at home, partly somewhere else
(4) outside the home

Appendix 5.2

Analysis of Variance of Age at First Marriage of Women Aged 25 Years and Over who Married before Age 25 Years, 1974 MFFS

Source of Variation	df	Mean Squares	F	Significance
Main Effects	7	2055.00	272.81	0.000
Race(Malay or Chinese)	1	4552.16	604.33	0.000
Education (EDU)	2	1615.30	214.44	0.000
Work*	3	24.35	3.23	0.072
Residence**	1	259.86	34.50	0.000
Two-way Interactions	17	20.67	2.74	0.000
Race Education	2	39.77	5.28	0.005
Race Work*	3	20.94	2.78	0.096
Race Residence**	1	19.94	2.65	0.048
EDU Work*	6	15.70	2.09	0.125
EDU Residence**	2	8.30	1.10	0.358
Work* Residence**	3	12.91	1.71	0.162
3-way Interactions	17	9.55	1.27	0.203
4-way Interactions	6	13.92	1.85	0.117

* ** Work Status before marriage
Childhood Residence of wife
df degrees of freedom

Appendix 5.3

Analysis of Variance of Age at First Marriage of Women (Malays and Chinese) Aged 25 Years and Over who Married before 25 Years, 1974 MFFS

Source of Variation	df	Mean Squares	F	Significance
Malays				
Main Effects	6	599.13	70.68	0.000
Education**	2	1172.65	138.34	0.000
Residence*	1	38.42	4.53	0.033
Work*	3	171.65	20.25	0.000
Two-way interactions **	11	19.49	2.30	0.008
Education Residence*	2	15.51	1.83	0.161
Education Work*	6	11.61	1.37	0.223
Residence Work*	3	31.92	3.77	0.010
Three-way interactions	6	21.99	2.59	0.035
Chinese				
Main Effects	6	239.93	41.33	0.000
Education**	2	467.84	80.59	0.000
Residence*	1	2.09	0.36	0.549
Work*	3	97.23	16.75	0.000
Two-way interactions	11	2.93	0.51	0.901
Three-way interactions	6	3.90	0.67	0.672

*
**Work Status before marriage
Childhood Residence of wife
df degrees of freedom

Appendix 5.4

MCA Results: Probability of Divorce* Within Five Years of Marriage of Malay Women Aged 25 Years and Over, Married Before 25 Years of Age, Married at least 5 Years before the Survey, 1974 MFFS

	N	Unadjusted Dev'n	Eta	Adjusted for Independents Dev'n	Beta
Grand Mean= 0.17					
Work Experience					
Never worked	732	-0.05		-0.04	
Ever-worked (includes currently working)	1607	0.02		0.02	
			0.10		0.07
Migration Status					
Rural non-migrant	1837	0.01		0.00	
Migrants	341	-0.04		-0.01	
Urban non-migrants	161	-0.07		-0.02	
			0.08		0.02
New Variable**					
AMAR(1) X EDU(1)	817	0.09		0.09	
AMAR(2) X EDU(1)	302	-0.01		-0.01	
AMAR(1) X EDU(2)	696	-0.02		-0.02	
AMAR(2) X EDU(2)	524	-0.11		-0.10	
			0.20		0.19

R^2 = 0.047

* Defined as the number of divorces over total marriages (excludes marriages terminated by widowhood)

** Age at marriage-education
Age at first marriage, AMAR (1) less than 18 years (2) 18+ years
Education, EDU (1) none (2) 1 or more years
Dev'n Deviation

ADDITIONAL NOTES (CHAPTER 5)

Page numbers in brackets at the end of each note refer to the relevant page in the text of the thesis.

Note 1 : It is acknowledged that it may be preferable to base the analyses of trends on the figures in parentheses for birth cohorts, particularly for the Chinese. It was in recognition of this possibility that both sets of figures were provided so that the reader can draw conclusions from either set. However, in the end, the trends are essentially similar in the two sets of figures.
It is also acknowledged that for the marriage cohorts, the age boundary (that is a restriction to women currently aged 25 years and over or 30 years and over) should not have been applied but it is still necessary to apply the restriction of only including marriages occurring below the age of 25 years or 30 years. Retabulation of the figures on this basis present the following results:

Marriage Cohorts	Malays	Chinese
1970-74	19.1 (19.7)*	20.8 (21.9)
1965-69	18.1 (18.7)	20.7 (21.9)
1960-64	17.5 (17.8)	20.4 (21.7)
1955-59	16.7 (16.9)	19.6 (20.3)
1950-54	16.3 (16.4)	19.2 (19.6)

*The figures in parentheses indicate marriages occurring below the age of 30 years.

The results for the recent periods before the survey are lower than those obtained with the age boundary (rf. Table 5.1). This is because the application of the age boundary means that in the recent period before the survey those aged 25+ years who married below the age of 25 years must necessarily be all of age close to 25 years when they married.
It is also acknowledged that the use of the median rather than the mean may have been preferable. The calculation of the median, however, would involve making an assumption about the proportion of women who would ultimately marry.

(pp. 146-148)

Note 2 : It is acknowledged at the end of the paragraph on p. 152 that the use of state groupings has limited interpretation in this context because of differences in development and educational levels, etc. No attempt was made to use multivariate analysis because information on rural-urban composition and education level, for example, are not available for 1974, the year the survey was carried out. Further, some variables, such as economic opportunities, will be hard to quantify.
The Chinese and the Malays have two very distinct marriage patterns. The Chinese generally marry much later than the Malays. It is true that the Chinese marriage pattern is

changing but so is the Malay's. The 'Chinese pattern' here simply refers to a later marriage pattern.
The number of variables that one can work with from survey data are fairly limited. Having discussed the relevance of these variables earlier, it was felt unnecessary to repeat them. The section concentrated more on the results obtained from multivariate techniques. While the use of such techniques may seem to present roughly similar trends of results as cross-tabulation, they do differ. For example, the use of multi-variate techniques allow the effects of certain variables to be estimated, controlling for other variables.
As presented on p. 154, the results from the Coale-McNeil model do add to what one can obtain from cross-tabulation. Firstly, the age at marriage of recent cohorts can be obtained. Secondly, the model does not require the truncation of age at marriage at a certain age. This means that the marriage experience that is past this age need not be excluded and a better estimate can be obtained. (pp. 146-155)

Note 3 : The results of the Coale-McNeil model presented in Smith, Peter C., Mohammed Shahidullah, and Adelamar N. Alcantara (1983), 'Cohort Nuptiality in Asia and the Pacific: An Analysis of WFS Surveys', COMPARATIVE STUDIES (22), are by age groups, using both household and individual data, without subclassification for racial groups. Results by such a classification were not presented in the thesis. (p. 155)

Note 4 : It is agreed that there are some very complicated issues involved with measuring the influence of migration status on behaviour. In the present analysis, it was only possible to use a simplified definition as only information on current residence and childhood residence (i.e. residence upt to the age of 12 years) were available.
From the 1974 MFFS data, it is not known whether many women migrate for the purpose of marriage. On p. 165, in the middle of the second paragraph, it is stated that 'The disadvantage of using this measure is that the period of residence is not available on whether the women migrated before they were married or after they were married'. (pp. 165-166)

Note 5 : Reverse causality between divorce and childlessness was considered and this was presented on the last few lines of the second paragraph on p. 195. (p. 195)

Note 6 : The point is that if a woman's status within the marriage is raised then she is in a better position to influence the course of the marriage instead of having to resort to divorce. (pp. 190-193)

[1]The categories of childhood residence are (i) village, (ii) town, and the categories of work status before marriage are (i) not working, (ii) unpaid family worker, employee, own account worker.
It is stated on p. 178 that the interaction effects were found to be unimportant and hence no substantive interpretation was given to it. (p. 179)

CHAPTER 6

NUPTIALITY BEHAVIOUR AND FERTILITY

There are two aspects of fertility which are of interest to demographers. The first aspect is the quantity or quantum of fertility while the second is the timing or the tempo of fertility.* This chapter concentrates on the quantum of fertility by looking at data from vital statistics as well as censuses, in addition to cross-section data, in an attempt to explain more recent trends. At the end of the chapter, an attempt is made to relate the changes in fertility to changes in nuptiality behaviour. Chapter 7 deals with the tempo of fertility.

6.1. TRENDS IN FERTILITY

A number of studies, such as Jones and Sidhu, 1981a, and Hirschman, 1980, to name only two, have shown that fertility, as measured by the crude birth rate or the total fertility rate, has declined in Peninsular Malaysia since 1957. Declines are evident for all ethnic groups but differences exist between groups. In 1958, according to the total fertility rate, Chinese fertility was higher

---

*See Ryder (1980) for a discussion on the concepts of quantum and tempo.

than Malay fertility.* However, the decline was greater for the Chinese than the Malays such that by 1964 or 1965 the Malay total fertility rate was higher than the Chinese rate (rf. Graph 6.1).

As can be seen in Table 6.1, for the Malay women, from 1958 to 1979, the decline in the fertility rate was sharp for the 15-24 age group. For women in the prime childbearing ages of 25-39, the fertility rate in 1979 was about the same as in 1958. Women in their 40s also have rates that remained essentially the same, unlike the Chinese, where the rates declined sharply. It thus appears that in the recent period Malay women were postponing births to older ages. The fall in the fertility of Malay women in the younger ages was mainly due to the postponement of marriage. For the Chinese women, between 1958 and 1979, a sharp decline in the fertility rate was observed for all age groups. In addition to the effect of marriage postponement, Chinese women seem to be spacing their births at greater intervals and stopping at smaller family sizes than in the past (rf. this chapter and next chapter). In 1958, except for the age groups 15-19 and 20-24, the Chinese fertility rate was higher than the Malay fertility rate. However, in 1979, in all age groups, the Chinese fertility rate was lower than the Malay fertility rate. This is a rather recent phenomenon. If a study of the age specific

---

*Jones and Sidhu (1981a) found that Malay fertility was almost identical to Chinese fertility according to age-sex standardised birth rates. Age-sex standardised birth rates give more weight to the rates in those age groups with more women while total fertility rates (based on the addition of age-specific fertility rates) give equal weight to the rate in each group. In addition, the rates for the late 1970s may be slightly wrong because of inaccuracies in the base population, which tend to become more serious the further one gets from the 1970 Census.

Table 6.1

Age Specific and Total Fertility Rates, 1958-1979, Peninsular Malaysia

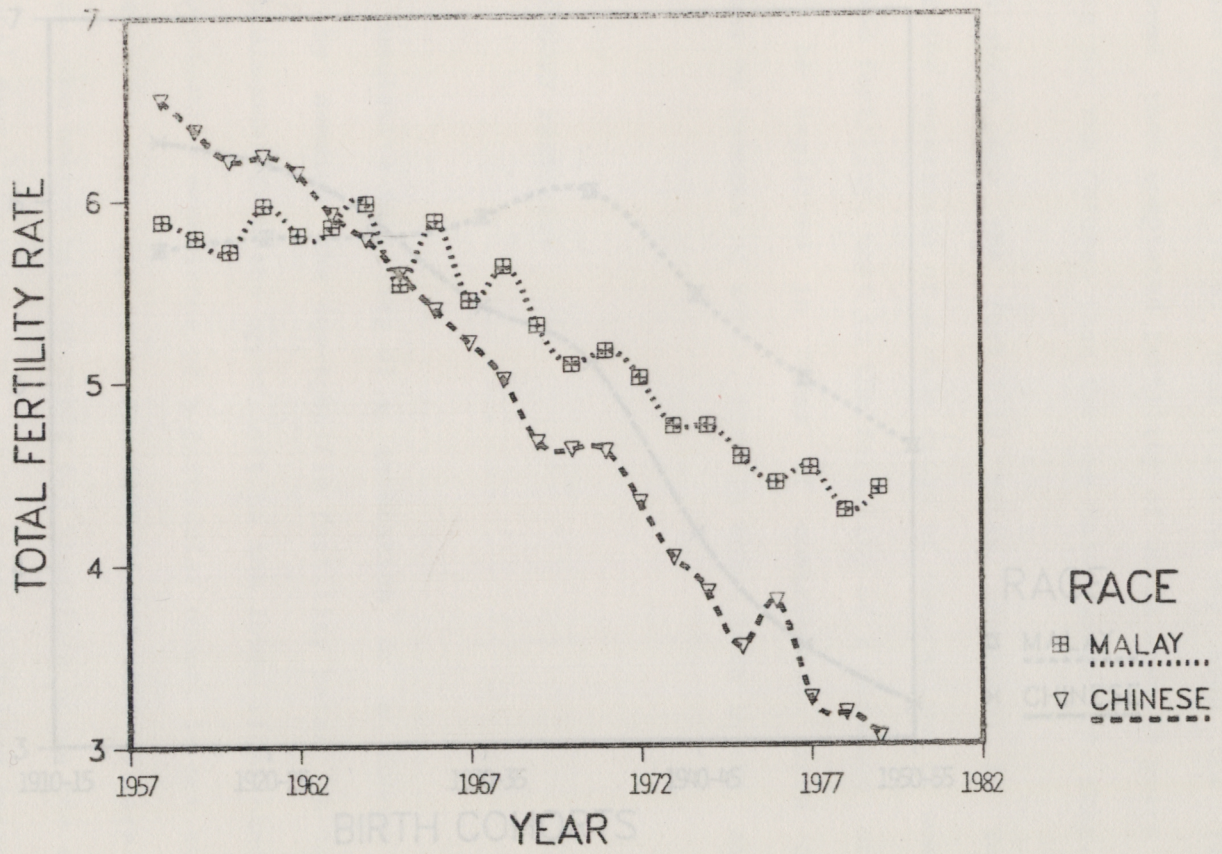
Race/ Age Groups	Year (Age Specific Birth Rates)											Index: 1958=100		
	1958	1967	1971	1972	1973	1974	1975	1976	1977	1978	1979	1971	1974	1979
Malays														
15-19	173.3	90.0	70.1	66.4	61.4	60.3	44.8	52.8	50.5	44.8	42.0	40	35	24
20-24	333.5	267.3	242.4	228.4	216.9	218.2	212.1	202.3	196.1	188.3	187.8	73	65	56
25-29	277.3	268.1	264.4	262.6	245.4	242.2	241.9	234.2	234.0	229.8	235.3	95	87	85
30-34	202.1	240.7	223.8	214.2	203.2	209.2	200.0	196.9	206.5	191.1	202.2	111	104	100
35-39	131.2	150.0	156.8	161.6	158.1	155.2	149.6	137.9	144.6	133.8	143.7	120	118	110
40-44	43.2	54.9	60.2	56.7	52.2	53.2	56.6	54.3	63.3	61.7	62.5	139	123	145
45-49	15.8	17.4	15.5	12.8	12.6	12.0	11.2	9.2	8.8	7.2	7.7	98	76	49
TFR	5882	5443	5166	5014	4749	4752	4580	4438	4519	4284	4406	88	81	75
Chinese														
15-19	42.3	29.4	24.8	24.0	22.9	25.2	24.5	25.7	24.2	23.3	22.3	59	60	53
20-24	260.7	202.8	186.3	170.9	160.1	158.5	141.6	157.2	139.7	137.8	133.6	71	54	51
25-29	359.0	317.9	274.3	259.4	243.2	236.5	231.4	250.0	211.1	209.3	201.9	76	66	56
30-34	303.9	242.2	230.7	225.3	214.5	196.0	170.4	181.9	156.2	153.6	151.6	76	64	50
35-39	213.7	161.1	140.1	123.9	111.4	104.0	97.1	101.6	87.4	82.7	72.9	66	49	34
40-44	104.7	71.4	56.1	52.8	45.6	41.1	36.6	36.1	28.2	24.0	22.4	54	39	21
45-49	25.0	17.2	10.6	9.5	7.5	6.1	5.9	5.0	3.9	4.1	3.1	42	24	12
TFR	6546	5210	4615	4329	4026	3838	3538	3788	3253	3174	3039	71	59	46
Total Population														
15-19	126.5	68.4	52.9	50.0	46.6	47.0	46.9	42.9	41.2	37.4	35.6	42	37	28
20-24	313.7	247.5	223.1	208.0	196.5	196.8	186.4	187.0	176.7	171.3	169.1	71	63	54
25-29	312.9	292.3	265.7	259.3	243.0	239.5	237.8	240.1	223,5	220.4	220.9	85	77	71
30-34	239.3	241.1	221.9	215.1	204.0	200.7	183.3	185.4	180.0	170.6	175.7	93	84	73
35-39	159.4	153.3	145.6	140.8	134.0	129.8	123.4	118.1	116.2	108.2	109.2	91	81	69
40-44	66.4	59.4	56.7	53.3	47.4	45.8	45.9	44.0	45.9	43.3	43.4	85	69	65
45-49	19.2	16.8	13.3	11.3	10.4	9.4	8.8	7.4	6.5	5.6	5.4	69	49	28
TFR	6187	5394	4895	4689	4410	4345	4162	4124	3949	3784	3797	79	70	61

TFR = total fertility rate

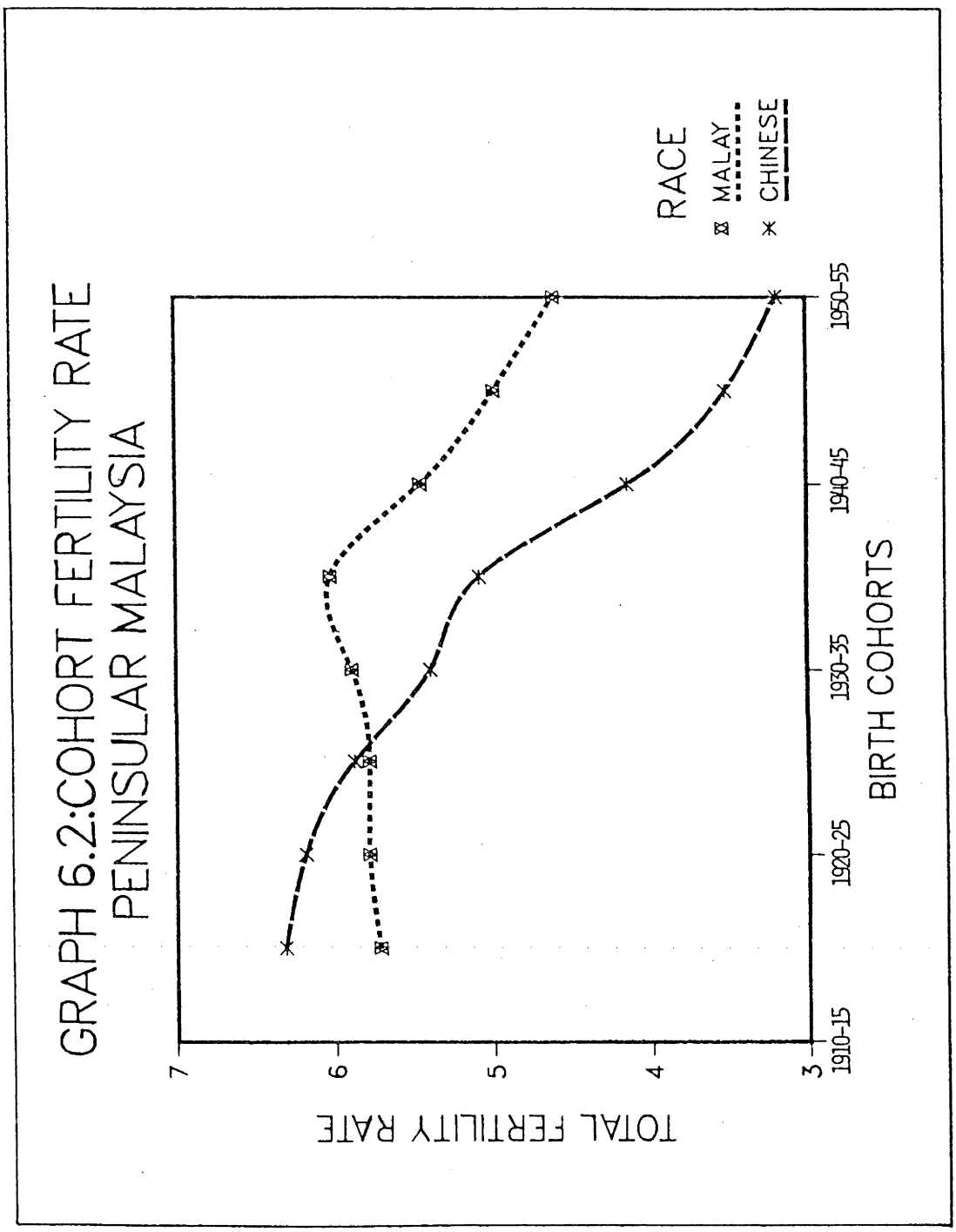
Note: (1) Population figures used are adjusted mid-year populations; (2) Birth figures are live births based upon place of occurrence, rather than usual residence of mother. The figures based on place of occurrence differ only slightly from those based on place of usual residence; (3) Births to women below age 15 years and above age 49 years have been assigned to the 15-19 and 45-49 age of mother categories, respectively. Births to women of an unknown age have been distributed proportionately according to the distribution of births of the known age population.

Source: Figures (1958-77) computed from data compiled by Dr. Charles Hirschman (1980), Department of Sociology, Duke University, from Vital Statistics publications, Dept. of Statistics. Other figures from Vital Statistics publications.

GRAPH 6.6 PERIOD FERTILITY RATE 1958–1979
PENINSULAR MALAYSIA



SOURCE: VITAL STATISTICS


GRAPH 6.2:COHORT FERTILITY RATE
PENINSULAR MALAYSIA
RACE
MALAY
CHINESE
TOTAL FERTILITY RATE
7
6
5
4
3
1910-15
1920-25
1930-35
1940-45
1950-55
BIRTH COHORTS

fertility rates (as given in Table 6.1) is carried out, it is clearly seen that this pattern only started emerging in the early 1970s and only became obvious in 1976. This explains why even the 1974 MFFS data showed that completed fertility of women aged 45 years and over was higher for the Chinese than for the Malay women (rf. Chap. 2).

In a given year the fertility rates presented in Table 6.1 represent the experience of a wide range of generations of women. The time period fertility, that is the fertility of a sequence of years, needs to be explained in terms of contribution from different generations or cohorts of women, that is women born in the same year or years.

6.1.1. COHORT FERTILITY

The cumulative fertility of a generation or a cohort can be obtained by summing the age-specific fertility rates in Table 6.2 along the diagonal from the upper left to the lower right hand corner. Where reproductive experience of a particular cohort is not available, the age specific fertility rates for 1958-62 and 1978-79 are assumed to apply. The bottom half of Table 6.2 therefore shows the estimated cohort total fertility rate. The cohort total fertility rates for all women and Chinese women only show a declining trend from older to younger birth cohorts. The cohort total fertility rate for the Malay women shows an increasing trend from the 1915-20 birth cohort to the 1935-40 birth cohort but declines thereafter. The Malay birth

Table 6.2

Period and Cohort Fertility Rates,* Peninsular Malaysia

Race/ Period	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Period TFR(a)
Malays								
1958-62	133.0	325.2	271.0	211.2	135.2	48.6	12.1	5682
1963-67	107.8	283.6	294.4	230.7	146.7	63.1	19.3	5728
1968-72	74.1	243.9	263.0	234.0	154.0	59.1	18.2	5232
1973-77	53.7	208.6	239.2	203.1	148.9	56.1	10.7	4602
1978-79	43.4	188.1	232.7	198.1	138.7	62.1	7.5	4353
Chinese								
1958-62	36.4	250.3	348.2	301.4	204.9	101.0	18.2	6302
1963-67	30.3	221.4	378.1	266.0	174.7	83.0	20.0	5868
1968-72	25.4	183.8	283.6	225.8	137.8	58.6	12.6	4638
1973-77	24.5	151.1	233.9	182.7	100.1	37.2	5.6	3676
1978-79	22.8	135.7	205.5	152.6	77.7	23.2	3.1	3103
Total Population								
1958-62	116.0	306.1	307.6	244.8	159.4	66.7	14.4	6075
1963-67	79.6	265.7	308.0	246.1	156.0	68.6	18.9	5715
1968-72	56.0	223.7	270.9	227.7	143.8	69.5	15.6	5036
1973-77	44.8	188.3	236.3	190.2	124.1	45.8	8.4	4190
1978-79	36.5	170.2	220.7	173.2	108.7	43.3	5.5	3791

Birth Cohort(b)	1915-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55
Cohort TFR(a)								
Malays	5718	5785	5785	5888	6026	5455	4987	4609
Chinese	6311	6184	5876	5395	5085	4141	3523	3193
Total Population	6098	6091	6042	5856	5654	5002	4352	3979
Index: 1915-20=100								
Malays	100	101	101	103	105	95	87	81
Chinese	100	98	93	85	81	66	56	51
Total Population	100	100	99	96	93	82	71	65

(a) TFR =Total Fertility Rate
(b) Approximation only

Note: The age specific fertility rates for 1958-62 and 1978-79 are assumed to apply
* where reproductive experience of a particular cohort is not available.
Source is the same as Table 6.1.

cohorts of 1915-20, 1920-25 and 1925-30, had lower fertility than the respective Chinese cohorts. From the 1930-35 birth cohort, however, Malay fertility was higher than Chinese fertility. The changes in fertility level may be partly exPlained by the fact that the National Family planning Programme was introduced in 1967. After 1967, methods of modern contraception became more widely available. But not much was done in the rural areas in the early years since the programme started in the cities. The birth cohorts of 1915-20, 1920-25 and 1925-30 had almost, if not entirely, completed fertility by 1967. The birth cohorts of 1930-35 and later cohorts were exposed to the programmes at various periods after marriage. The Chinese, being more urban and educated, were probably more affected by the programmes effects than the Malays. The effect of contraception will be examined in more detail later.

Comparing fertility at various ages by cohorts of women indicates that for both the Malay and Chinese women, a greater proportion of completed fertility is achieved before the age of 30 years than after the age of 30 years (rf. Table 6.3). Chinese women as compared with Malay women achieved a lower proportion of completed fertility at the age of 25 years mainly because they married later than the Malay women. From the age of 30 years onwards however, the Chinese women had achieved a higher proportion of completed fertility than the Malay women. For example, at the age of 40 years, the Chinese women had achieved about 96 percent of completed fertility compared with about 93 percent for the Malay women. Malay women of the 1935-40 and

Table 6.3

Birth Cohorts	Cumulative Cohort Fertility**									
	Cumulative Fertility (per 1000 women) at age					Percent of Total TFR at age				
	25	30	35	40	50	25	30	35	40	
Malay										
1915-20	*	*	*	*	5718	*	*	*	*	
1920-25	*	*	*	5378	5785	*	*	*	93	
1925-30	*	*	4760	5436	5785	*	*	82	94	
1930-35	*	3646	4838	5570	5888	*	62	82	95	
1935-40	2291	3763	4908	5678	6026	38	62	81	94	
1940-45	2083	3398	4362	5107	5455	38	62	80	94	
1945-50	1759	2955	3945	4639	4987	35	59	79	93	
1950-55	1414	2577	3567	4261	4609	31	56	77	92	
Chinese										
1915-20	*	*	*	*	6311	*	*	*	*	
1920-25	*	*	*	5706	6184	*	*	*	92	
1925-30	*	*	4530	5555	5876	*	*	77	95	
1930-35	*	3175	4320	5194	5395	*	59	80	96	
1935-40	1434	3324	4265	4954	5085	28	65	84	97	
1940-45	1289	2707	3508	4009	4141	31	65	85	97	
1945-50	1071	2240	3003	3392	3523	30	64	85	96	
1950-55	883	1910	2674	3062	3193	28	60	84	96	

TFR = Total Fertility Rate

ASFR = Age Specific Fertility Rate

** The assumption used is similar to Table 6.2. See note at the end of Table 6.2.

*Rates not shown because all the age specific rates up to the age indicated are not those of the cohorts concerned. If at least one of the ASFRs used is that of the cohort concerned, the rate is calculated.

Source: Figures estimated from Table 6.2

Table 6.4

Cumulative Percent of Births by Selected Ages by Birth Order of Malay and Chinese Women

	Year/Cumulative Percentage of Births at Age								
	1964			1975			1979		
	20	25	30	20	25	30	20	25	30
First Order Birth									
Malays	47.8	82.4	93.9	30.9	78.5	95.0	22.6	70.8	92.9
Chinese	16.1	68.7	93.8	15.5	61.6	91.4	12.8	57.2	89.1
Second Birth Order									
Malays	28.1	73.5	91.2	12.4	64.4	90.7	8.7	55.3	88.6
Chinese	6.2	55.6	81.9	4.5	43.1	83.7	4.0	38.8	79.7
Third Birth Order									
Malays	9.6	56.6	73.1	2.5	41.9	81.7	1.9	34.0	77.6
Chinese	2.0	41.6	83.1	1.0	24.7	71.4	0.9	21.7	66.3

Source: 1964, 1975 and 1979 Vital Statistics publication

1950-55 cohorts achieved on average 34 percent of completed fertility by age 25 years and 33 percent between the ages of 30 to 40 years. Chinese women from the same cohorts achieved on average 29 percent of completed fertility by age 25 years and 38 percent between the ages of 30 and 40 years. If comparison is made across cohorts, it is clearly seen that each subsequent cohort achieved a lower proportion of completed fertility before the age of 30 years. This is particularly true for the cohorts of 1940-45 to 1955-60. Women in Peninsular Malaysia were therefore not only postponing marriage but also postponing births. While this is happening period fertility will fall below cohort fertility. For example, the period fertility of 1969-79 of both Malay and Chinese women was less than the respective cohort fertility of 1940-45 (rf. Graphs 6.1 and 6.2).

The shift in childbearing to older ages is partly responsible for the lower level of recent period fertility. The younger cohorts show a trend in this direction but as with the older cohorts, more than 90 percent of childbearing seems to be completed by the age of 40 years. If successive cohorts of women gradually concentrate more of their births into an increasingly shorter span of their reproductive years, without reducing appreciably the completed family size,* the time period fertility level would rise above the underlying cohort fertility level. This would create a misleading impression of a strong swing towards a larger family size. Likewise, the shift in childbearing to older ages, which is currently taking place, gives the impression that family size has contracted considerably, particularly for the Chinese. The only cohort that has almost complete information

---

*As yet, it is difficult to predict by how much family size would be reduced.

on its reproductive experience, that is the 1940-45 birth cohort, indicates that Malay women, on average, have about 5 children while Chinese women have about 4 children. The 1978-79 period fertility level indicates about 4 children for the Malay women and 3 children for the Chinese women. The cohorts of women born in 1945-50 and 1950-55, reaching the age of 30 years in 1975-85, are likely to end their childbearing with about 3200-3500 births per 1000 women for the Chinese and 4600-5000 births per 1000 women for the Malays (rf. Table 6.3): in other words, still above recent period fertility levels.

The time period fertility level is largely dependent on the age pattern and the timing of births, which in turn is influenced by changes in marriage patterns. In the last chapter and in Chapter 2, the changes in marriage patterns were looked at. The timing of births will be examined in the next chapter. It is pertinent to point out that a greater proportion of Malay than of Chinese women had their first, second and third child before the age of 25 years (rf. Table 6.4). Over time, for both the Malay and Chinese women, there was a shift towards having a first, second or third child at an older age. For example (rf. Table 6.4), in 1964, 48 percent of the Malay women had a first birth by age 20 years and 82 percent by 25 years. In 1979, only 23 percent and 71 percent of Malay women had a first birth at 20 and 25 years respectively. From the vital statistics on live birth order it is observed that the percentage of high order births in a single year is falling over time. For example, in 1964 about 37 percent of the births to Malay women were fifth or higher order births but this had fallen to 27 percent in 1979. In 1964, 42 percent of the births of Chinese women were fifth or higher order live births but in 1979, this percentage had fallen to only 14 percent.

6.2. DETERMINANTS OF FERTILITY

In Chapter 2, the results indicated that age at first marriage is negatively related to the fertility level. Also, women married more than once generally have fewer children than women married only once. It was also found that generally a positive relationship exists between fertility and the age difference between spouses.

DaVanzo and Haaga (1982) using data from the 1976-77 Malaysian Family Life Survey (MFLS)** found that for each parity or time period examined, duration of amenorrhoea was shorter for the Chinese than for the Malays. For all groups including the Indians duration of amenorrhoea was generally positively related to birth order. Their study also indicates that breastfeeding, an important determinant of post-partum amenorrhoea, was more common and longer for Malays but was shorter and less common for Indian and Chinese women. Results from the 1976-77 Survey also indicate that breastfeeding duration has declined over time especially for the first child and particularly for the Chinese and Indians. Results from the 1974 MFFS (rf. Chander

---

** For more information about the MFLS, see Butz and DaVanzo (1978). Haaga (1982) has shown that in this survey there was very strong digital preference in the answers on duration of breastfeeding and amenorrhoea, with a tendency to choose answers that were multiples of six months. This was strongest among the Malays and the less educated and in births occurring in the earlier years covered by the survey. These biases may exaggerate the ethnic differences and trends over time toward shorter breastfeeding and shorter periods of amenorrhoea (DaVanzo and Haaga, 1982:375).

et al. , 1977:162-168)* also seem to support this evidence.

The DaVanzo and Haaga (1982:385-386) study also showed an increase over time since 1960 in the length of the menstruating interval, the number of months between the resumption of menstruation following a pregnancy outcome and the next conception or menopause, except for Malays at low parities and Indians at high parities.[1] Also, generally, since 1965, the length of the menstruating interval was positively related to birth order. These patterns were, however, more obvious for Chinese than Malays.

Evidence (from DaVanzo and Haaga, 1982:386-387) on contraceptive use indicates that Malays were more likely than the Chinese women to be practising contraception, mostly traditional methods such as safe period (rhythm), abstinence, withdrawal and folk methods, in the early periods before 1965. However, after 1965, the contraceptive use rate was higher for the Chinese women (a finding which seems to be supported by the 1974 MFFS data).

DaVanzo and Butz (1981:10-12) also using the MFLS data showed that women were more likely to practise more effective methods of contraception when they wanted no more children. They also found that a woman's postpartum amenorrhoea and her menstruating interval tended to be shorter if the child had died, mothers who earned high wages tend to breastfeed less and socioeconomic changes such as increasing education, income and urbanisation encouraged contraceptive use but reduced breastfeeding. Proximity to clinics was also found to

---

*In this survey breastfeeding duration was collected only for the last closed and open interval. Rodriguez and Hobcraft (1980:36), using Colombian data, have shown that estimated intervals from such data tend to be longer than the average closed interval and the bias exists even if the analysis is restricted to intervals started in the recent past, that is 3 to 5 years before the survey. Also, Ferry (1981) has questioned the reliability of the Malaysian breastfeeding data.

Table 6.5

Mean Number of Children Ever Born by Age at First Marriage for Malay and Chinese Ever Married Women Aged 25 Years and Over who married before Age 25 Years by Various Characteristics, 1974 MFFS

	Race/Age at Marriage							
	Malays				Chinese			
	lt 17	17,18	19,20	21-24	lt 17	17,18	19,20	21-24
Contraceptive Use Status								
Never Used	5.3	5.1	4.4	3.3	6.1	6.2	5.1	3.8
	(5.8)	(5.2)	(4.5)	(3.8)	(6.1)	(6.3)	(5.2)	(4.2)
Ever Used	6.3	5.9	5.1	3.4	7.6	6.7	5.5	3.8
	(6.5)	(5.9)	(5.0)	(3.9)	(7.7)	(6.7)	(5.5)	(4.3)
Education Level								
No education	5.7	5.9	5.3	4.4	7.5	6.8	6.0	4.9
	(6.2)	(6.1)	(5.5)	(4.8)	(7.4)	(6.9)	(6.1)	(5.2)
With education	5.5	5.0	4.2	2.9	6.3	6.2	4.9	3.4
	(5.8)	(5.2)	(4.2)	(3.5)	(6.5)	(6.2)	(4.9)	(3.9)
Work Experience								
Never worked	6.0	5.5	4.4	3.0	6.6	6.7	5.6	4.1
	(6.3)	(5.6)	(4.3)	(3.7)	(7.0)	(6.8)	(5.6)	(4.3)
Ever worked (includes currently working)	5.5	5.3	4.8	3.5	7.1	6.5	5.3	3.7
	(5.9)	(5.5)	(4.9)	(3.9)	(7.1)	(6.5)	(5.3)	(4.3)
Migration Status								
Migrant	5.6	5.7	4.3	3.2	7.2	6.6	5.4	3.9
	(6.2)	(5.9)	(4.4)	(4.0)	(7.4)	(6.6)	(5.4)	(4.4)
Non-migrant								
Town	5.9	5.2	4.4	2.4	6.3	6.4	4.8	3.2
	(6.6)	(5.1)	(*)	(2.7)	(6.5)	(6.4)	(4.9)	(3.7)
Rural	5.6	5.4	4.8	3.5	7.2	6.5	5.9	4.3
	(5.9)	(5.5)	(4.8)	(4.0)	(7.0)	(6.6)	(5.9)	(4.8)
Current Residence								
Metropolitan or small town	5.7	5.4	4.4	3.4	6.7	6.4	5.1	3.9
	(6.3)	(5.6)	(4.5)	(3.5)	(6.8)	(6.4)	(5.1)	(3.9)
Rural area	5.6	5.4	4.7	3.7	7.4	6.7	5.7	4.7
	(6.0)	(5.5)	(4.8)	(4.0)	(7.3)	(6.7)	(5.8)	(4.7)
Childhood Residence								
Town	5.8	5.5	4.2	2.6	6.8	6.7	5.0	3.4
	(6.5)	(5.6)	(4.1)	(3.0)	(7.1)	(6.7)	(5.1)	(4.0)
Village or estate	5.6	5.4	4.7	3.5	7.1	6.4	5.7	4.1
	(5.9)	(5.5)	(4.8)	(4.1)	(7.0)	(6.5)	(5.7)	(4.6)

( ) figures are for women married for 5 years or more and married once
* less than 30 cases
lt less than

encourage the use of contraceptives and the use of some traditional methods were found to be associated with significantly longer menstruating intervals, other variables being held constant (DaVanzo and Butz, 1981:10-14). However, their study found no support for the relationship between a woman's likelihood to breastfeed and the availability and price of infant formula. The authors concluded that the decline in breastfeeding is more likely to be associated with nonagricultural work opportunities and other socioeconomic changes since the decline in breastfeeding began well before the introduction of wide-scale commercial sale of infant formula.

No attempt is made to relate the macro changes in fertility to the changes in age at first marriage as there are no vital statistics on all marriages. In this section an attempt is made to look for some determinants of fertility using cross-sectional data. Two basic fertility measures are used; the number of children ever born and DRAT* or duration ratio, Boulier and Rosenzweig's measure of fertility as described in Chap. 3. In addition, an estimate of completed fertility is obtained from the question asking women whether they want to have any more children.[2]

---

*DRAT is the number of children ever born to a woman divided by her predicted cumulative fertility based upon her age at marriage and an age-specific natural fertility schedule. This measure of fertility incorporates biological mechanisms and allows for use of regression and other methods without the need for sample stratification.

6.2.1. DIFFERENTIALS IN FERTILITY

Using the mean number of children ever born (CEB) as a measure of fertility, evidence from the 1974 MFFS indicates that the negative relationship between age at first marriage and fertility holds even with control for other socio-economic characteristics (rf. Table 6.5).* In all sub-categories, Chinese mean CEB remains higher than Malay mean CEB. The mean CEB of women within age at first marriage categories by various characteristics also follows the expected pattern:

(1) Women with no education had more children than women with education;
(2) Women in the rural areas generally had more children than women living in metropolitan or small town areas;
(3) Women who had never worked had more children than women who had ever-worked, including women currently working;
(4) Women still in first marriages had more children than women in higher order marriages.

The use of the duration ratio or DRAT, which takes into account the duration of marriage, as a measure of fertility indicates no definite relationship between age at first marriage and fertility (rf. Table 6.6).[3] In almost all sub-categories, the Chinese fertility

---

*It may be argued that women who marry at young ages tend to be older women who would have higher fertility. In Chapter 2, it was shown that a negative relationship between age at first marriage and fertility exists even with control for years since first marriage. The number of cases available does not allow for this additional control using cross-tabulation.

Table 6.6

Duration Ratio or DRAT (Boulier and Rosenzweig's Measure of Fertility) for Malay and Chinese Ever Married Women Aged 25 Years and Over who Married before Age 25 Years and who have Married for at least 5 Years by Various Characteristics, 1974 MFFS

	Race/ Age at First Marriage									
	Malays					Chinese				
	lt 17	17,18	19,20	21,22	23,24	lt 17	17,18	19,20	21,22	23,24
Current Residence										
Metropolitan or small towns	0.6	0.7	0.7	0.7	0.6	0.7	0.8	0.8	0.8	0.8
Rural areas	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9	1.0	0.9
Work Experience										
Never- worked	0.7	0.8	0.8	0.8	0.6	0.7	0.8	0.8	0.8	0.9
Ever-worked (includes currently working)	0.6	0.7	0.7	0.8	0.8	0.7	0.8	0.8	0.9	0.8
Education Level										
No education	0.6	0.7	0.8	0.8	*	0.8	0.8	0.8	0.9	0.9
With education	0.7	0.8	0.8	0.8	0.8	0.7	0.9	0.8	0.9	0.8
Marital Status										
Currently Married (first marriage)	0.8	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.9	0.9
Not First Marriage (married + not currently married)	0.6	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.8	0.7

* less than 30 cases
lt less than

as estimated by DRAT was higher than the Malay fertility.

For the Malay and Chinese women, the use of the mean CEB of women aged 40 years and over* and women aged 45 years and over as a measure of completed fertility does not allow control for more than one characteristic because of the small sample size. The differentials in completed fertility of the Malay and Chinese women are therefore examined using a single control each time. For the same reason, the mean CEB of women who said they want no more children is only controlled for a single characteristic each time. Tables 6.7 and 6.8 present the different measures of completed fertility by various characteristics. In Table 6.7, in a number of sub-categories, the values of completed fertility for women aged 45 years and over are less than the values of completed fertility of women aged 40 years and over. This may indicate a greater omission of births by women aged 45 years and over at the time of the survey and/ or misplacement of births (rf. Masitah, 1982:27). However, as mentioned in Chap. 2, there was possibly an increase in the average fertility of women in the younger age group due to the making up of births after the Second World War and earlier than usual family formation as a result of the Korean War rubber boom. Other observations from Tables 6.7 and 6.8 are as follows:

(1) Malay women who had never worked had higher completed fertility than women who had ever worked. The values of the duration ratio or DRAT, which takes account of age and marriage duration, indicate no difference or slight differences across the two groups. Estimated completed fertility for the Chinese women by

---

*From the 1974 MFFS data, about 86 percent of the Malay women and 98 percent of Chinese women aged 40 years and over reported that they want no more children.

work status in Table 6.8 is similar to that for the Malays but in Table 6.7 a reverse trend is found. In Table 6.7, women who had ever worked had on average higher completed fertility than those who never worked. The values as indicated by DRAT are also marginally higher for women who had ever worked. This measure of work status is severely limited by the fact that it does not measure the amount of work or the length of time a woman worked and whether the work was compatible with child rearing. Perhaps another reason for the negligible difference in the mean fertility of women of different work experience is because house help and relatives were usually available to assist in the care of children and it was possible for a woman to have children as well as to work. Also, children were greatly valued as security for old age and as a form of investment (rf. Chap. 4).[4] Work experience therefore has a small or negligible effect on fertility.

(2) From Table 6.7, completed fertility was higher for Malay women with at least one year of education than those who were uneducated. Table 6.8 indicates the reverse to be true. It is possible that there was some under-reporting of live births by uneducated older women. The values of the duration ratio indicate no difference or slight differences across the two categories. For the Chinese women, those with no education have a higher level of completed fertility than those with some education. The values of DRAT are roughly similar for the two groups. One can conclude that the classification of education into two groups, that is those with education and those without, has a small or negligible effect on completed fertility. The

Table 6.7

Completed Fertility (mean children ever born and duration ratio of women aged 40 years and over and aged 45 years and over) of Malay and Chinese Ever Married Women by Various Characteristics, 1974 MFFS

	Age GE 40				Age GE 45			
	CEB		DRAT		CEB		DRAT	
	Malays	Chinese	Malays	Chinese	Malays	Chinese	Malays	Chinese
Work Experience								
Never worked	6.3	6.1	0.6	0.7	5.9	6.5	0.6	0.7
Ever-worked (includes currently working)	5.9	6.5	0.6	0.8	5.8	7.0	0.6	0.8
Education Level								
No education	5.9	7.0	0.6	0.8	5.8	7.3	0.6	0.8
With education	6.2	5.7	0.6	0.7	5.9	6.4	0.6	0.7
Marital Status								
First Marriage (currently married)	7.5	6.7	0.8	0.8	7.2	7.5	0.6	0.8
Not First Marriage (married + currently not married)	5.6	5.9	0.6	0.7	5.6	6.4	0.5	0.7
Current Residence								
Metropolitan or small towns	5.5	5.9	0.6	0.7	5.2	6.3	0.5	0.7
Rural areas	6.1	7.1	0.6	0.8	5.9	7.8	0.6	0.8
Age at First Marriage								
Less than 17	6.0	7.3	0.6	0.7	5.7	7.7	0.5	0.7
17,18	6.5	7.7	0.7	0.8	6.6	8.0	0.6	0.8
19,20	6.4	6.7	0.7	0.8	6.1	7.0	0.7	0.8
21,22	5.5	6.3	0.9	0.8	*	6.6	*	0.8
23,24	*	5.0	*	0.7	*	*	*	*
25+	2.8	3.7	0.5	0.8	*	*	*	*
Contraceptive Use Status								
Ever-used 1 method	7.5	6.7	0.8	0.8	7.2	7.4	0.8	0.8
Never used	5.6	5.9	0.6	0.7	5.6	6.4	0.6	0.7

* less than 30 cases

CEB = children ever born; DRAT = duration ratio; GE = greater or equal to

Note: Duration ratio or DRAT is not calculated for women married for less than 5 years.

Table 6.8

Completed Fertility (mean children ever born and duration ratio of women who said they want no more children) of Malay and Chinese Ever-married Women Aged 15-49 Years by Various Characteristics, 1974 MFFS**

	Children Ever Born		Duration Ratio	
	Malays	Chinese	Malays	Chinese
Marital Status				
Currently Married (First Marriage)	6.3	5.5	0.8	0.9
Not first Marriage (married + not currently married)	4.6	5.2	0.6	0.6
Work Experience				
Never-worked	6.0	5.6	0.8	0.8
Ever-worked (includes currently working)	5.5	5.5	0.7	0.8
Education Level				
None	6.0	6.4	0.7	0.9
With education	5.3	4.9	0.8	0.8
Current Residence				
Metropolitan or small towns	5.4	5.1	0.7	0.8
Rural areas	5.7	6.0	0.7	0.9
Age at First Marriage				
Less than 17	6.1	6.9	0.7	0.7
17,18	5.9	6.7	0.8	0.9
19,20	5.2	5.7	0.8	0.8
21,22	4.4	5.0	0.8	0.9
23,24	3.7	4.2	0.8	0.8
25+	2.9	3.5	0.7	0.9
Contraceptive Use Status				
Ever-used 1 method	6.4	5.5	0.9	0.9
Never-used	5.3	5.5	0.7	0.7

*less than 30 cases

See note at end of Table 6.7

effect of education on fertility will probably be higher if a distinction is made between those with different years of education. However, the number of women with more than 6 years of education was relatively small, particularly among the Malay women, and so the education category was not further subclassified.

(3) Women married more than once consistently show a lower level of completed fertility than women still in their first marriage.

(4) Women living in rural areas had a higher level of completed fertility than women living in metropolitan areas or small towns.

(5) Completed fertility of women who married at younger ages was higher than those who married at older ages. In most groups, DRAT values, which control for marriage duration, however are marginally higher for women who married at older ages. Thus, if duration of marriage is controlled, age at marriage appears not to affect the completed fertility level. This suggests therefore the impact of age at marriage on fertility is primarily a duration effect.

(6) Women who ever used at least one method of contraception were those who had higher completed fertility. A separate analysis was carried out on currently married women who were not pregnant at the time of survey. The results (not shown) indicate that Malay women practising contraception were those with higher levels of completed fertility while the reverse is true for Chinese women, that is those practising contraception had a lower level of completed fertility.

The process of quantum fertility is next studied using parity progression ratios (PPR). The PPR can be used as such a measure because it is the proportion of women with a birth of any particular order who go on to have at least one higher order birth.

6.3. PARITY PROGRESSION RATIO

Parity progression ratios as such cannot be calculated directly from survey data because of both selectivity and censoring bias. Selectivity bias results because the transition from parity i to i+1 can only be studied for women who have at least reached parity i at the time of the survey. For example, women from younger age cohorts who have reached parity 2 tend to be those who have married early, have children in quick succession, are more fertile and less educated. The characteristics of these women therefore cannot be representative of the whole population. Censoring results when a woman who has reached parity i at the time of survey has not reached parity i+1 but will eventually do so. To avoid both selectivity and censoring biases and the problem of omission or displacement of births, a life table technique is used on a sample of women who initiated their birth or marriage 5 to 20 years before the survey and were aged below 45 years.* The parity progression ratio as such cannot be calculated but the proportion of women having a birth after a reasonably long duration, taken as 5 years, is a natural analog.

---

*Inclusion of all intervals will result in under-representation of older cohorts as a certain proportion would have died and an over-representation of younger ages at the beginning of intervals as younger cohorts would not have had the chance to initiate intervals at older ages. Also, intervals initiated in the recent periods would not have had the chance of closing. More details are presented in Sect. 7.1.

Table 6.9

Percentage of Women who had a Birth Within Five Years of Marriage or Since the Last Birth by Various Characteristics, 1974 MFFS**

	Race									
	Malay					Chinese				
	M-1	1-2	2-3	3-4	4-5	M-1	1-2	2-3	3-4	4-5
	94	90	86	85	84	98	95	90	83	82
Years of education										
None	91	88	83	84	83	98	96	84	86	86
1+	95	91	88	86	85	98	94	88	81	79
Age at First Marriage										
Less than 17	93	93	85	85	84	*	*	*	*	*
17,18	96	91	89	87	86	100	98	94	87	84
19,20	96	87	84	87	84	97	97	92	89	87
21+	95	83	82	80	*	97	93	86	77	76
Work Status										
Never-worked	93	89	84	84	82	98	95	90	83	83
Ever-worked (includes currently working)	96	92	89	88	88	99	95	92	84	78
Migration Status										
Migrant	96	90	85	85	84	98	97	92	84	83
Non-migrant										
Urban	92	88	81	*	*	97	91	80	71	71
Rural	94	90	86	86	84	98	96	96	92	90
Number of Times Married										
Once	96	91	88	88	87	98	95	91	83	82
2+	84	84	78	76	75	*	*	*	*	*
Age at First Birth										
20 years or less	99	94	87	87	85	100	98	96	86	83
21+	95	82	82	78	79	100	94	87	79	78
Period										
1970-74	*	85	82	79	83	*	*	*	*	*
1965-69	95	93	93	93	95	99	99	98	96	93
1960-64	98	96	96	95	98	100	100	98	98	99
1955-59	99	99	99	99	97	100	100	98	98	99
Birth Cohort										
1950-54	96	*	*	*	*	100	*	*	*	*
1945-49	95	94	89	88	*	99	97	*	*	*
1940-44	94	93	87	87	89	98	96	92	91	83
1935-39	94	89	89	89	85	97	95	91	83	84
1930-34	88	*	83	83	84	97	95	86	80	82
Marriage Cohort										
1965-69	96	93	*	*	*	98	95	94	*	*
1960-64	92	92	87	87	*	98	94	89	93	82
1955-59	93	92	87	89	85	100	97	92	84	78

** M-1 probability of having a first birth; 1-2 probability of a woman with one previous live birth having the second live birth, and so on.

* less than 100 cases. Smith (1980:22) showed that the rates obtained using the life table technique fluctuate substantially for number of cases near or below 100.

As observed earlier in this chapter, in 1964, a higher proportion of Chinese births were fifth or higher order compared with Malay births. By 1979, the situation had reversed. In both groups the proportion of births that were fifth or higher order has declined over time.

The 1974 MFFS data (rf. Table 6.9) indicate that a higher proportion of Chinese women than of Malay women had a first, second or third child within five years after marriage or after the first child or the second child, respectively. A slightly higher proportion of Malay women, however, had a fourth or fifth child after having the third or fourth child respectively, compared with the Chinese women. The parity progression ratios have therefore captured the effect of fertility decline for the Chinese women in relation to the Malay women.

6.3.1. EFFECT OF AGE AT FIRST MARRIAGE, AGE AT FIRST BIRTH AND MARITAL STABILITY

If the women who married before 17 years of age are excluded because a proportion of these women could not have a child because of adolescent sterility, it is generally true (rf. Table 6.9) that the younger the age at marriage, the higher the proportion of women who had a child within five years of the previous child or marriage. The only exceptions are the probabilities of a Chinese woman having a fourth or fifth child after the third or fourth child respectively. These probabilities are slightly lower for Chinese women who married at age 17-18 years compared with those married at 19-20 years. One

can therefore postulate that age at first marriage has some effect on the proportion of women who go on to have the next child. Within age at first marriage categories, the Chinese women compared with the Malay women again show a higher probability of having a first, second and third child. The probability of having a fourth or fifth child was however higher for the Malays. This pattern seems to be generally true by other characteristics.

The pattern as observed by age at first marriage, for example, is observed for age at first birth categories, that is the younger the age at first birth, the higher the probability that a woman will go on to have the next child. Therefore, even if age at first marriage is not a correct indicator of the start of exposure to childbearing particularly of women in older cohorts, many of whom did not live with their husbands immediately after marriage (refer Chap. 2), the age at first birth clearly indicates that the start of exposure to childbearing has some effect on the probability that a woman will have a next child.

Marital stability seems to affect the probability of a woman having the next child. For example, about 91 percent of Malay women married only once went on to have the second child 5 years after having the first child while only 84 percent of Malay women married more than once did so. The sample size of Chinese women who married more than once is too small for analysis. Chinese women, compared with Malay women married only once, still had a higher probability of having the first, second or third child after marriage or after the first or second child, respectively. On the other hand, Malay women married only once had a higher probability of having the fourth or

fifth child.

6.3.2. EFFECT OF EDUCATION, WORK STATUS AND MIGRATION STATUS

Educated Malay women have a higher probability of having the next child compared with uneducated women (rf. Table 6.9). Chinese women also have the same pattern for the first, second and third child but uneducated women had a higher probability of having a fourth or fifth child than educated women. As pointed out earlier, this classification of education leaves a very heterogeneous group of educated women, from 1 year of education to university level. But as the group of women, particularly Malays, who had more than 6 years of education was very small in number, no sub-classification was carried out. A possible explanation of why educated women may have a higher probability of having a child than uneducated women is that uneducated women married at very young ages and teenage subfecundity may account for the lower probability of the first or even the second birth. For subsequent births, as educated women have a higher possibility of being employed outside the home they may wish to space their children closer together in order to quicken the pace of completing their childbearing. The presence of relatives and servants to help in childcaring may also nullify some of the effects of education and workforce participation on childbearing.

Work status, that is whether a woman has ever-worked, including those currently working, or never-worked, also seems to affect the probability of having the next child. Women who never worked had a higher probability of having the next child compared with women who

worked, except for the probability of having a fifth child for the Chinese women, where the pattern is reversed. As stated earlier, this measure is a very rough one.

As expected, except for one or two categories, non-migrants in urban areas had the lowest probability of having the next child while non-migrants in rural areas had the highest probability and migrants had a probability in between these two extremes.

6.3.3. PERIOD AND COHORT EFFECTS

Except for some minor fluctuations, women who had a birth in 1955-59 had a higher probability of having the next child than women who had a birth in the recent periods before the survey. One can postulate that in the recent periods, with increasing urbanisation, education and greater participation of women in the labour force, and the introduction of family planning in 1967, more women tend not to want to have the next child. This evidence corroborates the earlier observation of fertility decline. The pattern by birth cohorts is not so clear. Generally women in the younger birth cohorts had a higher probability of having the next child than women in the older cohorts. For the first birth, the lower probability of older cohorts may be due to teenage subfecundity because of young age at marriage. For other births, this may reflect a tendency for women in the younger cohorts, being more highly educated and therefore more likely to be in the work force, to want to space their children closer together. It is relevant to point out that this tendency pretty much disappears among the Malays after two children and among the Chinese after four

children.

The pattern by marriage cohorts seems to be the reverse of that by birth cohort for the Chinese women, up to the third birth, that is older marriage cohorts generally had a higher probability of having the next child than younger cohorts. The Malay pattern remains essentially the same. As mentioned earlier in Chapter 5, the results by marriage cohorts and birth cohorts are not directly comparable because of an age at marriage bias and an age distribution bias inherent in the marriage cohorts obtained from survey data. The women who married in 1955-59 could have been born in 1930-45 while those married in 1960-64 could have been born in 1935-49. Thus, if the population is growing, which means increasing birth cohort size, a more recent marriage cohort will be weighted more heavily by the behaviour of younger birth cohorts. As younger birth cohorts are postponing marriage and women married at older ages have a lower probability of having a birth, as observed earlier, this will tend to result in a lower probability of having a birth for a more recent marriage cohort than an older one. The indefinite patterns by cohorts, both marriage and birth, is probably affected on the one hand by the availability of family planning in the case of younger birth cohorts and on the other by the desire of women to space their children closer together as a result of work force participation and education.

The next section attempts to see how much of these changes in fertility can be explained by nuptiality behaviour, controlling for other important variables.

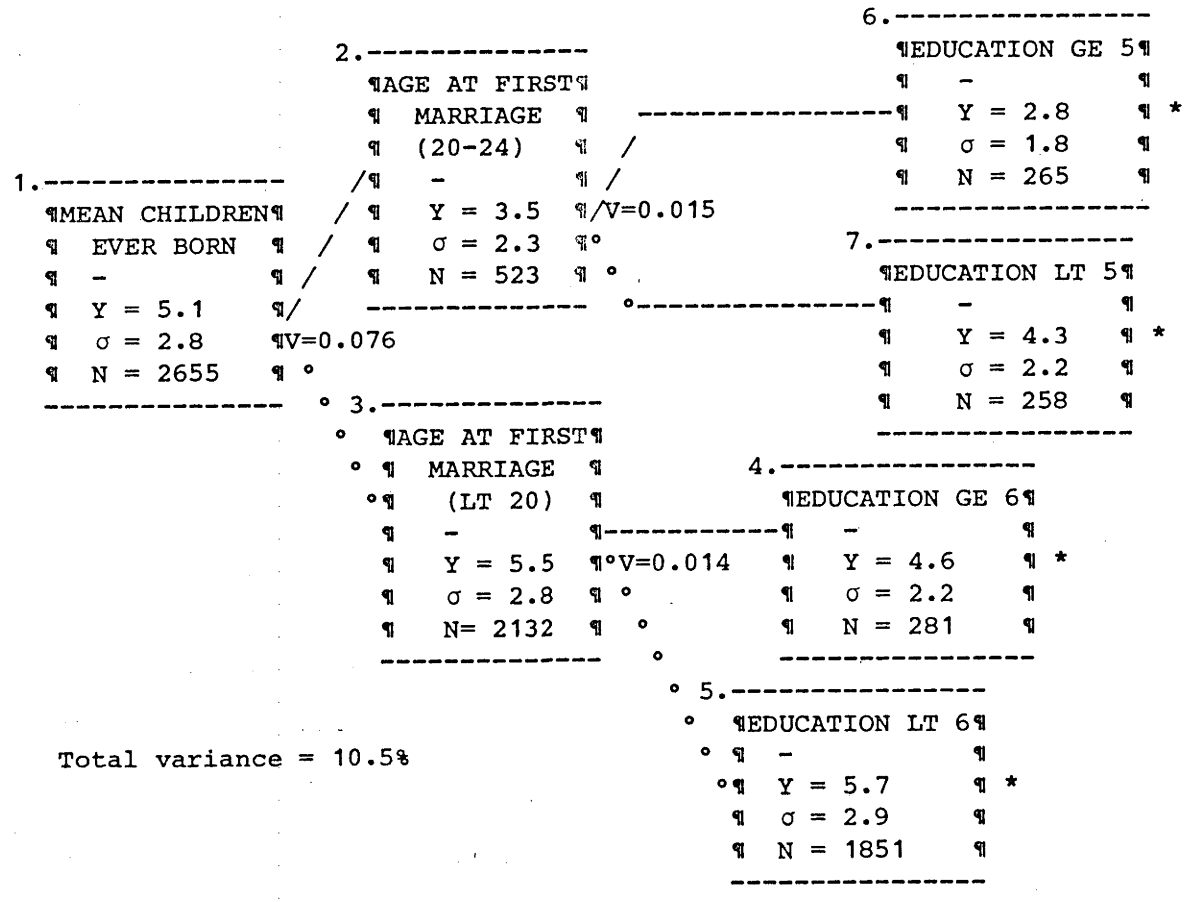


FIGURE 6.1A: AID TREE OF BEST SPLITS ON MEAN CHILDREN EVER BORN OF MALAY WOMEN AGED 25 YEARS AND OVER WHO MARRIED BEFORE 25 YEARS OF AGE

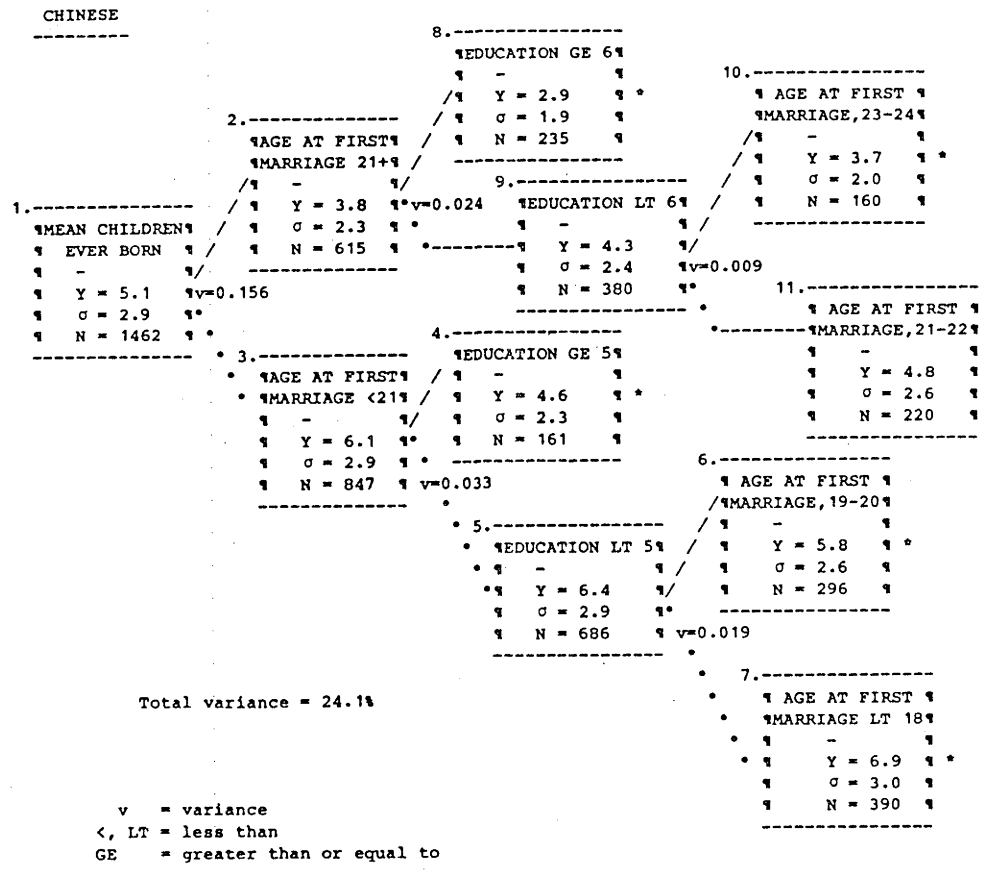


FIGURE 6.1B: AID TREE OF BEST SPLITS ON MEAN CHILDREN EVER BORN OF CHINESE WOMEN AGED 25 YEARS AND OVER WHO MARRIED BEFORE 25 YEARS OF AGE

6.4. MULTIVARIATE ANALYSES: MARRIAGE AND FERTILITY

6.4.1. MULTIPLE CLASSIFICATION ANALYSIS

Both the AID analysis and analysis of variance, using mean CEB as the dependent variable and race, education level, migration status, age at first marriage and work experience as independent variables, reveal that interaction effects in the total sample of Malay and Chinese women are of some importance (results not presented). AID analysis is therefore repeated for the Malay and Chinese samples separately. Figure 6.1 presents the tree diagram for these analyses. For both Malay and Chinese women, only the age at first marriage and education level are found to be important in explaining the variation in the number of children ever born.* Both trees look symmetrical, suggesting additivity of predictor effects. The profile of means and the proportion of variation that is explained by a partition using the variable under consideration (results not shown) seem to indicate unimportant interaction effects. Also, the adjusted R^2 from MCA for both the Malay and Chinese samples are greater or equal to the R^2 obtained from the respective AID-search, suggesting that interaction effects are not important in both samples. The analysis of variance results indicate that two-factor and higher-order interactions are not important in both samples. Therefore, MCA is next used to determine

---

*The inclusion of the variable, ever-use of contraception in addition to the other variables reveals that this variable is important in affecting the fertility of women who married before 20 or 21 years of age, particularly those with less than 5 or 6 years of education. Repetition of the AID analysis using the same independent variables for subsamples containing only women married once and women married for 5 years or more reveal the same results. DRAT is not used as a dependent variable in MCA analysis because of significant interaction effects between most of the independent variables.

the importance of the five variables, age at first marriage, ever-use of contraception, educational level, migration status and work experience, on mean number of children ever born.

As the main interest here is on the relationship between the age at first marriage and fertility, the MCA results are shown for each category of age at first marriage (rf. Table 6.10). The analysis of variance results (not shown) indicate that at 0.01 level, age at first marriage, educational level and ever use of contraception are significant in all samples while migration status is significant in the Chinese sample and work experience is not significant in all samples. The difference in the mean number of children ever born between Malay women married before the age of 17 years and those married after the age of 21 years is about two children while for the Chinese women, the difference is about three children.* Control of other factors reduces the difference between the above two groups by about 0.4 of a child for Malay women and about 0.5 of a child for Chinese women. The substantial difference between women married at young ages and those married at older ages however is largely explained by differences in marriage duration. Neither age nor marriage duration can be introduced into the model for MCA because of significant interaction between this variable and most of the other variables. Thus, instead of fertility for all women, only completed fertility is used. Subsequently, MCA are carried out separately for each birth and marriage cohort.

---

*The fertility level calculated for women married only once and married for five years or more is higher than the level calculated for all women regardless of marital status. As the observed pattern remains subsequent figures are not calculated for the smaller samples of women married only once who have been married for 5 years or more.

Table 6.10

Mean Number of Children Ever Born With or Without Adjustment for Work Experience, Educational Level, Migration Status and Status of Contraceptive Usage by Age at First Marriage Categories, Ever-married Women Aged 25 Years and Over who married Before Age 25 Years, 1974 MFFS*

	Race/ Age at First marriage									
	Malays					Chinese				
	lt 17	17,18	19,20	21-24	diff.	lt 17	17,18	19,20	21-24	diff.
None	5.6	5.4	4.7	3.3	2.3	7.0	6.5	5.4	3.8	3.2
	(6.0)	(5.5)	(4.7)	(3.9)	(2.1)	(7.0)	(6.6)	(5.4)	(4.3)	(2.7)
N	1378	568	343	371		146	316	385	616	
	(914)	(455)	(284)	(252)		(131)	(304)	(376)	(499)	
Controlled by										
Work Experience	5.6	5.4	4.7	3.3	2.3	7.0	6.5	5.4	3.8	3.2
	(6.0)	(5.5)	(4.7)	(3.9)	(2.1)	(7.0)	(6.6)	(5.4)	(4.3)	(2.7)
+ Education	5.5	5.4	4.7	3.6	1.9	6.7	6.3	5.3	4.0	2.7
	(5.9)	(5.5)	(4.8)	(4.1)	(1.8)	(6.8)	(6.4)	(5.4)	(4.5)	(2.3)
+ Migration Status	5.5	5.4	4.7	3.6	1.9	6.7	6.2	5.3	4.0	2.7
	(5.9)	(5.5)	(4.7)	(4.1)	(1.8)	(6.8)	(6.3)	(5.4)	(4.5)	(2.3)
+ Contraceptive Use	5.5	5.4	4.7	3.6	1.9	6.7	6.2	5.3	4.0	2.7
	(5.9)	(5.5)	(4.7)	(4.1)	(1.8)	(6.8)	(6.3)	(5.4)	(4.5)	(2.3)

lt less than
diff. difference between the first and last age at marriage categories
N number of cases
* Figures in brackets refer to women married only once and who have been married for five years or more

Table 6.11

Estimates of Completed Fertility of Malay and Chinese Women who Married before Age 25 Years With or Without Control for Work Experience, Educational Level, Migration Status and Contraceptive Use Status by Age at First Marriage Categories, 1974 MFFS

Age at First Marriage	Women Aged GE 40		Women Aged GE 45		Women Who Want No More Children	
	Malays	Chinese	Malays	Chinese	Malays	Chinese
Less than 17	6.0 (6.1)	7.3 (7.3)	5.7 (5.7)	7.7 (7.5)	6.2 (6.2)	7.1 (7.0)
17,18	6.5 (6.5)	7.6 (7.4)	6.6 (6.6)	8.0 (7.7)	6.2 (6.1)	6.8 (6.6)
19,20	6.4 (6.2)	6.7 (6.8)	6.2 (6.1)	7.0 (7.1)	5.7 (5.7)	5.9 (5.9)
21-24	5.3 (5.4)	5.7 (5.9)	5.7 (5.7)	6.1 (6.3)	4.6 (4.7)	4.7 (4.9)
Difference(a)	1.2 (1.1)	1.9 (1.5)	0.9 (0.9)	1.9 (1.4)	1.6 (1.4)	2.1 (1.7)

GE greater than or equal to

(a) indicates difference between the second and fourth categories

Note: Figures in brackets indicate control for other variables. Age at first marriage is not significant at 0.05 level for Malay women greater than 44 years of age. For all other categories age at first marriage is significant at 0.05 level

Table 6.12

Mean Number of Children Ever Born of Malay and Chinese Women Aged 25 Years and Over who Married before Age 25 Years With or Without Control for Work Experience, Contraceptive Use Status, Migration Status, Educational Level by Age at First Marriage Categories by Birth and Marriage Cohorts, 1974 MFFS

	Race / Age at First Marriage									
	Malays					Chinese				
	lt 17	17,18	19,20	21-24	Diff.(a)	lt 17	17,18	19,20	21-24	diff.(a)
Birth Cohorts										
1945-49	4.0	3.6	2.8	1.9	1.7	*	4.3	3.3	2.1	2.2
	(4.0)	(3.6)	(2.8)	(1.9)	(1.7)	(*)	(4.1)	(3.3)	(2.2)	(1.9)
1940-44	5.2	4.9	4.2	3.3	1.6	*	5.7	4.6	3.6	2.1
	(5.2)	(4.9)	(4.2)	(3.3)	(1.6)	(*)	(5.6)	(4.4)	(3.8)	(1.8)
1935-39	6.3	5.9	5.3	4.2	1.7	*	6.3	5.9	4.8	1.5
	(6.3)	(5.8)	(5.2)	(4.3)	(1.5)	(*)	(6.3)	(5.9)	(4.8)	(1.5)
1930-34	6.6	6.4	6.7	*	-	*	7.3	6.4	5.4	1.9
	(6.6)	(6.4)	(6.4)	(*)	(-)	(*)	(7.2)	(6.4)	(5.6)	(1.6)
1925-29	5.8	6.5	6.4	5.7	0.8	7.3	7.8	7.3	6.1	1.7
	(5.8)	(6.5)	(6.4)	(5.7)	(0.8)	(7.2)	(7.5)	(7.3)	(6.3)	(1.2)
Marriage Cohorts										
1965-69	*	3.1	2.7	2.6	0.5	*	*	3.2	2.9	-
	(*)	(3.1)	(2.7)	(2.6)	(0.5)	(*)	(*)	(3.2)	(3.0)	(-)
1960-64	4.0	4.2	4.1	3.7	0.5	*	4.9	4.4	4.1	0.8
	(4.1)	(4.1)	(4.1)	(3.7)	(0.4)	(*)	(4.8)	(4.3)	(4.3)	(0.5)
1955-59	5.2	5.9	5.2	4.7	1.2	*	6.1	6.0	5.3	0.8
	(5.1)	(5.9)	(5.2)	(4.9)	(1.0)	(*)	(6.0)	(5.9)	(5.5)	(0.5)
1950-54	6.3	6.0	6.5	5.2	0.8	*	6.6	6.3	5.6	1.0
	(6.3)	(6.0)	(6.4)	(5.4)	(0.6)	(*)	(6.6)	(6.3)	(5.7)	(0.9)
1945-49	6.5	6.5	6.5	*	-	*	7.7	7.2	6.5	1.2
	(6.5)	(6.6)	(6.6)	(*)	(-)	(*)	(7.3)	(7.3)	(6.9)	(0.4)

lt less than
diff.(a) difference between the second and the fourth categories
* less than 30 cases
- not calculated
Note: Age at First Marriage is significant at 0.05 level in all groups except 1925-29 Malay birth cohort, 1945-49 Chinese marriage cohort, 1960-64, 1950-54 and 1945-49 Malay marriage cohorts.
Figures in brackets indicate control for other variables.

The relationship between the age at first marriage (above 16 years of age) and completed fertility (rf. Table 6.11) is also negative. Three measures of completed fertility are used: the mean number of children ever born of women aged 40 years and over, women aged 45 years and over and women aged 25 years and over who said they want no more children. The negative relationship between age at first marriage (above 16 years of age) and completed fertility remains even with control for education, work experience, contraceptive use status and migration status (rf. figures in brackets in Table 6.11). For the Malay women, the difference in the mean number of children ever born of women who married at ages 17-18 years and those who married after 20 years is about one child while for the Chinese, the difference is about 2 children, with or without control for other variables.[5]

BIRTH COHORT

The negative relationship between the age at first marriage and the mean number of children ever born remains with control for birth cohorts (rf. Table 6.12). If the group of women who married before 17 years of age is excluded, it is clearly seen that women who married at older ages have fewer children than women who married at younger ages. The difference in the mean number of children of women who married at ages 21-24 years is about two children fewer than those who married at 17-18 years of age, except for the 1925-29 (about one child) and the 1930-34 (no information) Malay birth cohorts. Generally, there seems to be a greater difference in fertility between women who married early and those who married late, that is 21-24 years of age, among the younger cohorts than the older cohorts. This is a result of

selectivity bias because women in younger cohorts who married late had not had the chance of having children.

MARRIAGE COHORT

By marriage cohorts also the relationship between the age at first marriage and fertility, as measured by mean number of children ever born, remains negative, that is women who married late generally had fewer children than women who married early (rf. Table 6.12). The difference in fertility between the women who married early and those who married late is about one child and this difference applies across all cohorts. The one child may still reflect some selectivity bias within the marriage cohorts.

In an attempt to include, in a single model, independent variables which have significant interactions with one another, such as age at marriage and marriage duration, log-linear models are used.

6.4.2. LOG-LINEAR MODELS

The log-linear models are fitted using a computer package called GLIM (Generalised Linear Interactive Model).* Linear models are not used because the fitted values can be negative and this is undesirable when the response is non-negative. Little (1978) using the Fiji Fertility Survey also showed that multiplicative models performed better than linear models, using parity as the dependent variable. The analysis was first carried out using three independent variables,

---

*GLIM is a Fortran program using interactive weighted least squares, distributed by Numerical Algorithms Group, 13 Banbury Road, Oxford OX2 6NN, U.K.

age at first marriage, education level and birth cohorts. Age at first marriage and education level are used because they were found to be the two most important determinants of mean CEB in the AID results. Birth cohorts are used in order to estimate cohort effects. In subsequent analyses, other independent variables, such as contraceptive use status, work status and migration status, will be introduced. The reason for not including all explanatory variables in one analysis is that it becomes impracticable to fit all models. Also, apparently, as shown by Goodman (1972), the relationship between a dependent and any independent variable can be summarised adequately using information contained in small-dimension tables, such as two-way or three-way tables.

The sample used in the first analysis consists of women aged 25 to 49 years who married before the age of 25 years and married only once. Following Little (1978), a cross-tabulation with mean CEB as cell entries is carried out (rf. Appendix 6.1 for table). Three levels of education are used, no education, 1-6 years, 7+ years. Age at first marriage comprises four categories, less than 17, 17-18, 19-20 and 21-24 years. Three categories of birth cohorts are used, 1945-49, 1935-44, 1925-34. The main reason for using these classifications is because contraceptives became widely available, particularly in the rural areas, after the National Family Planning Programme was introduced in 1967. As explained earlier, the birth cohort of 1945-49 would have been exposed to the availability of contraceptives almost at the start of childbearing. Women in the 1935-44 birth cohort would have been at various stages of childbearing when modern contraceptives were introduced while women in the last birth cohort of 1925-34 would have been nearing the end of their

childbearing.

A stepwise model-fitting procedure is used to identify the variables which have a statistically significant direct effect on mean number of children ever born. A Poisson error distribution is assumed in all models and all models considered are hierarchical.* A model is considered 'best' and selected if it has low mean deviance and contains as few terms as possible. A model is not selected based on the scaled deviance alone as the addition of more parameters into the model always improves the fit. Also, a model that has no interaction term but has slightly higher mean deviance is selected in favour of a model that has an interaction term and lower deviance. This is because the results for interaction terms are very difficult, if not impossible to interpret, particularly if it involves many variables.

EFFECT OF EDUCATION, AGE AT FIRST MARRIAGE AND BIRTH COHORTS

Selecting the Model

Table 6.13 presents the results obtained by fitting all hierarchical log-linear models to the three-way cross classification of mean CEB in Appendix 6.1. It can be seen from Table 6.13 that models which take into account both cohort and age at first marriage

---

*A hierarchical model is one which includes not only a parameter involving a set of variables X but also all the parameters involving any subset of X. For example, if a three factor interaction, λ^{ABC}_{ijk}, is included in the model then all the main effects, λ^{A}_{i}, λ^{B}_{j}, λ^{C}_{k}, must be included with all the two-factor interactions, λ^{AB}_{ij}, λ^{AC}_{ik}, λ^{BC}_{jk}.

Table 6.13

Hierarchical Log-linear Models Applied to Mean Number of Children Ever Born by Birth Cohorts (C), Age at First Marriage (A) and Education (E), Malay and Chinese Women Over 25 Years of Age, Married before the Age of 25 Years and Married Only Once, 1974 MFFS

	Malays			Chinese		
Model (a)	df	deviance	mean deviance	df	deviance	mean deviance
Ø	34	983.6	28.9	33	1033	31.3
E	32	759.2	23.7	31	702.1	22.6
A	31	607.9	19.6	30	701.7	23.4
C	32	292.4	9.1	31	342.1	11.0
A,C	29	81.5	2.8	28	124.8	4.5
A,C,E	27	69.0	2.6	26	39.6	1.5
C,E	30	239.3	8.0	29	186.0	6.4
E,A	29	519.2	17.9	28	514.8	18.4
CA,E	21	25.4	1.2	20	15.0	0.8
CA	23	32.0	1.4	22	93.5	4.2
CE,AC	17	24.4	1.4	16	13.4	0.8
CE,AC,AE	11	19.9	1.8	10	9.5	1.0
CE	26	232.7	9.0	25	181.1	7.2
AE	23	497.6	21.6	22	487.3	22.2
ACE	0	0.0	-	0	0.0	-

(a) This notation is similar to that used by Goodman (1970) to describe models for contingency tables.

Ø is the null model, that is the effects of A, E and C are not included. The model labelled AE includes the two-factor effect of A and E and the main effects, A and E.

df degrees of freedom

effects have lower mean deviance than other models.** The largest model with a mean deviance is the (CE,AC,AE) model which assumes that the three factor effect is zero. Model (CA,E) has the lowest mean deviance for both the Malays and Chinese but a simpler model, that is a model containing fewer parameters, with slight increases in mean deviance is preferred for reasons specified earlier. To compare the performance of nested log-linear models, the chi-square test is used.* If model 1 is obtained from model 2 by setting parameters in model 2 to zero, the difference in the deviance between the two models is approximately chi-squared with the degrees of freedom equalled to the difference in the degrees of freedom between the two models. For example, the chi-square test for model (A,C) and (A) indicates that the effect of C is significant at 0.05 level. Similarly, the chi-square tests for models (E), (A) and (C) with the (Ø) model indicate that the effects of E, A and C are significant at 5 percent level. The only significant two factor interaction at 0.05 level is CA, for both the Malays and the Chinese. In view of the fact that the criteria of selection of a model are not only in terms of low mean deviance but also in terms of simplicity, that is, as few parameters as possible, for both the Chinese and the Malays, the model (A,C,E) is taken to be the 'best'. The fitted values from this model are presented as the first values in Appendix 6.1. Inspection of the fitted values and the observed values suggests that the model provides

---

** The saturated model (ACE) (that is the model that includes all possible main and interaction effects) has no mean deviance (defined as the deviance divided by the degrees of freedom) since the deviance and the degrees of freedom are both zero.

* Two hierarchical models are considered nested if one model is obtained from the other by setting some non-zero effects equal to zero. For example models (E,A) and (A) are nested, that is the coefficient of E is set to zero in the latter model.

Table 6.14

Estimated Effects of Birth Cohorts (C), Education (E) and Age at First Marriage (A) on Mean CEB in Various Log-linear Models With or Without Control for Other Factors for Malay and Chinese Women, Aged 25 Years and Over who Married before the Age of 25 Years and Married Only Once, 1974 MFFS

Parameter	Raw Estimates	Calculated Ratios*	(A,C,E)	Calculated Ratios*	(CA,E)	Calculated Ratios*
Malays						
Education (in Years)						
1-6	-0.1748 (0.0204)	1.19	-0.0016 (0.0216)	1.00	-0.0024 (0.0216)	1.00
7+	-0.6912 (0.0542)	2.00	-0.1932 (0.0577)	1.21	-0.1436 (0.0585)	1.15
Age at First Marriage						
17-18	-0.0832 (0.0245)	1.09	-0.0494 (0.0247)	1.05	-0.1566 (0.0621)	1.17
19-20	-0.2516 (0.0311)	1.29	-0.1762 (0.0313)	1.19	-0.3806 (0.0725)	1.46
21-24	-0.5927 (0.0337)	1.81	-0.4256 (0.0354)	1.53	-0.7447 (0.0744)	2.11
Birth Cohorts						
1935-44	0.5327 (0.0285)	0.59	0.4719 (0.0292)	0.62	0.3704 (0.0423)	0.69
1925-34	0.7434 (0.0297)	0.48	0.6453 (0.0318)	0.52	0.4869 (0.0442)	0.61
Chinese						
Education (in Years)						
1-6	-0.2696 (0.0243)	1.31	-0.0429 (0.0259)	1.04	-0.0505 (0.0261)	1.05
7+	-0.8441 (0.0541)	2.33	-0.4856 (0.0562)	1.63	-0.4708 (0.0563)	1.60
Age at First Marriage						
17-18	0.1799 (0.0366)	0.84	-0.0093 (0.0378)	1.01	0.0964 (0.0865)	0.91
19-20	0.0139 (0.0362)	0.99	-0.1284 (0.0370)	1.14	-0.1275 (0.0749)	1.14
21-24	-0.3597 (0.0353)	1.43	-0.3495 (0.0365)	1.42	-0.5410 (0.0668)	1.72
Birth Cohorts						
1935-44	0.5122 (0.0328)	0.60	0.5074 (0.0344)	0.60	0.5106 (0.0789)	0.60
1925-34	0.8122 (0.0322)	0.44	0.7308 (0.0346)	0.48	0.6085 (0.0649)	0.54

CEB = children ever born

* The ratios are relative to the value for the first category of each variable, that is the omitted category. For example, 1.19 indicates that uneducated women had 19 percent more children than women educated for 1-6 years. Similarly women in the 1945-49 birth cohort had 41 percent less children than the 1935-44 birth cohort (that is 1-0.59 = 0.41).

Note:(1) Restrictions are imposed on the parameters (that is the first level of each parameter is set to zero) so that each set of fitted values corresponds to a unique set of parameters. The first levels of all parameters are therefore not presented. The omitted categories are (a) women with no education, (b) women married before age 17 years, (c) 1945-49 birth cohort.

(2) Figures in parentheses are standard errors.

quite a good fit to the data. The fit is generally good for those cells with a large sample size, where the sample means have a small variance.

Estimates of the Effects

Table 6.14 presents the estimated effects of education, age at first marriage and birth cohorts on mean children ever born from three log-linear models. The estimates of the coefficients of the independent variables as presented in columns 2, 4 and 6 can be interpreted in relation to the omitted category. For example, for the Malay women (in col. 2), the ratio of the mean parity of women with no education to that of women with 1-6 years of education is $e^{0.1748} = 1.19$ (as shown in col. 3). In other words, uneducated women had 19 percent more children than women with 1-6 years of education. Similarly, uneducated Malay women had almost 100 percent more children than women with more than 6 years of education. Comparison of the mean parities of Malay women with 1-6 years of education and those with more than 6 years of education indicates that women with 1-6 years of education had about 68 percent more children. The values in column 4 for education (Malays) indicate that women with no education had 0.2 percent and 21 percent more children than women with 1-6 years of education or more than 6 years of education, respectively, controlling for birth cohort and age at first marriage. The additional control of the two-factor interaction term (CA) reduces the difference in the mean parities of women with no education and those with 7 years or more of education to 15 percent more children. In the same way, the differences in the mean parities by age at first

marriage and birth cohort can be interpreted.

EFFECT OF CONTRACEPTION

The addition of the variable, ever-use of contraception to the above model reveals that at the 0.05 level, all three-factor interactions are not significant for both the Malay and Chinese groups while CA is the only significant two-factor interaction for the Chinese and PC (P=ever-use of contraception) and CA and AE are significant for the Malays. In the previous model AE was only marginally insignificant. For simplicity and the fact that the mean deviance only increases slightly for a model without the interaction terms, the model (A,C,E,P) seems to be the 'best'. From this model, the estimates of the various effects for both the Malays and Chinese on mean CEB again are negative for education and age at first marriage, except Chinese women married at ages 17-18 years, which is slightly positive, while the interpretation of the effects of contraception is that women who used contraception were those with a higher number of children. This result agrees with earlier results obtained using MCA. The use of DRAT as the dependent variable in models involving contraceptive use, age at first marriage and education as independent variables also results in the same pattern. An analysis is next carried out using young (25 to 35 years) currently married women who married before the age of 25 years to study the effect of contraception on mean children ever born for these women.

Table 6.15

Estimated Effects of Age at First Marriage (A), Education (E), Current Use of Contraception (P), Uncontrolled for Other Variables and in Model (A,E,P), Currently Married Women Aged 25-35 Years who Married before the Age of 25 Years, 1974 MFFS

Parameter	Raw Estimates	Calculated Ratios	Estimates in (A,E,P)	Calculated Ratios
Malays				
Education (in Years)				
1-6	-0.1001 (0.0343)	1.11	-0.0697 (0.0343)	1.07
7+	-0.5646 (0.0696)	1.76	-0.2925 (0.0751)	1.34
Age at First Marriage				
17-18	-0.0744 (0.0388)	1.08	-0.0653 (0.0392)	1.07
19-20	-0.3047 (0.0478)	1.36	-0.2902 (0.0480)	1.34
21-24	-0.6442 (0.0494)	1.90	-0.5830 (0.0530)	1.79
Contraceptive Practice				
Inefficient	0.0626 (0.0640)	0.94	0.0841 (0.0641)	0.92
Efficient	0.0521 (0.0363)	0.95	0.1268 (0.0369)	0.88
Chinese				
Education (in Years)				
1-6	-0.1493 (0.0491)	1.16	-0.1002 (0.0487)	1.11
7+	-0.7032 (0.0808)	2.02	-0.5167 (0.0840)	1.68
Age at First Marriage				
17-18	-0.0272 (0.1002)	1.03	-0.0079 (0.1003)	1.01
19-20	-0.2937 (0.0992)	1.34	-0.2601 (0.0994)	1.30
21-24	-0.6542 (0.0958)	1.92	-0.5492 (0.0970)	1.73
Contraceptive Practice				
Inefficient	0.0245 (0.0665)	0.98	0.0561 (0.0667)	0.95
Efficient	0.0893 (0.0448)	0.91	0.0865 (0.0453)	0.92

Note same as Table 6.14
The omitted categories are (a) women with no education, (b) women who married before age 17 years, (c) women who did not use any method

The results obtained by fitting all hierarchical log-linear models to the three-way cross-classification of mean CEB by age at first marriage, education and contraceptive use of currently married women aged 25-35 years are presented in Appendix 6.2. In terms of the mean deviance and simplicity, model (A,E,P) seems to be the 'best'. Note however that the effect of P is marginally not significant at 0.05 level for the Chinese sample. The estimates of the effects of the various variables are presented in Table 6.15. Contraceptive use status has three levels, (1) not using any method, (2) using inefficient method, and (3) using efficient method: this includes methods such as the pill, condom, sterilisation, IUD, etc., as defined earlier. The effects of age at first marriage and education on mean CEB are both negative. As the estimates of the effects of these variables have been discussed earlier in another model, discussion here will concentrate only on the effects of the practice of contraception. It is clear that the practice of contraception does not cause a high number of children. Therefore the higher mean number of children is not an effect of the practice of contraception, but the number of children that a woman has appears to determine whether she practises contraception, and whether the method of contraception is efficient or not.

For the Malay women, for all levels of age at first marriage and education, those practising efficient methods of contraception had about 13.5 percent while those using inefficient methods had about 8.8 percent more children than those not using any method. Chinese women practising inefficient methods, in contrast, had 2.5 percent more children than those not practising any method while those practising efficient methods had 9.3 percent more children.

The use of CEB as the dependent variable in models containing birth cohorts, age at first marriage, education and contraceptive use as independent variables indicate that the independent variables are all significantly important at 0.05 level for both the Malay and Chinese currently married samples, above the age of 25 years. The model that is selected in both samples, based on the mean deviance and the number of parameters, is (A,E,P,C). The estimates of P using this model (results not presented) indicate that Malay women not using any method of contraception had about 17 percent fewer children than those using inefficient methods and about 20 percent fewer children than those using efficient methods. It is also clear that Chinese women of all levels of age at first marriage, education and birth cohorts who practised efficient methods of contraception had about 11 percent more children than those who did not use any method and about two percent more children than those who practised inefficient methods. Women who had more, or enough children generally tended to use more effective methods of contraception.[6]

An exercise is next carried out to see whether the use of contraception has different effects on fertility across birth cohorts, with control for the age at first marriage and education level, that is the model selected above. The estimated effects are presented in Table 6.16. Among Malay women of the 1945-49 to the 1935-39 birth cohorts, that is women aged 25-29 to 35-39 years at the time of the survey, those who did not use any method had on average fewer children than women who used an efficient method but more children than women using inefficient methods. For the 1930-34 birth cohort, that is women aged 40-44 years at the time of survey, those

Table 6.16

Estimated Effects of Contraceptive Use With Control for Education and Age at First Marriage in Various Birth Cohorts for Malay and Chinese Currently Married Women who Married before the Age of 25 Years, 1974 MFFS

Parameter	Birth Cohorts 1945-49	C.R.	1940-44	C.R.	1935-39	C.R.	1930-34	C.R.	1925-29	C.R.
Malays										
Inefficent Methods	-0.2116 (0.2546)	1.24	-0.2637 (0.2218)	1.30	-0.2631 (0.1915)	1.30	0.3775 (0.1870)	0.69	0.0053 (0.1907)	0.995
Efficient Methods	0.1685 (0.2313)	0.85	0.1149 (0.2011)	0.89	0.0218 (0.1776)	0.98	0.2731 (0.1911)	0.76	-0.7468 (0.2381)	2.11
Chinese										
Inefficient Methods	-0.2931 (0.2683)	1.34	-0.3314 (0.2204)	1.39	0.1499 (0.1893)	0.86	-0.0147 (0.1924)	1.01	-0.0069 (0.1684)	1.01
Efficient Methods	0.0729 (0.2436)	0.93	0.0331 (0.1998)	0.97	0.2838 (0.1837)	0.75	0.2581 (0.1805)	0.77	-0.0195 (0.1690)	1.02

Note same as Table 6.14
C.R. calculated ratios

who used a method of contraception had more children than those who did not use any method. Malay women aged 45-49, the 1925-29 birth cohort, who used efficient methods of contraception had relatively fewer children than women who did not use any method or who used inefficient methods. Thus, Malay women in younger age cohorts, below 40 years, seem only to practise efficient methods of contraception after they have had a certain number of children, otherwise, if they wish to space their children they rely on inefficient methods. On the other hand, Malay women in the older age cohorts, 40+ years, who practised more efficient methods of contraception had relatively fewer children than those who practised inefficient methods. The Chinese patterns are similar to those of the Malays.

EFFECT OF WORK STATUS, MIGRATION STATUS

The addition of the variable, work status, that is ever worked or never worked, together with age at first marriage and education, indicates that work status is not significant for the Malay sample but is marginally significant for the Chinese sample. This result corroborates earlier results from MCA, which indicate that work status is not as important as education or age at first marriage in affecting average fertility. The use of DRAT as the dependent variable, using the same independent variables, also produces similar results.

Migration status (migrant, non-migrant urban, non-migrant rural) is also not significant when added to age at first marriage and education in a model. Like the results obtained in the earlier analysis of variance, the results obtained by using DRAT as the

dependent variable also indicate migration status to be significantly important, at 5 pecent, for the Chinese but not significant for the Malays.

6.5. CONCLUSION

From the evidence presented in this chapter, the period fertility levels of both the Malay and Chinese women are declining over time, with the decline being faster for the Chinese than for the Malays. Period fertility decline is also indicated by the lower proportion of women having higher order births and the lower parity progression ratios over time. Cohort fertility is also declining but the rate of decline is less than that of period fertility. Up to the end of the 1970s, the cohort fertility level was above the period fertility level. The use of multivariate analyses, that is MCA and log-linear models, enable us to demonstrate that education and age at first marriage are important determinants of the differentials in the fertility level. These two variables are also likely to have stronger effects for the younger than the older cohorts. The effect of contraceptive use is not so clear-cut although for older cohorts those who used efficient means of contraception had smaller family sizes. Work status and migration status did not emerge as important determinants.[7]

Appendix 6.1

Mean Number of Children by Malay and Chinese Women Aged 25 Years and Over, Married only Once and Married before the Age of 25 Years by Age at First Marriage (A), Education (E) and Birth Cohorts (C), 1974 MFFS

Race/ Age at First Marriage	Education/ Birth Cohorts								
	No education			1-6			7+		
	1945-49	1935-44	1925-34	1945-49	1935-44	1925-34	1945-49	1935-44	1925-34
Malays									
less than 17 years	3.8	6.1	7.2	3.8	6.1	7.2	3.1	5.0	5.9
	4.3	6.1	6.7	4.2	6.1	7.3	4.0	7.0	1.5
	(42)	(196)	(195)	(128)	(209)	(92)	(5)	(2)	(2)
17,18	3.6	5.8	6.9	3.6	5.8	6.9	3.0	4.8	5.7
	3.6	5.8	6.8	3.7	5.7	6.9	2.3	4.9	10.0
	(16)	(62)	(78)	(88)	(130)	(51)	(9)	(10)	(1)
19,20	3.2	5.1	6.0	3.2	5.1	6.0	2.6	4.2	5.0
	3.1	4.7	7.3	2.8	4.9	6.2	2.6	3.3	6.7
	(15)	(47)	(37)	(65)	(69)	(28)	(11)	(4)	(3)
21+	2.5	4.0	4.7	2.5	4.0	4.7	2.0	3.3	3.9
	2.3	4.3	5.8	1.9	3.8	5.3	1.8	3.7	-
	(11)	(34)	(29)	(75)	(81)	(14)	(50)	(27)	(0)
Chinese									
less than 17 years	3.8	6.4	8.0	3.7	6.1	7.7	2.4	3.9	4.9
	5.7	6.4	7.6	3.8	6.5	7.1	-	9.0	3.5
	(3)	(18)	(42)	(122)	(19)	(28)	(0)	(1)	(2)
17,18	3.8	6.3	7.9	3.7	6.1	7.6	2.3	3.9	4.9
	4.3	5.9	7.8	4.3	6.4	7.3	-	4.3	4.0
	(12)	(57)	(71)	(31)	(60)	(46)	(0)	(7)	(3)
19,20	3.4	5.6	7.0	3.2	5.4	6.7	2.1	3.5	4.3
	3.8	5.5	7.1	3.4	5.3	6.6	2.0	2.3	4.0
	(14)	(50)	(80)	(64)	(82)	(52)	(7)	(3)	(6)
21+	2.7	4.5	5.6	2.6	4.3	5.4	1.7	2.8	3.5
	2.3	4.8	6.3	2.3	4.2	5.7	1.5	2.9	4.1
	(29)	(57)	(54)	(129)	(149)	(63)	(55)	(48)	(16)

Note: The first values are the fitted values from the log-linear model while the second values are observed values. Figures in parentheses indicate the sample size.

The model is

$$\hat{m}_{ACE} = \hat{Y}_1 \hat{Y}_{1A} \hat{Y}_{2C} \hat{Y}_{3E}$$

Appendix 6.2

Hierarchical Log-linear Models Applied to Mean Children Ever Born by Age at First Marriage (A), Education Level (E) and Current Practice of Contraception (P), Currently Married Women 25-35 Years who Married before the Age of 25 Years, 1974 MFFS

	Malays			Chinese		
Model	df	deviance	mean deviance	df	deviance	mean deviance
Ø	32	248.6	7.8	30	218.3	7.3
A	29	37.6	1.3	27	56.6	2.1
E	30	174.0	5.8	28	131.2	4.7
P	30	245.9	8.2	28	214.3	7.7
A,E,P	25	12.6	0.5	23	12.9	0.6
E,P	28	164.6	5.9	26	123.4	4.8
A,E	27	24.8	0.9	25	16.6	0.7
A,P	27	28.7	1.1	25	54.9	2.2
AE,P	19	8.1	0.4	18	8.7	0.5
AE,AC	13	6.0	0.5	12	5.8	0.5
AE,AC,EC	9	3.6	0.4	8	4.3	0.5

df degrees of freedom

ADDITIONAL NOTES (CHAPTER 6)

Page numbers in brackets at the end of each note refer to the relevant page in the text of the thesis.

Note 1 : Graphs 6.1 and 6.2 basically indicate the relationship between period fertility and cohort fertility. As stated on p. 220, the last line of the first paragraph, 'For example, the period fertility of 1969-79 of both Malay and Chinese women was less than the respective cohort fertility of 1940-45'. (pp. 213-214)

Note 2 : As stated on p. 215, the age specific fertility rates for 1978-79 are assumed to apply where reproductive experience of a particular cohort is not available. This assumption had to be made, otherwise cohort total fertility rate could not be estimated. These rates, being the most recent available, are probably the most appropriate. The problem with using these rates is that future cohorts may not follow this particular set of experience. (p. 216)

Note 3 : Cohorts who had not completed their fertility could be either postponing births or stopping at a smaller family size. The conclusion that such cohorts may be postponing births is based on the proportion of completed fertility (that is, estimated total cohort fertility) that is achieved before the age of 30 years. (p. 220)

Note 4 : It is acknowledged that Tables 6.5 and 6.10 should have some control for exposure and should not have been presented at all as the results are misleading. Such a control may not make much difference to the results of Table 6.8 as these refer to completed fertility. Results by such a control were not presented for these tables because, as stated in the thesis, of the number of cases. (p. 224, 231)

Note 5 : Reverse causality between contraceptive use and fertility was considered and this is presented on the last few lines of the first paragraph on p. 257. (p. 257)

Note 6 : Women not practising contraception have fewer children than those who did possibly because they have had the number of children they wanted. Further, less fertile or infecund women will tend not to practise contraception. (p. 258)

[1] The lengthening of menstruating intervals is evidence of increasing contraceptive practices. (p. 223)

[2]The expected completed families of women below the age of 45 years was obtained by only including women in the survey who said they did not want any more children. Such a measure may not be very reliable since these women may change their mind later. It is, however, felt that such a measure is more reliable than one obtained from all women, that is by adding the number of additional children wanted to the existing number of children. This is because the latter requires an estimate of the additional number of children wanted while no such estimate is required for the former. (p. 225)

[3]The control for duration contained in DRAT means that age at marriage determines the particular age range over which the fertility takes place. If age at marriage is 17 years and a controlled duration is 15 years then the fertility described is between ages 17 and 32 years - if age at marriage is 20 years then the fertility described is that between ages 20 and 35 years. (pp. 226-228)

[4]Women may also work because it was necessary to do so, that is a result of larger family size. (p. 229)

[5]Malay women who married at young ages tended to have a higher probability of divorce than those who married at older ages (rf. Chap. 5). This probably explains the smaller difference in mean CEB of those who married late compared with those married early. For the Chinese women, the number who had their marriages dissolved was negligible. (p. 247)

[6]It would be useful to look at parity specific use of contraception. Unfortunately the number of cases does not allow this further control. (p. 258)

[7]It has been suggested on p. 220 and elsewhere, that if women are postponing marriage and hence births, period fertility would decline faster than cohort fertility. Evidence presented in this chapter and in Chap. 5 indicates that women in Peninsular Malaysia are in fact postponing both marriage and births; therefore period fertility is declining faster than cohort fertility, for the reasons already mentioned. The conclusion that education is an important explanatory variable while work status and migration status are not important, comes largely from the multivariate analyses. Education would be important in affecting the fertility differential because, besides changing the attitudes towards family size, it also increases a woman's capability to earn a higher income and be employed outside her home. Also, a higher level of education would mean an older age at marriage. The conclusions about the lack of importance of work status and migration status must be regarded as tentative because of the very simplified definition of these variables in the survey. Moreover, variables such as these, unlike education, are very difficult to measure, as they are more subject to change during the life cycle. They are therefore not always recorded in the survey for a time period that is relevant to the determination of fertility. In many other surveys as well, education is found to be a more important determinant of fertility than variables such as work status and migration status. (p. 261)

CHAPTER 7

NUPTIALITY BEHAVIOUR AND BIRTH TIMING

A number of studies have used birth interval data to investigate the relationship between age at marriage and subsequent fertility. Some of these studies are mentioned in Section 1.3.2. Studies such as McDonald *et al.* (1980) have found that in high fertility societies, women who marry late have higher age specific marital fertility rates at all ages than those who marry at younger ages. The age at entry, that is the age at marriage or the age at first birth, is found to be an important determinant of the tempo of childbearing (Hobcraft and Casterline, 1982). In studies such as Casterline and Trussell (1980) the importance of age at first birth in affecting fertility behaviour and hence education and employment is acknowledged and estimates of the age at first birth process are carried out for a number of countries.

Not much work has been carried out to analyse birth intervals using Malaysian data. P. C. Tan (1981a) using the 1974 MFFS data found that premarital conception seems to have increased among girls below 20 years of age who married recently. However, evidence from this study and Table 2.1.1, Chander *et al.* (1977) indicates that premarital births were generally insignificant in Malaysia.* The study

---

*The figure obtained probably understates the real incidence of premarital first birth or conception as it is easy for most women to hide this by moving the date of the birth of the eldest child forward by a few months.

by Tan further found that women who had their first child when they were at least 19 years old tend to have their first, second and third child faster than women who had their first child at younger ages. Trussell et al. (1983) used WFS data from the Philippines, Malaysia and Indonesia to study the effect of socioeconomic and biological factors on the length of birth intervals. They found, using proportional hazards models on the last open and closed birth intervals, that birth order was not a significant covariate once biological and socioeconomic factors were controlled. Also the length of the previous interval had important positive effects on the subsequent intervals, with control for other variables. Female education was found to be unimportant as a determinant of birth intervals but ethnicity was found to be important in Malaysia. The major limitation of this study is the use of the last closed and open intervals from survey data for analysis. The biases that result from using these intervals are referred to elsewhere in the present study.

7.1. DIFFERENCES IN MEAN AGE AT FIRST BIRTH[1]

For both the Malay, except the 1925-29 and 1930-34 birth cohorts, and the Chinese birth and marriage cohorts (rf. Table 7.1) the trend is towards an increasing age at first birth. As premarital first births still form an insignificant proportion of total births, the increase in age at first birth can be said to be largely a result of the increase in age at first marriage. If age at first marriage

Table 7.1

Mean Age at First Birth of Women Aged 25 Years and Over who Married Before the Age of 25 Years for Various Birth and Marriage Cohorts by Race and Age at First Marriage, 1974 MFFS

	Race/ Age at First Marriage									
			Malays					Chinese		
	Total	lt 17	17,18	19,20	21-24	Total	lt 17	17,18	19,20	21-24
Birth Cohorts										
1945-49	19.0	16.5	18.4	20.6	22.8	21.6	*	18.3	20.2	23.1
1940-44	18.7	16.8	18.7	20.2	23.0	21.3	*	18.5	20.3	23.4
1935-39	18.4	16.6	18.8	20.7	23.2	20.5	*	18.6	20.3	23.2
1930-34	18.1	16.6	19.1	20.6	*	20.2	*	18.5	20.3	23.2
1925-29	18.5	17.1	19.8	21.2	23.8	20.1	16.5	18.4	20.5	23.4
Marriage Cohorts										
1965-69	20.6	*	18.4	20.6	23.3	22.0	*	*	20.3	23.3
1960-64	18.9	16.8	18.7	20.2	22.6	21.2	*	18.4	20.2	23.4
1955-59	18.4	16.7	18.6	20.7	23.1	20.3	*	18.3	20.2	23.0
1950-54	18.0	16.6	19.0	20.4	23.0	20.1	*	18.6	20.3	23.2
1945-49	18.2	16.8	19.4	21.3	23.8	20.0	*	18.4	20.4	23.5
Before 1945	17.4	16.9	19.8	*	*	18.3	17.2	18.7	*	*

lt less than
* less than 30 cases

Table 7.2

Mean Age at First Birth of Malay and Chinese Women Aged 25 Years and Over who Married before 25 Years of Age by Various Characteristics, 1974 MFFS

	Race/ Age at First Marriage							
	Malays				Chinese			
	lt 17	17,18	19,20	21-24	lt 17	17,18	19,20	21-24
	16.8	18.9	20.6	23.1	16.8	18.5	20.3	23.3
Contraceptive Use Status								
Never used	16.9	19.1	20.8	23.3	16.9	18.6	20.4	23.5
Ever used	16.5	18.6	20.3	22.8	16.8	18.4	20.3	23.2
Work Status								
Never worked	16.7	18.6	20.4	23.1	16.7	18.5	20.4	23.4
Ever worked	16.8	19.1	20.8	23.1	16.9	18.5	20.3	23.3
Education Level								
None	16.8	19.2	20.6	23.2	16.6	18.6	20.5	23.2
1+ years	16.7	18.7	20.7	23.0	17.1	18.3	20.3	23.3
Migration Status								
Migrant	16.4	18.5	20.4	23.1	16.8	18.5	20.2	23.3
Non-migrant								
Towns	16.2	18.9	20.9	23.4	16.5	18.3	20.4	23.3
Rural	16.9	19.0	20.7	23.0	17.2	18.5	20.4	23.2
Work Status in First Birth Interval								
Worked	17.0	19.3	20.9	23.1	16.8	18.5	20.3	23.3
did not work	16.4	18.7	20.7	22.9	16.9	18.6	20.4	23.0

lt less than

is controlled, it is clearly seen that mean age at first birth across both birth and marriage cohorts has remained more or less the same, except for Malay women married at the age of 17-18 years where mean age at first birth seems to have declined from older to younger birth or marriage cohorts.

Table 7.2 clearly shows that mean age at first birth increases with increasing age at first marriage. By age at first marriage categories, the table also shows that women who had never used contraception had a marginally higher age at first birth than women who used contraception. Perhaps the higher age at first birth of women who had never used contraception may have resulted from adolescent subfecundity, delay of consummation, less frequent intercourse or dissolution of marriage. As the use of contraception could have taken place at any time and probably not before the first birth, one can also postulate that perhaps women who used contraception were more fertile women. Work status (ever worked or never worked), education level and migration status also seem to have little effect on the mean age at first birth within age at first marriage categories. Work status in the first birth interval seems to have some effect on the age at first birth of Malay women. Malay women who worked in the first birth interval had their first child later than women who did not work. It is also possible that some women may not have worked because they had a child soon after marriage.

The above estimates not only do not cover the first birth experience of women aged less than 25 years at the time of the survey but also do not include the birth experience of those who married

after the age of 25 years. The Coale-McNeil marriage model is therefore used to estimate the mean age at first birth.

7.1.2. FITTING THE COALE-MCNEIL MARRIAGE MODEL TO AGE AT FIRST BIRTH DATA

A number of studies (such as Hobcraft and Trussell, 1980; Trussell et al., 1979; Rodriguez and Trussell, 1980) have investigated the ability of the marriage model, fitted earlier in Chapter 5 to age at first marriage data, to replicate the observed frequencies of first births by age of cohort. Almost all the studies, except for one or two, such as Hobcraft and Trussell, 1980, found that the marriage model provides a good fit to first birth data. The model is therefore fitted to first birth data of Malay and Chinese women separately. Table 7.3 presents the results obtained for the five birth cohorts of 1925-29 to 1950-54. Generally, the model fits the data well, except for the two younger Chinese birth cohorts of 1945-49 and 1950-54. Also the test of homogeneity is not significant at the 0.05 level for the 1950-54 Chinese birth cohort. If this group is ignored, the results indicate that the mean age at first birth of the Chinese women is rising over time. For the Malay women, there is a definite increasing trend starting from the 1935-39 birth cohort. The mean ages at first birth of the 1925-29 to the 1935-39 birth cohorts were more or less the same. Comparing the values for the Malay and Chinese women, and ignoring the 1950-54 birth cohort because of poor fit for the Chinese cohort, it is clear that except for the 1925-29 birth cohort, where the mean age at first birth of Malay and Chinese women were similar, Chinese women, on average, had their first birth

Table 7.3

Estimates of the Parameters of the Coale-McNeil Nuptiality Model Fitted to Grouped First Birth Data from the 1974 MFFS Individual Data

	$\hat{\mu}$	$\hat{\sigma}$	a_0	k	p values fit	p values homogeneity
Birth Cohorts						
Malays						
1950-54	22.5	5.0	13.9	0.8	0.100	0.070
	(0.7)	(0.5)	(0.2)	(0.1)		
1945-49	20.9	4.7	12.8	0.7	0.065	0.047
	(0.3)	(0.2)	(0.2)	(0.0)		
1940-44	20.0	4.2	12.7	0.6	0.118	0.164
	(0.2)	(0.2)	(0.2)	(0.0)		
1935-39	19.5	4.0	12.6	0.6	0.099	0.534
	(0.2)	(0.1)	(0.2)	(0.0)		
1930-34	19.3	4.1	12.2	0.6	0.097	0.698
	(0.2)	(0.2)	(0.2)	(0.0)		
1925-29	19.5	4.9	11.0	0.8	0.283	0.666
	(0.2)	(0.2)	(0.2)	(0.0)		
Chinese						
1950-54	20.7	4.5	12.9	0.7	0.000	0.000
	(0.5)	(0.4)	(0.3)	(0.1)		
1945-49	22.5	5.0	13.8	0.8	0.001	0.072
	(0.4)	(0.3)	(0.2)	(0.0)		
1940-44	21.9	4.9	13.4	0.7	0.087	0.509
	(0.3)	(0.2)	(0.3)	(0.0)		
1935-39	21.7	5.6	12.0	0.9	0.323	0.767
	(0.3)	(0.3)	(0.3)	(0.0)		
1930-34	20.6	4.7	12.4	0.7	0.421	0.821
	(0.3)	(0.2)	(0.3)	(0.0)		
1925-29	19.5	4.3	12.1	0.7	0.080	0.738
	(0.3)	(0.2)	(0.3)	(0.0)		

Table 7.4

Mean Age at First Birth of Malay and Chinese Women Obtained from Fitting the Coale-McNeil Nuptiality Model to Group Individual Data of Ever-married Women by Birth Cohorts and Various Characteristics, 1974 MFFS

	Malays						Chinese					
	1950-54	1945-49	1940-44	1935-39	1930-34	1925-29	1950-54	1945-49	1940-44	1935-39	1930-34	1925-29
Education Level												
No education	20.1	19.5	19.1	18.9	19.1	19.5	-*+	-*	20.3*	19.9	19.8	19.1
With education	23.0	21.2	20.5	20.1	19.7	19.4	18.9*+	20.8*	21.4*	21.4	20.3	18.9
Childhood Residence												
Village or estate	21.9	20.4	19.8	19.4	19.2	19.6	20.3*	22.2	21.2	21.4	20.0	19.3
Town	-	-	21.1	20.5	20.1	18.9	18.9*	-	21.8	20.9	20.3	18.8
Current Residence												
Rural	22.3	20.5	19.8	19.4	19.2	19.5	20.7*	21.6	21.4	21.3	19.9	19.3
Metropolitan or Small Towns	-	-	21.6	20.0	20.0	19.4	18.5*	21.7	21.2	20.9	20.0	18.6
Work Status in First Birth Interval												
Did not work	19.5	19.1	19.3	19.5	18.7	18.4	-*	20.0	20.0	20.4	19.3	19.2
Worked	21.3	21.2	20.0	19.7	19.7	20.2	19.0*	21.9	20.9	20.9	19.9	18.3

- mean not given because of large standard errors
* test for goodness of fit of model, not significant at 0.01 level
+ test for homogeneity of cohorts, not significant at 0.01 level

at a later age than Malay women. Generally, however, Malay women had their first births over a narrower range of ages.

Table 7.4 indicates that, except for the 1925-29 birth cohort, Malay and Chinese women who had some education, who were from urban areas and who worked in the first birth interval, from marriage to first birth, had their first birth at a later age than women who had no education, who were from rural areas and who did not work in the first birth interval, respectively. Within categories of these characteristics, except for the 1925-29 birth cohort, the trend in the age at first birth is increasing over cohorts, and the Chinese mean age at first birth is generally higher than the Malay mean age at first birth. These observed patterns of age at first birth agree with the observed patterns of age at first marriage, that is the mean age at first birth is higher for women who marry later. One interesting observation is that although the Chinese women generally married much later than the Malay women, they tended to have their first birth, on average, at the same age or only slightly later than the Malay women. This is clearly shown in the next section, that is, Chinese women, on average, tended to have their first child at a shorter duration after first marriage than Malay women.

The next section looks at the timing of births, particularly with reference to age at first marriage. In addition, the influence of other relevant factors on the timing of births will be taken into account. The life table technique is used to overcome the 'censoring' problem, that is when birth intervals are incomplete at the date of interview. Masitah (1982) found that birth history data from the 1974 MFFS are generally of reasonable quality. Slight omission of births,

particularly female births, was found for the 45-49 age group and, for the 40-44 age cohort, there was evidence of displacement of births from the period 25-29 to the period 20-24 years before the survey. Dating of births was found to be reasonably complete with 86 percent of the dates given in calendar year and month and 14 percent in calendar year with month missing. Missing months were imputed (WFS/Tech. 1434, 1980:3). In order to reduce the problem of omission or displacement of births and the problem of selectivity bias* all analyses are restricted to birth intervals started 3-20 years before the survey and exclude women above the age of 44 years at the time of survey.[2] The life tables are constructed using the subprogram 'SURVIVAL' from SPSS (Statistical Package for Social Sciences).

The first three birth intervals will be studied. Analyses of the last closed and open birth intervals will not be carried out because such analyses will lead to serious biases from cross-sectional data (rf. Srinivasan, 1967; Leridon, 1969).

Before looking at the results for each birth interval in detail the results for the mean total birth interval as presented in Table 7.5 will be discussed.** The mean total birth interval for Malays is about 32 months, that is about nine months longer than the Chinese birth interval. The effect of education is apparently to shorten the

---

*Inclusion of all available intervals in the analyses will result in under-representation of older cohorts (as a certain proportion of the women would have died), over-representation of younger ages at the beginning of intervals (as younger birth cohorts would not have a chance to initiate intervals at older ages), and intervals initiated in recent periods would not have had the chance of closing. A discussion on selectivity bias can be found in Rindfuss et al., 1982.

**Note that there will be a birth order effect in the estimates of the birth intervals, that is any group tending to have higher order births will have longer birth intervals.

Table 7.5

Mean Total Birth Interval in months of Ever-married Women Aged Below 45 Years** Who Had at Least One Child by Race by Various Characteristics, 1974 MFFS

Characteristics	Malays	Chinese
Race	31.7	23.4
Age at First Marriage		
Less than 17 years	36.7	27.5
17,18	27.2	24.1
19,20	26.4	22.9
21+	24.0	22.3
Age at First Birth		
Less than 20 years	30.7	23.7
21+	34.8	23.3
Education Level		
None	40.0	25.4
1-6	28.4	22.3
7+	21.2	23.1
Work Status		
Ever worked	33.2	23.0
Never worked	28.8	24.9
Migration Status		
Migrant	28.7	23.1
Non-migrant		
Urban	30.6	24.6
Rural	32.5	22.7
Birth Cohorts[3]		
1950-54	19.7	13.9
1945-49	25.1	18.0
1940-44	31.2	22.8
1935-39	34.8	25.9
1930-34	37.1	27.6
Marriage Cohorts[3]		
1965-69	23.5	20.5
1960-64	29.6	24.7
1955-59	31.1	23.2
1950-54	35.3	27.8

* less than 30 cases

** Women aged 45-49 years were excluded because Masitah (1982) found evidence of birth omissions, particularly female births, in this group.

average birth interval for both the Chinese and the Malays but Chinese women with more than 7 years of education had an average interval that was one month longer than those with 1-6 years of education. While working seems to lengthen the average birth interval of the Malays, it shortens the average birth interval of the Chinese. Malay migrants had shorter average birth intervals than rural and urban non-migrants. Perhaps the longer birth interval of the rural non-migrants may have resulted from a longer first birth interval, a result of young age at first marriage and hence adolescent subfecundity and possibly higher divorce rate. Chinese urban non-migrants had longer average birth intervals than rural non-migrants or migrants. Older age at first marriage seems to shorten the average birth interval. The Chinese women had about similar average birth intervals regardless of whether the age at first birth was above or below 20. Malay women who had the first birth above 19 years appear to have longer average birth intervals than those who had the first birth below 20 years. The pattern by birth and marriage cohorts indicates longer average birth intervals for older cohorts, a result probably influenced by the long first birth interval of women married at very young ages in the older cohorts. Also longer birth intervals may have resulted from the higher number of divorces because of young age at marriage.[4]

7.2. MARRIAGE TO FIRST BIRTH INTERVAL

Table 7.6 presents the cumulative proportion of women having a

Table 7.6

Cumulative Proportion of Women Having a Birth by Selected Interval Lengths in Months Since First Marriage by Selected Characteristics Using Life Table Technique, 1974 MFFS

Characteristics	9	12	18	24	30	36	median interval
Race							
Malays	0.0689	0.2752	0.5549	0.6917	0.7921	0.8522	16.8
	(0.0711)	(0.2862)	(0.5764)	(0.7172)	(0.8230)	(0.8857)	(16.4)
Chinese	0.1526	0.4157	0.7329	0.8569	0.9102	0.9380	13.6
	(0.1526)	(0.4160)	(0.7329)	(0.8575)	(0.9113)	(0.9395)	(13.6)
Age at First Marriage							
Malays							
less than 17 years	0.0537	0.1937	0.4332	0.5942	0.7212	0.7958	20.5
17,18	0.0808	0.3210	0.6351	0.7460	0.8476	0.8984	15.4
19,20	0.0645	0.3190	0.6487	0.7849	0.8602	0.9104	15.3
21+	0.0920	0.3650	0.6499	0.7656	0.8249	0.8724	14.8
Chinese							
less than 17 years	*	*	*	*	*	*	*
17,18	0.1659	0.4170	0.7713	0.8969	0.9462	0.9686	13.4
19,20	0.1870	0.4771	0.7557	0.9008	0.9466	0.9580	12.5
21+	0.1268	0.4903	0.7094	0.8291	0.8860	0.9188	14.1
Education							
Malays							
None	0.0779	0.2505	0.5137	0.6484	0.7305	0.7958	17.7
1+	0.0658	0.2842	0.5699	0.7076	0.8138	0.8721	16.5
Chinese							
None	0.1211	0.3416	0.6677	0.8261	0.9006	0.9224	14.9
1+	0.1636	0.4417	0.7561	0.8684	0.9134	0.9433	13.1
Work Status							
Malays							
Ever-worked	0.0714	0.2676	0.5396	0.6721	0.7719	0.8296	17.1
Never worked	0.0646	0.2892	0.5831	0.7262	0.8277	0.8923	16.3
Chinese							
Ever-worked	0.1633	0.4257	0.7405	0.8571	0.9096	0.9368	13.4
Never worked	0.1048	0.3712	0.6987	0.8559	0.9127	0.9432	14.4
Migration Status							
Malays							
Migrant	0.0743	0.3750	0.6351	0.7635	0.8446	0.8953	14.9
Non-migrant							
Urban	0.0667	0.3407	0.6519	0.7630	0.8370	0.8815	15.1
Rural	0.0680	0.2475	0.5282	0.6693	0.7764	0.8401	17.5
Chinese							
Migrant	0.1281	0.3926	0.7355	0.8595	0.9050	0.9401	13.9
Non-migrant							
Urban	0.1547	0.4392	0.7155	0.8315	0.8812	0.9144	13.3
Rural	0.1796	0.4223	0.7451	0.8762	0.9417	0.9563	13.4

(cont'd Table 7.6)

Period							
Malays							
1970-74	0.0361	0.2230	0.4984	0.6557	0.7934	0.8623	18.1
1965-69	0.0766	0.3176	0.6014	0.7285	0.8041	0.8649	15.9
1960-64	0.0678	0.2518	0.5278	0.6707	0.7748	0.8547	17.4
1955-59	0.0889	0.3149	0.6514	0.8173	0.9087	0.9399	15.3
Chinese							
1970-74	0.1643	0.3897	0.6620	0.7934	0.8873	0.9296	14.4
1965-69	0.1816	0.4323	0.7291	0.8588	0.8991	0.9395	13.4
1960-64	0.1294	0.4353	0.7725	0.9059	0.9608	0.9843	13.2
1955-59	0.1215	0.4132	0.7951	0.9271	0.9722	0.9861	13.3
Birth Cohorts							
Malays							
1950-54	0.0400	0.2618	0.5818	0.7273	0.8545	0.9018	16.5
1945-49	0.0822	0.2986	0.5792	0.6974	0.7976	0.8517	16.3
1940-44	0.0592	0.2437	0.5011	0.6492	0.7631	0.8292	18.0
1935-39	0.1142	0.3504	0.6299	0.7362	0.8071	0.8622	15.2
1930-34	*	*	*	*	*	*	*
Chinese							
1950-54	*	*	*	*	*	*	*
1945-49	0.1600	0.4400	0.7127	0.8545	0.9127	0.9491	13.3
1940-44	0.1354	0.3938	0.7662	0.8892	0.9262	0.9477	13.7
1935-39	0.1004	0.3475	0.7220	0.8456	0.9112	0.9344	14.4
1930-34	*	*	*	*	*	*	*
Marriage Cohorts							
Malays							
1965-69	0.0657	0.3169	0.6408	0.7770	0.8592	0.9108	15.4
1960-64	0.0700	0.2750	0.5550	0.6775	0.7650	0.8275	16.8
1955-59	0.0765	0.2556	0.4963	0.6399	0.7575	0.8302	18.2
Chinese							
1965-69	0.1895	0.4289	0.7368	0.8632	0.9132	0.9395	13.4
1960-64	0.1204	0.3880	0.7191	0.8462	0.8930	0.9264	14.0
1955-59	0.1235	0.4157	0.7380	0.8645	0.9277	0.9488	13.6

( ) excludes women who had the child in the second marriage

* value not calculated because sample size less than 100 cases. Smith (1980:22) showed that the rates obtained using the life table technique fluctuate substantially for number of cases near or below 100.

birth by selected interval lengths* since first marriage, using the life table technique. About seven percent of Malay women compared with 15 percent of Chinese women had a premarital first birth or conception, that is a birth that occurs less than 9 months after marriage. At all interval points, a greater proportion of Chinese women than of Malay women had had a first birth. For example, 94 percent of Chinese women compared with 85 percent of Malay women had had a first birth within 3 years after the first marriage. The median interval from first marriage to first birth was 17 months for Malay women and 14 months for Chinese women. If women whose first marriage had dissolved before the birth of the first child are excluded, the above general pattern remains. The only difference is that the proportion of women who had a child at each specified interval increases slightly for both the Malays and Chinese; more for the Malays as Malays have a higher tendency for divorce and remarriage (rf. Chapter 5). For example, the proportion of Malay women who had a first child three years after marriage is 89 percent, if women whose first marriage had dissolved before the birth of the first child are

---

*Interval lengths are obtained by subtracting the date of entry to risk from the dates of termination or interview. Subtraction of dates gives an approximate interval length that is sometimes wrong. For example, the interval one to two months may represent from one day (last day of the ith month to the first day of i+1 month) to 60 days (first day of ith month to last day of i+1 month). Smith (1980, Appendix I) demonstrated that beyond the first few intervals (within an interval), biases will be trivial in nearly all cases. Linear interpolation between adjacent calculated rates may be used to find an approximation to the whole interval rate but as the biases in later intervals have been shown to be trivial, further calculations will not be carried out.

Analysis of higher order births takes into account multiple births by considering intervals between these births as of length zero. For example, a woman with twins is considered to have an interval of length zero between the first and second child. If multiple births are taken as one birth, the results remain basically the same, as the proportion of multiple births in relation to total births is negligible.

excluded, but the median interval from first marriage to first birth for both the Malays and Chinese women remained at about 16 and 14 months, respectively. As the observed patterns and the estimated median interval, from marriage to first birth, remain more or less the same, only single decrement life tables are constructed, that is only the event of a subsequent birth is considered, not the risk of marital dissolution. Appendix 7.1 presents the probability of having a first birth for women whose first marriage had dissolved.

Premarital first births or conceptions for Chinese women seem to be higher for those who married at younger ages, that is about 17-19 percent for those who married at 17-20 years of age compared with 13 percent for those who married after 20 years of age. There is a strong possibility therefore that many of the younger girls married because they were pregnant. The proportion of Malay women who had premarital births or conceptions remained at about 6 to 9 percent, regardless of the age at first marriage.

If women who married below 17 years of age are excluded, as a number of these women could not have had a child because of adolescent sterility, for both Malay and Chinese women, a smaller proportion of the women who married after the age of 20 years had their first child in the second or third year after first marriage than women who were married at the ages of 17-20 years. The pattern is reversed for periods of 12 months or less. For both the Malay and Chinese women, for all age at first marriage categories, the median intervals from marriage to first birth are about 15 months and 13-14 months, respectively. Age at first marriage therefore appears to have little effect on the timing of the first birth, if those who married below 17

years of age are excluded. If these women are included, young age at marriage would have some effect in lengthening the first birth interval.

The effect of education on the timing of the first birth is expected to work in the following way. First, education will delay the age at marriage and this tends to increase the probability of having a premarital first birth or conception. An older age at first marriage is postulated to negatively affect the first birth interval as a woman may feel she will be too old to have children later. Other birth intervals may also be shortened in order to finish the childbearing process. On the other hand, the presence of servants and relatives to help in the care of children may make it unnecessary for an educated and/ or working woman* to space her children closer together so that she may concentrate on her work and career.

From Table 7.6, uneducated Malay women show a slightly higher proportion of premarital births or conceptions as compared with educated women. Educated Chinese women, on the other hand, were more likely to have premarital births or conceptions than uneducated women. For both Malay and Chinese women, educated women seem to have shorter birth intervals than uneducated women. The difference is however not much, only about 1 month. Observations by work status indicate that a higher proportion of both Malay and Chinese women who had ever worked had premarital births or conceptions compared with women who had never worked. Malay women who never worked had a shorter median interval than those who worked, the difference being about one month. Chinese women, however, showed a reverse pattern, that is those who worked had

---

*Women who are educated have a higher tendency to work outside the home for pay.

a shorter birth interval than those who did not.

The place of residence is expected to have some effect on the timing of first births. Rural areas are more traditional and girls tend to be married at young ages and this may result in longer intervals because of adolescent subfecundity. Further, as a result of less education, lower tendency to work outside the home and young age at marriage, rural women may not feel the urgency to have the first and subsequent child quickly. Many, particularly the Malays, may divorce even before they have had any children. Migrants are expected to have shorter birth intervals than rural non-migrants but longer birth intervals than urban non-migrants as they have both traditional and modern influences.

The pattern by migration status, as shown in Table 7.6, is different for the Malay and Chinese women. Malay migrants together with urban non-migrants had a median birth interval of 15 months while rural non-migrants had a median interval of 17 months. Chinese rural and urban non-migrants had a median birth interval of 13 months while migrants' median interval is half a month longer. Chinese non-migrants seem to have a higher probability of having premarital births or conceptions than migrants. The proportion of Malay women, both migrants and non-migrants, having premarital births or conceptions was roughly similar.

The pattern by birth cohorts indicates that the younger Chinese cohorts had more premarital births or conceptions compared with older cohorts. For Malay women, the pattern is reversed, that is the older cohorts had a slightly higher proportion of premarital births or conceptions than younger cohorts. The probability of having a first

birth at all durations since marriage shows a U-shape pattern across birth cohorts. If observation is restricted to the 1950-54 through the 1940-44 birth cohorts (for the Chinese women only 1945-49 and 1940-44 birth cohorts) a higher proportion of the younger birth cohorts had a birth within three years of marriage compared with older cohorts, and the first birth interval seems to be growing shorter from older to younger cohorts.

The pattern by marriage cohorts of Malay women is generally similar to that by birth cohorts. However, the proportion of Malay women who had a premarital birth appears constant across marriage cohorts. For the Chinese women, younger marriage cohorts indicate a higher probability of premarital first births or conceptions while the proportion of women who had a first birth within three years of marriage is roughly constant across marriage cohorts.

No consistent trend is observed across periods for Malay women but for Chinese women, from about 18 months after marriage, the probability of a woman having a child in a selected interval was greater in the 1950s than in the 1970s. Therefore, women who had a child in recent periods tended to do so at a longer interval after marriage. This is probably a result of selectivity bias as it is not possible for recent cohorts of women to have had a birth in the early periods. A woman aged 15-25 at the time of the survey in 1974 could not possibly have had a birth in 1955-59. It is however possible for older cohorts to have had births in the recent periods before the survey if these women married at older ages or postponed their births. The birth experience of women in recent cohorts who marry late will not be included. Thus the birth experience in the early periods will

Table 7.7

Cumulative Proportion of Women Having a Second Birth by Selected Interval Lengths in Months Since First Birth by Selected Characteristics Using Life Table Technique, 1974 MFFS

Characteristics	12	18	24	30	36	median interval
Race						
Malays	0.0433	0.2245	0.4102	0.5865	0.7087	27.1
	(0.0453)	(0.1383)	(0.3328)	(0.5290)	(0.6707)	(26.1)
Chinese	0.0598	0.4131	0.6557	0.7836	0.8451	20.2
	(0.0711)	(0.2518)	(0.5536)	(0.7232)	(0.8118)	(19.8)
Age at First Marriage						
Malays						
less than 17 years	0.0403	0.1991	0.3636	0.5501	0.6962	28.4
17,18	0.0383	0.2464	0.4545	0.6507	0.7536	25.4
19,20	0.0595	0.2500	0.4722	0.6111	0.7143	25.2
21+	0.0453	0.2474	0.4321	0.5819	0.6760	26.7
Chinese						
less than 17 years	*	*	*	*	*	*
17,18	0.0426	0.4468	0.7404	0.8596	0.9149	19.1
19,20	0.0805	0.4943	0.7356	0.8621	0.9042	18.1
21+	0.0516	0.3563	0.5828	0.7234	0.7875	21.8
Age at First Birth						
Malays						
less than 21 years	0.0435	0.2239	0.4071	0.5993	0.7353	26.9
21+	0.0492	0.2240	0.4098	0.5519	0.6557	27.8
Chinese						
less than 21 years	0.0695	0.5000	0.7715	0.8609	0.9238	18.0
21+	0.0522	0.3669	0.5983	0.7400	0.8060	21.5
Education						
Malays						
None	0.0248	0.0904	0.2535	0.4450	0.5762	29.8
1+	0.0515	0.2554	0.3497	0.5408	0.6860	25.8
Chinese						
None	0.0704	0.2845	0.6012	0.7889	0.8592	18.6
1+	0.0558	0.2312	0.5330	0.6993	0.7984	20.3
Work Status						
Malays						
Ever-worked	0.0400	0.2050	0.3750	0.5592	0.6983	28.1
Never-worked	0.0639	0.4108	0.6572	0.7830	0.8438	20.2
Chinese						
Ever-worked	0.0496	0.2624	0.4784	0.6400	0.7280	19.9
Never-worked	0.0427	0.4231	0.6496	0.7863	0.8504	19.8
Migration Status						
Malays						
Migrant	0.0539	0.2862	0.5051	0.6667	0.7374	23.9
Non-migrant						
Urban	0.0709	0.3150	0.4724	0.5906	0.6614	25.4
Rural	0.0385	0.2033	0.3845	0.5692	0.7068	27.8

(cont'd Table 7.7)

Chinese						
Migrant	0.0546	0.4433	0.6723	0.7878	0.8592	19.5
Non-migrant						
Urban	0.0583	0.3120	0.5335	0.6880	0.7434	23.1
Rural	0.0673	0.4638	0.7406	0.8603	0.9152	18.8
Survival of the Previous Child						
Malays						
died within 1 year	0.2061	0.4485	0.6182	0.7576	0.8303	19.8
survived longer than 1 year	0.0271	0.2023	0.3895	0.5695	0.6966	27.7
Chinese						
died within 1 year	*	*	*	*	*	*
survived longer than 1 year	0.0544	0.4082	0.6539	0.7806	0.8427	20.2
Period						
Malays						
1970-74	0.0359	0.1108	0.2485	0.4671	0.6437	28.0
1965-69	0.0328	0.2499	0.3513	0.5457	0.7119	25.6
1960-64	0.0442	0.1377	0.3273	0.5013	0.6545	27.0
1955-59	0.0751	0.1792	0.4220	0.6647	0.8064	23.0
Chinese						
1970-74	0.0601	0.1979	0.4488	0.6254	0.7456	22.5
1965-69	0.0510	0.2483	0.6156	0.7993	0.8946	18.7
1960-64	0.0905	0.3086	0.6049	0.8025	0.8683	18.8
1955-59	0.0573	0.2819	0.4344	0.8238	0.9163	18.2
Marriage Cohorts						
Malays						
1965-69	0.0540	0.2571	0.4447	0.6401	0.7326	25.7
1960-64	0.0496	0.2454	0.4256	0.6162	0.7337	26.3
1955-59	0.0554	0.2259	0.4312	0.5893	0.7187	26.6
Chinese						
1965-69	0.0654	0.4169	0.6322	0.7548	0.8174	20.3
1960-64	0.0714	0.4456	0.6633	0.8061	0.8571	19.5
1955-59	0.0513	0.3942	0.6923	0.8205	0.8718	20.1
Birth Cohorts						
Malays						
1950-54	0.0511	0.2045	0.4148	0.6534	0.7443	26.1
1945-49	0.0443	0.2439	0.4390	0.6053	0.7273	26.2
1940-44	0.0411	0.2534	0.4132	0.5890	0.7443	27.0
1930-34	0.0179	0.1071	0.2143	0.3214	0.4821	38.0
Chinese						
1950-54	*	*	*	*	*	*
1945-49	0.0529	0.4581	0.6960	0.8238	0.8811	19.1
1940-44	0.0573	0.4490	0.6879	0.8089	0.8631	19.3
1935-39	0.0370	0.3852	0.6407	0.7778	0.8481	20.7
1930-34	0.0734	0.2936	0.5780	0.7156	0.7706	22.4

( ) excludes women who had the second child in the second marriage
* less than 100 cases

be that of older cohorts. In the recent periods, only the birth experience of women in young cohorts who marry at young ages and women from older cohorts who marry at older ages or who postponed births will be included. The longer interval in recent periods may not only have resulted from adolescent subfecundity of women who marry at young ages but also from women postponing births and the older age sterility of women who marry at older ages.

7.3. FIRST TO SECOND BIRTH INTERVAL

Compared to Malay women, Chinese women (rf. Table 7.7) had a higher probability of having the second child at each interval since the first birth (up to three years). The median second birth interval was about 27 months for Malay women and about 20 months for Chinese women.

The proportion of Malay women who had a second birth within 24 months of the first birth is not influenced by whether the first birth occurred at the age of 20 years or less or 21 years or more. However, Malay women who had their first child at the age of 20 years or less had a higher probability of having the second child within two and a half and three years than women who had their first birth above the age of 20 years. Chinese women who had the first child below 21 years of age had a higher probability of having their second child, at all intervals since the first birth, than women who had the first child above 20 years of age. By age at first birth categories, the Malay second birth interval was relatively longer than the Chinese interval by 6-9 months.

Educated Malay women had shorter second birth intervals than uneducated women. Chinese women, however, showed a reverse pattern, that is uneducated women had marginally shorter birth intervals than educated women. The Chinese pattern by work status indicates roughly similar average birth intervals for the two groups. Malay women who worked had an average interval 8 months longer than those who did not work.

Chinese rural migrants had the shortest second birth interval, about 19 months, compared with migrants, about 20 months, and urban non-migrants, about 23 months. Malay rural non-migrants, on the other hand, had the longest second birth interval, about 28 months, compared with migrants and urban non-migrants, 24 and 25 months, respectively.

Age at first marriage appears to have some effect on the second birth interval, that is those who married later had a longer interval than those who married earlier, excluding those who married before 17 years because of teenage subfecundity. On average, Chinese women who married after 20 years of age had the second child 3-4 months later than those who married earlier. Malay women who married at the age of 21 years or over on average had the second child one month later than women who married early.

The patterns by birth and marriage cohorts indicate a fall, from older to younger cohorts, in the lengths of the second birth interval for both Malay and Chinese women; Chinese marriage cohorts indicate roughly similar birth intervals of about 20 months. The pattern of birth intervals by period seems to indicate that women who had their second birth 5 years before the survey had a longer interval than those who had their second child before 1970. Apart from the

selectivity bias described earlier, the longer birth interval may be a result of greater contraceptive use after 1967, when the National Family Planning Programme was introduced.

For Malay women, the effect of child mortality reduces the interval by 8 months, from 28 months to 20 months. The Chinese sample containing women whose first child died before one year of age is too small to study the effect of mortality.

7.4. SECOND TO THIRD BIRTH INTERVAL

Chinese women had a higher probability of having a third child at all intervals after the second child compared with Malay women (rf. Table 7.8). The median interval was 24 months for the Chinese but was 30 months for the Malays. If women who married before 17 years of age are disregarded because of adolescent sterility, Malay women who married at 19-20 years of age had a higher probability of having a third child within 12 to 18 months after the second child than women who married after 20 years or before 19 years of age. But from birth intervals of 24 months onwards, Malay women who married at younger ages started to show a higher probability of having a third child than women who married at older ages, such that at intervals from 36 months onwards, a higher proportion of these women had already had a third child compared with women who married at older ages. The median interval was shortest for women who married at younger ages. The above pattern is also observed for Chinese women except that the negative relationship between the age at first marriage and the probability of having a third child within a given interval is obvious

Table 7.8

Cumulative Proportion of Women Having a Third Birth by Selected Interval Lengths in Months Since Second Birth by Selected Characteristics Using Life Table Technique, 1974 MFFS

Characteristics	12	18	24	30	36	Median Interval
Race						
Malays	0.0394	0.1621	0.3127	0.4939	0.6422	30.3
Chinese	0.0444	0.3037	0.5028	0.6593	0.7417	23.9
Age at First Marriage						
Malays						
less than 17 years	0.0407	0.1424	0.2698	0.4625	0.6338	31.3
17,18	0.0396	0.1794	0.3694	0.5646	0.6992	28.0
19,20	0.0455	0.2020	0.3485	0.4949	0.6313	30.2
21+	0.0278	0.1806	0.3657	0.5046	0.5880	29.8
Chinese						
less than 17 years	*	*	*	*	*	*
17,18	0.0498	0.3112	0.5519	0.7220	0.8340	22.7
19,20	0.0385	0.3333	0.5128	0.6795	0.7735	23.6
21+	0.0528	0.2935	0.4755	0.6145	0.6732	25.1
Age at First Birth						
Malays						
less than 21 years	0.0401	0.1525	0.3040	0.5054	0.6794	29.8
21+	0.0329	0.1671	0.3315	0.4603	0.5589	32.4
Chinese						
less than 21 years	0.0361	0.3177	0.5704	0.7509	0.8448	22.3
21+	0.0521	0.3073	0.4879	0.6387	0.7002	24.5
Education						
Malays						
None	0.0435	0.1274	0.2504	0.4243	0.5847	32.8
1+	0.0368	0.1841	0.3522	0.5382	0.6789	28.8
Chinese						
None	0.0556	0.2889	0.5389	0.7083	0.8139	23.1
1+	0.0389	0.3102	0.4840	0.6342	0.7051	24.6
Work Status						
Malays						
Ever-worked	0.0376	0.1486	0.2801	0.4654	0.6166	31.4
Never-worked	0.0432	0.1910	0.3820	0.5532	0.6955	28.1
Chinese						
Ever-worked	0.0467	0.3081	0.4971	0.6534	0.7340	24.1
Never-worked	0.0359	0.2870	0.5247	0.6816	0.7713	23.4
Migration Status						
Malays						
Migrant	0.0332	0.2103	0.4022	0.5424	0.6458	28.2
Non-migrant						
Urban	0.0431	0.2241	0.4052	0.5259	0.6379	28.7
Rural	0.0403	0.1470	0.2866	0.4813	0.6418	30.7

(cont'd Table 7.8)

Chinese						
Migrant	0.0401	0.3113	0.5354	0.6910	0.7807	23.1
Non-migrant						
Urban	0.0405	0.2703	0.4054	0.5169	0.5980	29.1
Rural	0.0628	0.3222	0.5444	0.7389	0.8139	22.8
Survival of previous child						
Malays						
Died within 1 year	0.1849	0.4041	0.6096	0.7466	0.8425	20.8
Survived longer than 1 year	0.0259	0.1398	0.2853	0.4706	0.6237	31.2
Chinese						
Died within 1 year	*	*	*	*	*	*
Survived longer than 1 year	0.0404	0.2913	0.4971	0.6538	0.7375	24.1
Period						
Malays						
1970-74	0.0341	0.1176	0.2739	0.4427	0.5882	32.4
1965-69	0.0314	0.1597	0.3194	0.5209	0.6911	40.6
1960-64	0.0362	0.1938	0.3566	0.5607	0.7597	28.2
1955-59	0.0638	0.2248	0.4396	0.6678	0.8188	25.6
Chinese						
1970-74	0.0233	0.2372	0.3953	0.5767	0.6837	27.5
1965-69	0.0649	0.3810	0.5628	0.7619	0.8442	21.9
1960-64	0.0611	0.3624	0.6201	0.7598	0.8472	21.2
1955-59	0.0462	0.3744	0.6308	0.8051	0.8923	20.9
Marriage Cohorts						
Malays						
1965-69	0.0489	0.2133	0.3733	0.5822	0.6711	27.6
1960-64	0.0257	0.1486	0.3114	0.5257	0.6657	29.3
1955-59	0.0332	0.1709	0.3469	0.4923	0.6735	30.3
Chinese						
1965-69	0.0369	0.3165	0.5654	0.7004	0.7722	22.4
1960-64	0.0542	0.3069	0.5018	0.6606	0.7401	23.9
Birth Cohorts	0.0380	0.3165	0.5654	0.7004	0.7722	22.4
Malays						
1955-59	*	*	*	*	*	*
1950-54	*	*	*	*	*	*
1945-49	0.0432	0.1671	0.2999	0.4957	0.6571	30.2
1940-44	0.0393	0.1572	0.3022	0.4816	0.6560	30.6
1935-39	0.0378	0.1604	0.3229	0.4922	0.6526	30.3
1930-34	0.0450	0.2622	0.3153	0.5495	0.6216	28.7
Chinese						
1955-59	*	*	*	*	*	*
1950-54	*	*	*	*	*	*
1945-49	0.0507	0.3188	0.5217	0.7029	0.8116	23.4
1940-44	0.0412	0.3221	0.4869	0.6554	0.7116	24.5
1935-39	0.0425	0.2819	0.5367	0.6873	0.7683	23.1
1930-34	0.0491	0.2822	0.4110	0.5890	0.6564	27.0

* less than 100 cases

from 24 months. The pattern by age at first birth also indicates initially a higher probability of having the third child for women who had a first birth at 21 years of age and over than women who had the first child before the age of 21 years. However, for both the Malay and Chinese women, from 30 months after the second child, women who had the first birth before the age of 20 years showed a higher probability of having the third child. Thus, one can conclude that women who married young or had the first child early tended to be slower in having the third child in the period of about 18 months after the second child, but after 18 months, a greater proportion of these women had their third child than those who married at an older age or had their first child later.

Generally, women who never worked had shorter birth intervals than women who worked. For Chinese women, uneducated women showed a higher probability of having the third child than educated women at all intervals after 12 months from the second birth. Malay educated women, on the other hand, showed a higher probability of having a third child from 12 months after the previous child. The Malay pattern across migration categories indicates negligible differences. Chinese migrants and urban non-migrants had a higher probability than the rural non-migrants of having a third child within almost all the selected intervals after the second child. Occurrence of child mortality also increases the probability of having a third child for Malay women; the Chinese sample experiencing child mortality was too small for further analysis.

The pattern by period of birth indicates that a woman who had the third child in the recent periods, was slower in having this child than a woman who had the child in say, 1955-59.* The Chinese pattern by marriage cohorts supports this trend, that is younger marriage cohorts had a lower probability of having the third child in the selected interval than older marriage cohorts. Malay marriage cohorts also indicate roughly the same patterns but the younger cohorts showed a slightly higher probability of having the third child at all intervals less than 36 months. The patterns exhibited by birth cohorts showed no consistent trend but the range in birth intervals across cohorts for the Malays is about 2 months and about 4 months for the Chinese.

Thus, to summarise the results obtained from the analyses of the three birth intervals, one finds that a Malay woman took longer than a Chinese woman to have the first, second or third child. If women who married below 17 years are excluded, one finds that Chinese women maintained their shorter birth intervals. Comparison by age at first marriage categories, excluding those married before the age of 17 years because of adolescent subfecundity, indicates that regardless of the age at marriage, the median first birth interval of Malay women is about 15 months. However, Malay women who married at older ages tend to have longer second and third birth intervals than women who married at 17-18 years of age. Chinese women who married at the age of 21 years and over had longer first birth intervals as well. Longer second and third birth intervals are also experienced by women who had their first birth above the age of 20 years. The age at entry, either measured by age at first marriage or age at first birth, above 20

---

*Selectivity bias has probably affected the results.

years therefore has a positive effect on the timing of the second and third child of both Malay and Chinese women.

Uneducated women tended to have longer first birth intervals than educated women but the longer interval of the uneducated may partly be explained by adolescent sterility of women who married at very young ages. Although educated Malay women continued to have shorter second and third birth intervals, the Chinese educated women had longer second and third birth intervals than the uneducated women. The longer intervals of the Chinese educated women may partly be attributed to the fact that more of the Chinese women had higher education than the Malay women. Educated Malay women may possibly be 'catching-up' on their fertility.

While work status, that is ever worked, including those currently working, or never worked, did not have much effect on the timing of the first, second and third births of the Chinese women, Malay women who ever worked had longer first, second and third birth intervals. Malay migrants had similar birth intervals to urban non-migrants but Chinese migrants had birth intervals that were similar to rural non-migrants. Thus migration appears to shorten the length of birth intervals. Evidence from the data on whether the previous child survived up to one year indicates that the Malay second and third birth intervals were greatly shortened by the death of a previous child. For the Chinese women, some amount of fluctuation in the timing of the first, second and third births was observed across birth cohorts. For the Malay women, younger birth cohorts had shorter first and second birth intervals but longer third birth intervals than older cohorts.

7.5. MULTIVARIATE ANALYSES

As observed above, the application of the life table technique to various subgroups results in rapid depletion of sample sizes. The proportional hazards model, a model that combines product-limit life table and regression technique, is therefore an ideal solution. Holford (1980) and others have demonstrated that the proportional hazards model and log-linear (multiple contingency table) models are equivalent if all covariates are in categorical form and time can be counted in units in which the underlying hazard rate is a constant. The proportional hazards model was described in Chapter 3.

Log-linear models are therefore fitted to determine the simultaneous effects of several factors on the hazard rate, in this case the risk of having a birth, in a specified interval. The hazard rate is obtained for each group as follows:

Let B_j = number of women who have a birth in the duration $[d_j, d_{j+1})$, or month j;

N_j = number of women at the start of the interval j;

R_j = number censored, widowed or divorced in month j;

EX_j = adjusted number of women exposed to risk in month j

Therefore, for all intervals j,

$$EX_j = N_j - 0.5\ R_j - 0.5\ B_j$$

and the hazard rate (r) = (B_j / EX_j).* In other words, the hazard rate is computed as the number of births in the interval, divided by the average number of survivors at the mid-point of the interval. The

---

*It is assumed that if a woman is censored, widowed or divorced in a particular interval, the event takes place at the mid-point of the interval.

maximum duration considered here is 30 months and the minimum duration is 7 months. The models will be fitted for each birth interval in turn, from the first to the third birth interval.

For each birth interval, the hazard rates have to be calculated, coded and then input into the computer. As the whole process is tedious and time-consuming only some of the more important variables, such as age at first marriage and education, affecting birth timing are used. Also, at each try only three variables are used, for which the categories are similar to the classifications used in the last chapter, so as not to complicate the interpretation of the results and to reduce the models that have to be tested.* GLIM is again used and a Poisson error distribution is assumed.

7.5.1. DETERMINANTS OF THE TIMING OF THE FIRST, SECOND AND THIRD BIRTHS

The first set of models included age at first marriage (A), education (E) and migration status (M) as independent variables on the hazard rates (r). The results indicate that age at first marriage and education are significantly important at 0.05 level while migration status is not for both the Malay and Chinese samples. All the two-factor interactions are found to be not significant at 0.05 level. Of all the models tested, model (A,E,M) seems to be the best, in terms of the mean deviance and the number of parameters. Table 7.9 presents the raw estimates and the estimates of the independent variables obtained in the selected model. The criteria of selection

---

*Also, it has been shown by Goodman (1972) that the relationship between an independent and a dependent variable can be summarised adequately in small-dimension tables.

Table 7.9

Estimated Effects of Age at First Marriage (A), Education(E) and Migration Status (M) on the Timing of the First Birth With or Without Control for Other Factors, 1974 MFFS

Parameter	Raw Estimates	Calculated Ratios	Estimates in Model (A,E,M)	Calculated Ratios
Malays				
Age at First Marriage				
17-18	0.5909 (0.0508)	0.55	0.5224 (0.0516)	0.59
19-20	0.6923 (0.0606)	0.50	0.5977 (0.0618)	0.55
21-24	0.6948 (0.0582)	0.50	0.5646 (0.0612)	0.57
Education (in years)				
1-6	0.3668 (0.0435)	0.69	0.2646 (0.0444)	0.77
7+	0.8002 (0.0697)	0.45	0.4657 (0.0761)	0.63
Migration Status				
Urban non-migrants	0.0864 (0.0854)	0.92	0.0063 (0.0859)	0.99
Rural non-migrants	-0.2755 (0.0538)	1.32	-0.1249 (0.0551)	1.13
Chinese				
Age at First Marriage				
17-18	0.4230 (0.0893)	0.65	0.4039 (0.0894)	0.67
19-20	0.5307 (0.0893)	0.59	0.4997 (0.0898)	0.61
21-24	0.3752 (0.0815)	0.69	0.3572 (0.0835)	0.70
Education (in years)				
1-6	0.2758 (0.0527)	0.76	0.2585 (0.0541)	0.77
7+	-0.0039 (0.0775)	1.00	-0.0067 (0.0842)	1.01
Migration Status				
Urban non-migrants	0.0285 (0.0579)	0.97	0.0123 (0.0585)	0.99
Rural non-migrants	0.0888 (0.0570)	0.91	0.0859 (0.0578)	0.92

Note: Figures in brackets are standard errors
These ratios are calculated relative to the omitted category of each variable, that is (a) age at first marriage below 17 years, (b) women with no education, (c) migrants.
See Table 6.14 for an interpretation of figures.

are similar to those presented in Chapter 6. The estimates by age at first marriage categories indicate that the probability of having the first child increases with age at first marriage up to the age of 20 years and then declines, controlling for education and migration status. This pattern is also observed for the Chinese. The pattern by education indicates that Malay women educated for 7 years or more had a higher probability of having the first child, controlling for age at first marriage and migration status, than uneducated women or women educated for 1-6 years. Chinese women, on the other hand, had a lower probability of having the first child within 30 months of marriage if they had 7+ years of education compared with those with less than 7 years of education or no education; the probability is highest for those women with 1-6 years of education. In the case of Malay women, taking into account age at first marriage and education level, rural non-migrants had the lowest risk of having a first child compared with migrants or urban non-migrants. Chinese migrants, however, showed the lowest probability of having the first child within 30 months of marriage, controlling for education and age at first marriage.

Age at first marriage, migration status, and education are all significant at 5 percent level in determining the timing of the second birth of Malay women while for Chinese women, only education and age at first marriage are significant. All two-factor interactions are not significant.

For the Malays (rf. Appendix 7.2), estimates from the model (A,E,M) indicate that the older the age at first marriage, ignoring those who married before the age of 17 years, the lower the risk of

having a second child within 30 months of the first child, controlling for migration status and education level. The probability of having the second child within 30 months of the first child was highest for migrants, followed by urban non-migrants and lastly rural non-migrants, if age at first marriage and education are controlled. In the case of education, with control for the other two variables, the model indicates that the higher the level of education, the higher the risk of having the second child.

In the case of Chinese women, except for those who married above the age of 20 years, the older the age at first marriage, the higher the risk of having the second child within 30 months after the first child, controlling for education level and migration status. Women who married when they were above 21 years old had a slightly higher risk of having the second child within 30 months than women married before the age of 17 years. Education above 6 years seems to reduce the risk of having the second child in the interval of 30 months after the first child, after controlling for age at first marriage and migration status. Women with 1-6 years of education had a slightly higher risk of having the second child than women with no education. If age at first marriage and education are controlled, the probability of having the second child is lowest for urban non-migrants, followed by migrants while it is highest for rural non-migrants.

The set of models involving age at first marriage, education and migration status as independent variables on the timing of the third child of the Malay women indicate that all these factors are not significant at the 0.05 level. Nevertheless, as the interest is in the effects of these variables on the probability of having a birth,

the estimates of these variables are discussed. The results (rf. Appendix 7.3) obtained using model (A,E,M) indicate that women who married at 19-20 years tended to have a lower probability of having the third child within 30 months of the second child than women who married younger or older than this age range. Some education compared with no education increases the probability of having the third child in the interval but more highly educated women (more than 6 years) indicate a lower probability than those educated for 1-6 years. Migrants were most likely to have the third child in the specified interval, with urban non-migrants second and rural non-migrants least likely.

While age at first marriage and migration status are not significant in determining the probability of having a third birth, for the Chinese women, education is significant. Model (A,E,M) indicates that the higher the age at first marriage up to the age of 20 years, the higher the probability of having a third birth within 30 months of the second birth. Chinese women who married after the age of 20 years had the lowest risk of having the third birth compared with women who married at younger ages. Educated women with more than 6 years of education had about 90 percent less risk of having a child than women with no education or 1-6 years of education. Chinese urban non-migrants seem to have about 14 percent less risk than migrants or rural non-migrants.

Thus, to summarise the results, while education level and age at first marriage are significant determinants of the timing of the first and second births of the Malay and Chinese women within the 30 months period, migration status is only significant in affecting the timing

of the second child. In the case of the Chinese women, education is a significant determinant of the timing of the third child.

While an increase in age at first marriage initially increases the probability of having a first birth in the 30 months period for the Malay women, an increase over the age of 20 years reduces the risk, controlling for migration status and education. An older age at first marriage also reduces the risk of a Malay woman having a second child in the 30 months period after the first child if the other two variables are controlled. But Malay women who married after the age of 20 years showed a higher probability of having a third child within the 30 months period than those married at 19-20 years, if education and migration status are taken into account. Hence, an older age at first marriage may slow down the timing of the first and second child of the Malay women but once they have had two children, they tend to have the third child faster than women who married at younger ages.

As regards the effect of education on the timing of births, taking into account age at first marriage and migration status, the results indicate that a Malay woman who had more than 6 years of education had a higher probability of having the first and second child within the 30 months period. Although the timing of the third child of a Malay woman with some education is still faster than that of a woman with no education, the probability is lower in the 30 months period for a woman with 7+ years of education than for one with 1-6 years of education controlling for the other two variables. Therefore, education quickens the process of childbearing of the Malay women and more than 6 years of education increases the pace of having the first and second births but not the third one. Perhaps Malay

women who are more highly educated tend to have higher status and a lower divorce rate, which may partly explain the shorter first and second birth intervals. Other explanations may include a desire to finish with childbearing quickly and to concentrate on a career, as more educated women have better-paid jobs.

The results by migration status, controlling for age at first marriage and education, also indicate that Malay rural non-migrants had the lowest risk of having the first, second and third births compared with urban non-migrants or migrants. Malay migrants, however, had the highest risk of having the second and third births if age at first marriage and education are controlled. The pace of childbearing of Malay women appears to be quickened by migration. Perhaps migrant women do not have as low a status as rural non-migrants and are less likely to divorce, which may explain the closer spacing of children.

The Chinese women unlike the Malay women had a higher risk of having the first, second and third births the older they married up to age 20 years, controlling for education and migration status. However, compared with women who married at younger ages, those who married above the age of 20 years, taking into account education and migration status, had a higher probability of having the second birth but a lower probability of having the first and third births. Thus, Chinese women who married at an older age, that is above the age of 20 years, tended to have the first child later than women who married at younger ages. These women, however, tended to have their second child fairly quickly but once they have had two children, there was less probability of having the third child than women married at younger

ages.

Controlling for age at first marriage and migration status, the effect of education on the timing of the first three children of the Chinese women is similar to that of the Malay women in that some education quickens the process of childbearing compared with no education. Unlike the Malay women, Chinese women with more than 6 years of education, controlling for the other two variables, were less likely than women with 1-6 years of education or no education to have each of the first three children in a 30 months period.

Also, unlike the Malays, Chinese urban non-migrants had a lower probability of having the second and third births compared with migrants or rural non-migrants, controlling for education and age at first marriage. The probability of having a first birth was however lower for Chinese migrants than non-migrants, with age at first marriage and education controlled. Thus, migration tended to slow down the pace of having the first child but not the subsequent two children.

7.5.2. DIFFERENCES ACROSS BIRTH COHORTS

Three birth cohorts are used, that is women born in 1950-59, 1935-49, 1925-34.* The estimates obtained using the model

---

*The three birth cohorts are divided roughly into three groups in relation to the availability of contraception, as explained earlier. Modern contraception would have been available to the 1950-59 cohort at the start of childbearing while the 1935-49 cohort would have been at various stages of childbearing and the last group would have been nearing the end of the childbearing. The National Family Planning Programme was introduced in 1967 and modern contraception became widely available in the rural areas soon afterwards. In the urban areas, contraception was available from drug stores and private family planning associations even before this date.

Table 7.10

Estimated Effects of Age at First Marriage (A), Education (E), and Birth Cohort (C), on the Timing of the First, Second and Third Birth in Model (A,E,C), Malay and Chinese Women Aged below 45 Years of Age, 1974 MFFS

Parameter	Malays	Calculated Ratios*	Chinese	Calculated Ratios*
First Birth				
Age at First Marriage				
17-18	0.4414 (0.0536)	0.64	0.3781 (0.0953)	0.68
19-20	0.5046 (0.0643)	0.60	0.4184 (0.0957)	0.66
21-24	0.5112 (0.0646)	0.60	0.2939 (0.0901)	0.75
Education (in years)				
1-6	0.0376 (0.0484)	0.96	0.1895 (0.0576)	0.83
7+	0.2352 (0.0796)	0.79	-0.1081 (0.0875)	1.11
Birth Cohorts				
1935-49	-0.1817 (0.0564)	1.20	-0.1899 (0.0918)	1.21
1925-34	-0.5787 (0.0717)	1.78	-0.4001 (0.0988)	1.49
Second Birth				
Age at First Marriage				
17-18	0.3357 (0.0652)	0.72	0.1495 (0.0975)	0.86
19-20	0.2769 (0.0820)	0.76	0.2249 (0.0980)	0.80
21-24	0.1491 (0.0820)	0.86	-0.0117 (0.0942)	1.01
Education (in years)				
1-6	0.3199 (0.0605)	0.73	0.0066 (0.0621)	0.99
7+	0.3907 (0.1089)	0.68	-0.4895 (0.1071)	1.63
Birth Cohorts				
1935-49	-0.0061 (0.0787)	1.01	-0.0441 (0.1146)	1.05
1925-34	-0.1133 (0.0936)	1.12	-0.2739 (0.1207)	1.32
Third Birth				
Age at First Marriage				
17-18	0.3127 (0.0773)	0.73	0.1708 (0.1070)	0.84
19-20	0.0968 (0.1071)	0.91	0.0686 (0.1116)	0.93
21-24	0.1091 (0.1053)	0.90	-0.0456 (0.1062)	1.05
Education				
1-6	0.3335 (0.0702)	0.72	0.0089 (0.0709)	0.99
7+	0.2531 (0.1560)	0.78	-0.7595 (0.1520)	2.14
Birth Cohorts				
1935-49	0.1932 (0.1240)	0.82	-0.0847 (0.1734)	1.09
1925-34	0.1858 (0.1349)	0.83	-0.1099 (0.1766)	1.12

Note: Figures in brackets are standard errors

* The omitted categories are (a) age at first marriage below 17 years, (b) no education, (c) 1950-59 birth cohort.

(A,E,C),** where C = birth cohort, indicate generally the same results for age at first marriage and education categories as in earlier models (rf. Table 7.10). These results therefore will not be described. The results by birth cohorts, when controlled for age at first marriage and education, indicate that the older the birth cohort, the lower the probability of having the first child in the specified interval. The lower probability could have resulted from birth omissions or birth displacement to more recent periods particularly by the older cohort of 1925-34 (rf. Masitah, 1982). Further, women in older cohorts tend not to have consummated their marriage immediately compared with younger cohorts (rf. Chap. 2). Another reason which applies to the Malays is that divorces have become less common and so younger women would have a shorter first birth interval than older women, particularly as divorces usually take place soon after marriage (rf. Chap. 2). An additional reason is that a higher proportion of younger Chinese women compared with older women had premarital first births or conceptions (rf. Sect. 7.2). A lower proportion of younger Malay women had premarital first births or conceptions compared with older cohorts (rf. Sect. 7.2). For both the Malay and Chinese women, another plausible explanation is that younger women tend to be more educated and to participate in the work force and may wish to have a child quickly and then terminate their childbearing early, as contraception is available to do this.

In the second birth interval, older cohorts again have a lower probability than younger cohorts of having the second birth within 30 months of the previous birth, when controlled for age at first

---

** The age at first marriage and education interaction is significant at 0.05 level for the Chinese sample for the first and third birth interval but all other interaction effects are not significant. For the Malay sample, all interaction effects are not significant.

marriage and education. This same pattern is observed in the third birth interval for Chinese women, but Malay women in older cohorts are more likely than those in younger cohorts to have the third child in the specified interval. Birth displacements may be responsible for the difference in the result for the Malay women.

7.5.3. EFFECTS OF AGE, DURATION AND PERIOD

The results presented earlier for birth cohorts, or age at survey, did not take into account age, period or duration effects at the time of the birth of the child. In this section, a model using the latter three effects will be attempted, although such models are problematic because of estimation problems. The dependent variable used is fertility rates: number of births divided by woman-years of exposure. The findings obtained in such a model would indicate the influence of these effects on the tempo of childbearing and reflect only indirectly on the quantum aspects.

A cross-tabulation of fertility rates by birth cohort, period and marital duration, the last two measured using years prior to the survey, contains age at birth of child, age at first marriage and marriage duration at birth of child as latent dimensions. Age at birth of child and age at first marriage can be obtained by taking the difference between birth cohorts and period, and birth cohorts and marriage duration, respectively. Marriage duration at birth of the child can be obtained by taking the difference between marriage duration and period. The latter three are not used directly in the cross-tabulation because it is inconvenient to do so and are therefore

measured with less precision than the first three.

Using the Standard Recode Tape, counts of the number of births and the woman-years of exposure by birth cohort by period and marriage duration were obtained. The FERTRATE (Fertility Rate)* program was used as the period by cohort results can be obtained directly. Six five-year birth cohorts are used, excluding the 45-49 age group, because Masitah (1982) found evidence of slight omission of births by this cohort. Births that occurred more than 25 years before the survey and in 1974, the year of the survey, were also excluded to reduce bias from omission of births and selection.** Therefore, five five-year categories of period and duration are used.

The parameters are estimated using the log-linear model

$$\ln (B_{APD}) = \ln (W_{APD}) + GM + AGE + PER + DUR$$

with an assumed poisson distribution, where B is the number of births, W is woman-years of exposure, GM is the grand mean and AGE, PER, and DUR are the effects of age, period and duration centred on A, P, D, respectively. The values are contrasted with the effects of the age-group centred on 15 years, the period 0-4 years prior to the survey and the duration-group centred on 5 years, each of which is set to zero.

The set of models involving AGE, PER and DUR are fitted using GLIM. In both the Malay and Chinese samples, all two-factor interactions are found to be significant at 0.05 level but AGE is found to be not significant in the Malay sample. The model

---

*A computer package of World Fertility Survey, London.

**This has been explained earlier in the chapter.

Table 7.11

Estimated Effects of Age (A), Period (P) and Duration (D) from the (A,P,D) Model on Fertility Rates, 1974 MFFS

Parameter	Raw Estimates	Calculated Ratios	Estimates in Model (A,P,D)	Calculated Ratios
Malays				
Age Group Centred on				
20	0.0489 (0.1115)	0.95	0.0967 (0.1151)	0.91
25	-0.0511 (0.1080)	1.05	0.0636 (0.1176)	0.94
30	-0.1230 (0.1073)	1.13	0.0336 (0.1209)	1.03
35	-0.1969 (0.1069)	1.22	0.0019 (0.1229)	1.00
40	-0.2628 (0.1104)	1.30	-0.0583 (0.1274)	1.06
Period (years before the survey)				
5-9	0.1382 (0.0265)	0.87	0.2503 (0.0283)	0.78
10-14	0.2369 (0.0286)	0.79	0.4351 (0.0322)	0.65
15-19	0.2084 (0.0349)	0.81	0.4754 (0.0396)	0.94
20-24	0.1668 (0.0592)	0.85	0.4825 (0.0638)	0.62
Duration Centred on Year				
5	-0.0806 (0.0544)	1.08	-0.1508 (0.0595)	1.16
10	-0.1976 (0.0522)	1.22	-0.3592 (0.0660)	1.43
15	-0.2433 (0.0507)	1.28	-0.4640 (0.0701)	1.59
20	-0.3322 (0.0503)	1.39	-0.5757 (0.0745)	1.78
Chinese				
Age Group Centred On				
20	-0.0888 (0.2366)	1.09	-0.0925 (0.2374)	1.10
25	-0.2369 (0.2317)	1.27	-0.2535 (0.2355)	1.29
30	-0.3879 (0.2307)	1.47	-0.4092 (0.2378)	1.51
35	-0.5013 (0.2305)	1.65	-0.5328 (0.2395)	1.70
40	-0.6678 (0.2309)	1.95	-0.7276 (0.2416)	2.07
Period (years before the survey)				
5-9	0.2324 (0.0328)	0.79	0.4780 (0.0360)	0.62
10-14	0.4269 (0.0358)	0.65	0.8922 (0.0431)	0.41
15-19	0.4703 (0.0446)	0.63	1.0900 (0.0543)	0.34
20-24	0.4268 (0.0833)	0.65	1.1400 (0.0920)	0.32
Duration Centred on Year				
5	-0.0746 (0.0576)	1.08	-0.0925 (0.0643)	1.10
10	-0.2652 (0.0569)	1.30	-0.3992 (0.0745)	1.49
15	-0.3299 (0.0567)	1.39	-0.5827 (0.0802)	1.79
20	-0.4261 (0.0573)	1.53	-0.6998 (0.0873)	2.01

Note: Figures in brackets are standard errors

(AGE,PER,DUR) is selected using the criteria described in Chapter 6.* The estimated effects of the independent variables of this model and the raw estimates are presented in Table 7.11.

Estimates from the selected model indicate that for the Malay women, the age effects rise from the youngest group to the group centred on age 20 years and then decline. For the Chinese women, the age effects decline from the youngest group. The effect of age here actually implies the effect of age at first marriage as the effect of age at birth is controlled for marriage duration. The impact of increasing age at marriage on fertility rates is thus stronger for the Chinese than the Malays (rf. last column, Table 7.11). This sharp fall for Chinese women may partly indicate the effect of fertility control. The duration effects also decline for both the Malay and Chinese women and the fall is sharpest for those married for 10 years or more. Once again, one would postulate that part of the effect of this sharp fall may be attributed to the practice of contraception.**

The pattern of period effects shows fertility declining since 24 years before the survey to the recent periods before the survey. The drop is sharp for both Chinese and Malay women in the period 10-15 years before the survey and became particularly sharp about 5 years before the survey. The sharp decline in the recent years before the survey coincides with the introduction of the National Family Planning Programme. The fall in fertility since the 1950s agrees with earlier evidence obtained from censuses and vital statistics.

---

*The model with two-factor interactions is not selected because of very large standard errors for some of the categories. The estimated effects for such a model remain generally the same across categories as those obtained from a model without interaction terms.

**This hypothesis cannot be tested because data on contraceptive use are only available for the two most recent births before the survey.

7.6. SUMMARY AND DISCUSSION OF RESULTS

Mean age at first birth, like mean age at first marriage, is increasing over time. The former is however largely a result of the latter as premarital first births or conceptions remain negligible in number. The application of the Coale-McNeil Nuptiality Model to first birth data indicates that while Malay women, on average, married earlier than Chinese women, the average age at first birth of the Chinese women was similar to the Malay women or only slightly later. There is a difference of one and a half months in the mean intervals of the two races.

A study of the first, second and third birth intervals separately using the life table technique indicates that the probability of having a child in a three-year interval was always higher for Chinese women. Premarital first births or conceptions were also higher for the Chinese than the Malays.

Generally, within each race, for the three birth intervals analysed using the life table technique, the older the age at first marriage, the lower the risk of having a child in the three-year period, although during the first year after marriage the probability of having a child seems to be slightly higher for women who married at older ages. The use of age at first birth (two categories, less than or equal to 20 years, 21+ years) indicates that in the second and third birth intervals, both Malay and Chinese women who had a first birth below the age of 21 years are more likely to have the next child within two or three years of the birth of the first child than are women who had the first birth above the age of 20 years. The results

of multivariate analyses, using proportional hazards models fitted using GLIM, taking into account the effect of education and migration status, also support the evidence that an older age at marriage up to the age of 20 years increases the probability of having the first three children. Beyond the age of 20, an older age at marriage delays the timing of the first and second births but quickens the pace of the third birth of the Malay women. For the Chinese women, a postponement of age at marriage above 20 years quickens the timing of the second child but delays the timing of the first and third child. Thus, an initial postponement of age at marriage from very young ages results in a 'catch-up' effect but above an age at marriage of 20 years, the first birth interval was generally longer than those who married at younger ages.

Educated Malay women had shorter first, second and third birth intervals than uneducated women. Educated Chinese women had shorter first birth intervals but longer second and third birth intervals than uneducated women. Results from proportional hazards models, with control for age at first marriage and migration status, give similar results.

The results obtained by migration status categories are also mixed. Generally, however, Chinese non-migrants tended to have a higher probability of having a child in all three birth intervals while this probability was lower for Malay non-migrants than migrants.

A higher proportion of Chinese women in younger marriage and birth cohorts had premarital births or conceptions than older cohorts. The reverse trend is observed among Malay women by birth cohorts but by marriage cohorts, the proportion of women having a premarital first

birth or conception is roughly constant. Generally younger cohorts had shorter first and second birth intervals but a longer third birth interval than older cohorts.* The same trend is observed in a multivariate analysis using proportional hazards models, controlling for education and age at first marriage.

The picture by period of birth indicates that women who had births in the recent periods had longer birth intervals than women who had births in the distant past. A log-linear model involving age, period and marriage duration as independent variables indicates that fertility rates are declining over time.

Thus, while there is every indication that fertility is declining over time, there is no definite pattern as regards childspacing. Chinese women, who married later than Malay women, spaced their children closer together than Malay women. Within each race, the spacing of children by age at marriage is not all similar. However, both Malay and Chinese women who married above 20 years of age tended to have a lower probability of having the first child than women who married at younger ages. The effect of education seems, on the one hand, to reduce the length of the birth intervals of the Malays but to lengthen the birth intervals of the Chinese. One possible explanation is that there are more Chinese women than Malay women with more than 6 years of education and it is not whether a woman is educated or uneducated but how much education she has received that affects the length of the birth interval. It is perhaps not just the effects of rising age at first marriage, and lower divorce rates for the Malay

---

*This is also observed by DaVanzo and Haaga (1982) using data from MFLS.

women, together with increasing level of education, and hence work force participation, but the recent availability of contraception that has resulted in the indefinite pattern by birth or marriage cohorts. A shift from no education to some education may shorten the birth interval but a higher overall or general level of education may lengthen it. Likewise, a shift from very young age at first marriage to a higher age at first marriage may result in a shorter first birth interval, as there is less adolescent sterility, and a higher proportion of women consummating marriage immediately, but the shift past a certain age may result in longer birth intervals because the woman is highly educated and holds a good job and may not want to have a child immediately. The whole process is further complicated by the fact that servants or relatives or both have been readily available to take care of the children while a woman goes to work, although in recent periods, such help has become increasingly difficult to find. Thus, a woman in a younger cohort may decide to have her children quickly and then return to work. This may explain the higher probability of a birth within three years for younger cohorts compared with older cohorts. However, looking at the trends in fertility and the observations of birth timing across periods, it is also possible that omissions of births and births displacement have exaggerated the difference across cohorts (rf. Masitah, 1982).[5]

Appendix 7.1

Cumulative Proportion of Women (whose first marriage had dissolved) Having a First Birth by Selected Interval Lengths in Months Since First Marriage by Selected Characteristics Using Life Table Technique, 1974 MFFS

Characteristics	12	18	24	30	36	Median Interval
Race						
Malays **	0.1575	0.3516	0.4661	0.5448	0.6012	26.6
Chinese	0.2483	0.5235	0.6779	0.7450	0.8054	17.5
Malays						
Age at First Marriage						
lt 17	0.1113	0.2699	0.3820	0.4584	0.5087	34.1
17,18	0.2468	0.4820	0.5779	0.6810	0.7331	19.1
19+	0.2407	0.5247	0.6655	0.7301	0.7770	17.5
Education						
None	0.1398	0.3277	0.4374	0.5163	0.5591	28.8
1+	0.1858	0.3900	0.5126	0.5908	0.6695	23.4
Work Status						
Ever-worked	0.1632	0.3569	0.4692	0.5464	0.5979	26.4
Never-worked	0.1373	0.3339	0.4523	0.5366	0.6113	27.4
Migration Status						
Non-migrants						
Town	*	*	*	*	*	*
Rural	0.1492	0.3278	0.4474	0.5242	0.5777	28.1
Migrants	0.2033	0.4797	0.5780	0.6773	0.7435	19.2
Birth Cohorts						
1950-54	*	*	*	*	*	*
1945-49	*	*	*	*	*	*
1940-44	0.1782	0.2985	0.4917	0.5323	0.6035	25.2
1935-39	0.2038	0.3949	0.4650	0.5159	0.5605	28.1
1930-34	0.1014	0.3243	0.4257	0.5203	0.5946	28.7

lt less than

* Sample size less than 100 cases

** Figures for Chinese women by other characteristics are not shown because of small sample size

Appendix 7.2

Estimated Effects of Age at First Marriage (A), Education(E) and Migration Status (M) on the Timing of the Second Birth With or Without Control for Other Factors, 1974 MFFS

Parameter	Raw Estimates	Calculated Ratios	Estimates in Model (A,E,M)	Calculated Ratios
Malays				
Age at First Marriage				
17-18	0.3637 (0.0615)	0.69	0.2919 (0.0622)	0.75
19-20	0.3259 (0.0771)	0.72	0.2401 (0.0783)	0.79
21-24	0.2589 (0.0763)	0.77	0.1419 (0.0800)	0.87
Education (in years)				
1-6	0.4105 (0.0531)	0.66	0.3564 (0.0540)	0.70
7+	0.5264 (0.0953)	0.59	0.3821 (0.1032)	0.68
Migration Status				
Urban non-migrants	-0.1176 (0.1071)	1.12	-0.1643 (0.1082)	1.18
Rural non-migrants	-0.3233 (0.0646)	1.38	-0.2384 (0.0657)	1.27
Chinese				
Age at First Marriage				
17-18	0.1465 (0.0909)	0.86	0.1380 (0.0911)	0.87
19-20	0.2152 (0.0907)	0.81	0.2280 (0.0914)	0.80
21-24	-0.0386 (0.0839)	1.04	0.0367 (0.0862)	0.96
Education (in years)				
1-6	0.0782 (0.0561)	0.93	0.0965 (0.0574)	0.91
7+	-0.4357 (0.0965)	1.55	-0.3524 (0.1029)	1.42
Migration Status				
Urban non-migrants	-0.1502 (0.0647)	1.16	-0.1212 (0.0655)	1.13
Rural non-migrants	0.0698 (0.0614)	0.93	0.0263 (0.0621)	0.97

Note: Figures in brackets are standard errors
These ratios are calculated relative to the omitted category of each variable, that is (a) age at first marriage below 17 years, (b) women with no education, (c) migrants.

Appendix 7.3

Estimated Effects of Age at First Marriage (A), Education(E) and Migration Status (M) on the Timing of the Third Birth With or Without Control for Other Factors, 1974 MFFS

Parameter	Raw Estimates	Calculated Ratios	Estimates in Model (A,E,M)	Calculated Ratios
Malays				
Age at First Marriage				
17-18	0.1633 (0.0697)	0.85	0.1303 (0.0709)	0.88
19-20	-0.0287 (0.1012)	1.03	-0.0625 (0.1021)	1.06
21-24	0.0806 (0.0954)	0.92	0.0418 (0.0980)	0.96
Education (in years)				
1-6	0.1775 (0.0591)	0.84	0.1454 (0.0604)	0.86
7+	0.1381 (0.1413)	0.87	0.0562 (0.1494)	0.95
Migration Status				
Urban non-migrants	-0.0509 (0.1307)	1.05	-0.0464 (0.1323)	1.05
Rural non-migrants	-0.2139 (0.0786)	1.24	-0.1942 (0.0794)	1.21
Chinese				
Age at First Marriage				
17-18	0.1384 (0.0997)	0.87	0.1324 (0.1000)	0.88
19-20	0.1551 (0.1005)	0.86	0.1661 (0.1013)	0.85
21-24	-0.1219 (0.0948)	1.13	-0.0283 (0.0972)	1.03
Education (in years)				
1-6	0.0552 (0.0630)	0.95	0.0792 (0.0645)	0.92
7+	-0.7713 (0.1374)	2.16	-0.6529 (0.1445)	1.92
Migration Status				
Urban non-migrants	-0.2015 (0.0760)	1.22	-0.1349 (0.0769)	1.14
Rural non-migrants	0.0554 (0.0702)	0.95	0.0093 (0.0706)	0.99

Note: Figures in brackets are standard errors
These ratios are calculated relative to the omitted category of each variable, that is (a) age at first marriage below 17 years, (b) women with no education, (c) migrants.

ADDITIONAL NOTES (CHAPTER 7)

Page numbers in brackets at the end of each note refer to the relevant page in the text of the thesis.

[1] For a more elaborate and detailed analysis of the factors affecting age at first birth see, for example, Hirschman and Rindfuss, 1980, and Rindfuss and Morgan, 1983.

[2] Examiners report No. 3 says simply that in Chapter 7, I have 'not dealt correctly with selectivity in the data.' He does not refer to the specific aspect of selectivity to which he is alluding. He makes reference, however, to a paper which deals with age selectivity so I presume that this is the type of selectivity to which he is referring. The analysis of birth intervals in Chapter 7 is carried out on all intervals started 3-20 years before the survey for women who were aged less than 45 at the time of the survey. As I noted on p. 273 of the thesis:

> 'Inclusion of all available intervals in the analyses will result in under-representation of older cohorts (as a certain proportion of the women would have died), over-representation of younger ages at the beginning of intervals (as younger birth cohorts would not have a chance to initiate intervals at older ages), and intervals initiated in recent periods would not have had the chance of closing. A discussion of selectivity bias can be found in Rindfuss et al., 1982.'

The last mentioned reference is the reference to which Examiner 3 has referred. In other words, I was well aware of the age selectivity bias but considered that the age selectivity bias was likely to be smaller in comparison to other selectivity biases that are introduced if age selectivity is controlled. To control for age selectivity in my analysis I would have had to eliminate all intervals occurring at age 25 years and over. For some groups in my analysis, this would have produced severe distortions - for example women having their third birth under age 25 years when they had married at age 21 years or over will obviously have had very short birth intervals. Thus no matter which choice was made, to use all intervals or only those under age 25 years, selectivity bias is inevitable as I have acknowledged in the thesis. My judgement was that age selectivity was likely to be much less severe than the type of selectivity I have alluded to in the above example. To confirm this judgement, I have further investigated the age selectivity bias.

It can be shown algebraically that the age selectivity bias is important in an analysis of all intervals only if

(i) birth intervals vary greatly according to the age at which they commence, and

(ii) older age intervals are a relatively large proportion of the total intervals.

Using as an example, the first to second birth interval, let

$$m = \frac{\text{number of women having a second birth in a given period/ interval length}}{\text{number of women 'exposed to the risk' of having the second birth}}$$

i.e. $$m = \frac{W}{T} = \frac{W(<25) + W(25+)}{T(<25) + T(25+)}$$

where $W(<25)$ refers to women less than 25 years of age.

$$m(<25) = \frac{W(<25)}{T(<25)}$$

$$m(25+) = \frac{W(25+)}{T(25+)}$$

Hence,

$$m = \frac{m(<25)\ T(<25) + m(25+)\ T(25+)}{T}$$

Let $T(25+) = p.T$

and $m(25+) = r.m(<25)$

then $$m = \frac{m(<25).\ T(<25) + r.m(<25).p.T}{T}$$

i.e. $m = m(<25)\ (1 - p + rp)$

where p = proportion of women 'exposed to the risk' of having a second birth who are aged 25+ years

and $$r = \frac{m(25+)}{m(<25)}$$

From the 1974 MFFS, the 'p', 'r', and 'm/m(< 25)' values for the various intervals, for selected interval lengths after the previous event, are as follows:

(i) Marriage to First Birth Interval

Number of Months After Marriage	Malays p	Malays r	Malays m/m(< 25)	Chinese p	Chinese r	Chinese m/m(< 25)
12	0.04	0.89	0.996	0.17	0.12	0.969
24	0.04	0.97	0.999	0.19	0.72	0.947
36	0.05	0.97	0.999	0.28	0.72	0.922

(ii) First to Second Birth Interval

Number of Months After First Birth	Malays p	Malays r	Malays m/m(< 25)	Chinese p	Chinese r	Chinese m/m(< 25)
12	0.05	0.66	0.983	0.20	0.77	0.954
24	0.06	0.93	0.996	0.24	0.76	0.942
36	0.06	0.94	0.996	0.33	0.86	0.954

(iii) Second to Third Birth Interval

Number of Months After Second Birth	Malays p	Malays r	Malays m/m(< 25)	Chinese p	Chinese r	Chinese m/m(< 25)
12	0.14	0.95	0.993	0.36	1.25	1.090
24	0.14	0.84	0.978	0.39	0.76	0.906
36	0.17	0.68	0.946	0.48	0.77	0.900

Thus age selectivity bias is relatively unimportant for both the Malays and Chinese, bearing in mind that the values are in terms of proportions, and the gains for not imposing this additional restriction, as described above, have not been taken into account. (p. 273)

Note: The presence of age selectivity bias in the results is acknowledged on p. 282 and p. 285 and elsewhere. It was explained on p. 105 that the presence of a certain amount of selection and truncation bias is unavoidable in the present analysis since the reduction of one bias results in an increase in the other bias.

[3]The additional control by parity also indicates a fall in mean total birth interval across both birth and marriage cohorts, where figures are available (rf. Table below).

Mean Total Birth Interval in Months of Ever-married Women Aged below 45 years by Race by Birth and Marriage Cohorts by Parity, 1974 MFFS

	Malays		Chinese	
	Parity 1	Parity 2	Parity 1	Parity 2
Birth Cohorts				
1950-54	18.2	18.9	12.5	14.2
1945-49	21.2	22.4	16.0	16.3
1940-44	25.4	23.9	21.6	17.4
1935-39	31.8	25.3	*	18.7
1930-34	*	25.6	*	20.5
Marriage Cohorts				
1965-69	27.1	20.0	26.7	17.4
1960-64	*	23.1	*	17.9
1955-59	*	24.6	*	17.8
1950-54	*	25.4	*	19.8

* less than 30 cases

(p. 274)

Note : These results may be affected by age selectivity as discussed in footnote 2 above.

[4]The reduction in the birth interval of later cohorts may also suggest the importance of changing lactation practices. The fact that the proportion of women not breastfeeding decreases with increasing parity (rf. p. 136) suggests that some of the increased tempo at lower parities may be deliberate. (p. 275)

[5]It was stated on pp. 272-273, based on Masitah (1982), that slight omission of births, particularly female births, was found for the 45-49 age group and, for the cohort aged 40-44, there was evidence of displacement of births from the period 25-29 to the period 20-24 years before the survey. Otherwise, the data are of reasonable quality. The exaggeration of the difference across cohorts is therefore not expected to be great. (p. 311)

CHAPTER 8

SUMMARY AND CONCLUSION

PERIOD AND COHORT RELATIONSHIPS OF NUPTIALITY AND FERTILITY

8.1. MAIN FINDINGS

The period 1957-80 witnessed great social, economic and demographic changes in Malaysia. Over this period, there was improvement in income levels, lower adult and infant mortality, higher levels of education and literacy, higher levels of urbanisation, and greater participartion in work outside agriculture, such as in manufacturing and services. There was also evidence of decline in period fertility, which can be attributed to both increasing age at first marriage and lower marital fertility, as an increasing proportion of women had knowledge of and were using methods of contraception. The practice of breastfeeding shows signs of declining but there is also no evidence to indicate that children are valued less. With increasing urbanisation and changes in job opportunities, and a loosening of family ties, the perception of children as economic investments and as providing emotional support is likely to diminish over time.*

---

*Although not directly comparable, evidence from the 1966-67 MFS and the 1974 MFFS indicates that the average number of additional children wanted by women aged 30-39 years, who had 1 or 2 children, declined from about 2.7 children to 1 child over the two surveys. For such women with 3-4 children, the number of additional children wanted declined from about 1.5 children to 1 child.

The evidence presented in this thesis indicates that Malaysia's experience does not fall exactly into any one phase or 'strategy' of Ryder (1967) or Matras (1964) (see Section 1.3.1). The Chinese being more 'modern' are probably now at stages (b) and (c) of the strategies of Matras and Ryder. That is, the Chinese are marrying late but fertility is not fully controlled and there is no indication that marriage is becoming less universal. The Malays are not marrying as late as the Chinese and there is less practice of contraception. Their nuptiality-fertility pattern also probably falls into stages (b) and (c) of the strategies of Matras and Ryder. With increasing eduation, urbanisation and greater participation in non-agricultural roles, the Malays may catch up with the Chinese in terms of lower fertility and late age at marriage, although this may not be for some time yet. For both the Malays and Chinese, the proportion not marrying may increase in the future.*

There are a number of other key findings. For the Malays, there are indications of decline in the age-specific risks of marital disruption due to divorce and widowhood.[1] The divorce rates for the Malays were very much higher than for the Chinese and the Indians, who had relatively insignificant divorce rates. As a result of the higher number of marriages dissolved as well as a faster rate of remarriage, there was a higher proportion of Malay women remarrying. Malay women who divorced at younger ages tended to remarry quickly while those widowed at younger ages tended to take a longer time to remarry.

---

*Over the 1957-1980 period, the proportion of women remaining single in the age group 35-39 years for the Malay and Chinese women increased from 1 to 4 percent and 3 to 8 percent, respectively.

Polygyny is declining as a result of a higher level of education, increasing urbanisation and increasing awareness among women of their rights. There also appears to be a change from arranged marriages to marriage partners chosen by the individuals with parental approval or marriages arranged by the parents with the approval of the couple concerned. Traditional forms of marriage arrangements are still followed and are combined with more modern forms of marriage arrangements. After marriage, couples tend to live with either set of parents although there is evidence that, given the choice, most couples prefer to live on their own.

The number of interethnic marriages remained small as a proportion of all marriages and the most common type of intermarriages were between Malays and one of the other two main races, the Indians and the Chinese. Women who inter-married tended to be those whose husbands were older than the wives by 10 years or more and those with at least 6 years of education. There was no evidence to indicate that women who inter-married tended to be those who had been married before.

Education was found to be the most significant factor in explaining the variation in age at first marriage, followed by work status before marriage and lastly childhood residence. The probability of divorce was higher the younger the age at marriage but this probability declined the longer the marital duration. Women in rural areas had a higher probability of divorce than women in urban areas or those who were migrants. The probability of divorce was also higher for women with some work experience compared with those with no work experience. Childless women had a higher probability of divorce

than women with children. For women with children, those with a son had a lower probability of divorce than those with no son. Thus, consistent with some studies carried out for more developed societies, childlessness seems to have some effect on the probability of divorce. The presence of young children, however, did not have much effect on a divorce taking place.

The results of this study, in common with the results obtained in other studies described in the literature review in Section 1.3, showed that age at first marriage and education had significant negative effects on the level of fertility. The effect of contraception was not so clear-cut but it was found that women who have ever practised contraception tend generally to have a smaller family size. Migration status and work status did not significantly affect fertility once age at first marriage and education were controlled.

In line with the evidence of fertility decline, evidence from vital statistics indicates that the proportion of women, both Malays and Chinese, having a fifth or higher order birth is declining over time. While the Chinese showed a higher proportion of women having high order births in 1964 than the Malays, by 1979, the situation had reversed. Parity progression ratios calculated using the 1974 MFFS data indicate that a Malay woman had a higher probability of having a fourth or fifth order birth compared with a Chinese woman.

In terms of birthspacing, not only were the Chinese spacing the first three births closer together, but they tended, on average, to have the first birth at about the same age as the Malays. The use of multivariate analyses, in this case proportional hazards models,

taking into account education and migration status, indicate that the older the age at first marriage up to 20 years, the higher the probability of having the first three children in the 30 months period. However, a postponement of marriage above the age of 20 years tended to reduce the probability of having the first child for both Malay and Chinese women. The effect of education, taking into account age at marriage and migration status, was different for the Malays and the Chinese; education reduced the lengths of the birth intervals of the Malays but increased the lengths of the birth intervals of the Chinese. The results by migration status were also mixed. Generally, Malay non-migrants had longer birth intervals while Chinese women migrants had shorter birth intervals, controlling for education and age at first marriage. Comparing women in younger birth cohorts with older cohorts, women in younger cohorts tended to have children closer together, controlling for education and age at first marriage.

PERIOD AND COHORT RELATIONSHIPS OF NUPTIALITY AND FERTILITY

While age at first marriage has been increasing over time, period fertility has been declining. The decline in period fertility was faster for the Chinese than for the Malays. The faster fertility decline of the Chinese women can be attributed both to the delay in the age at first marriage, which is far above that of the Malays, and the greater decline in marital fertility. The shift to childbearing at older ages, which is currently taking place, has caused period fertility to fall below the underlying cohort fertility. Thus the older age at first marriage and hence older age at childbearing of the Chinese compared with the Malays is giving a misleading impression of

the extent to which the Chinese are reducing their completed family size. Available evidence of women almost completing their childbearing as well as the forecast of completed fertility of younger women seems to indicate at most one child less for the Chinese compared with the Malays. If successive cohorts of women gradually concentrate more of their births into a shorter span of time, and this seems to be indicated, without further appreciable reduction of their completed family size (and this seems to be happening), the time period fertility will eventually rise above the underlying cohort fertility. When period fertility is above cohort fertility, it will give a misleading impression that family size is being increased. In the case of the Malays, there is already some indication of this in the late 1970s. The Chinese period fertility may only start rising in the 1980s, because they have delayed their marriages and births longer than the Malays.

The greater decline in period fertility for the Chinese may be explained by lower desired family size norms among the Chinese. The lower Chinese family size norms are the result of their being more urbanised (although the tempo of urbanisation has recently been higher for the Malays); being less likely to be working in agriculture; having lower infant mortality, and greater knowledge and use of contraception. Also, the Chinese from 1957 and up to recently, had higher period fertility than the Malays. The postponement of marriage to an older age may also be another reason. One may argue that the Chinese have always married later than the Malays, yet they have had higher completed family size. Without going into the reasons for the lower Malay period fertility until recently, to be given in the next paragraph, one may put forward the argument that it is the

postponement of marriage past a certain age that is causing the present sharp decline in Chinese period fertility. Evidence from this study indicates that age at marriage is negatively related to fertility levels if age at marriage is increased above 16 years (rf. Sect. 6.4).

The lower Malay period fertility compared with the Chinese in the past may be explained in terms of the greater instability of Malay marriages due to divorce and widowhood, and the higher proportion of women practising breastfeeding as well as the longer periods of breastfeeding. Malay women in the early periods may have also been practising some traditional forms of contraception or were not as fecund as the Chinese because of poorer nutrition. The lower decline in period fertility for the Malays, in addition to the reasons specified earlier for the greater decline in Chinese period fertility, may also be due to the decline in divorce rates.

As yet, it is difficult to predict by how much completed family size is being reduced in Malaysia. For the Chinese women, the most recent cohort of women to have completed their reproductive period, that is the birth cohort of 1936-40, had a completed fertility of about 5 children. The 1931-35 and the 1926-30 Chinese birth cohorts had a completed family size of 5.6 and 6.1 children respectively. The 1936-40 Malay birth cohort had a completed family size of about 6 children, similar to that of the 1931-35 and the 1926-30 birth cohorts. The 1936-40 birth cohort was in fact only 40-44 years of age in 1980 and fertility may well not be completed for this group. For younger women, 35-39 years, who would have almost completed fertility, the average number of children ever born was 5.8 for the Malays and

5.4 children for the Chinese in 1970. In 1980, the figures for this group of women were 5.1 and 4.1 respectively. For the Malay women, in the past 10 years or so, the age specific fertility rates of the 35-39 and the 40-44 age groups, have not changed very much. For the Chinese women, there is evidence of decline in the age specific fertility rates of these two age groups. Thus the completed fertility among cohorts nearing the end of the reproductive period seems to have been falling considerably more for the Chinese than for the Malays.

The estimates in Graphs 6.1 and 6.2 show that period and cohort fertility are coming closer together for both races. This suggests that the postponement of births to later ages may now have reached the point where it is balanced by the making-up of births at older ages. Under these circumstances, if cohort fertility does not continue to decline, period fertility may stabilise and even rise above cohort fertility if younger cohorts continue to space their births closer together.*

If this happens, the number of births may rise faster for the Chinese than for the Malays, for a number of reasons. The Chinese were postponing marriage to later ages than the Malays and therefore women from the baby boom of the 1950s will be married and at the peak of childbearing in the 1980s, while the same cohort of Malay women will have married and commenced childbearing earlier. Chinese women also tend to space their children closer together than the Malay women. The rate of increase of Malay period fertility may be retarded as more and more women attain higher levels of education, become more

---

*In fact, for the Malays, there were signs that period fertility had already begun to rise in the late 1970s (rf. Graph 6.1).

urbanised, gain increased knowledge and practice of contraception, and as levels of infant mortality drop. On the other hand, the decline in marital instability due to widowhood and divorce may increase Malay fertility. Chinese women who only realised they were in polygamous unions when the 1976 Marriage and Divorce Act was enforced in 1982 may divorce and remarry or they may remain in their original unions. Polygamous unions are not expected to form a sizable proportion of all Chinese unions and the enforcement of the Act is unlikely to affect the fertility level very much.

8.2. PROSPECT

The expectation that period fertility levels may rise as the large birth cohorts of the 1950s move into the childbearing ages, unless cohort fertility is substantially reduced, poses serious threats to the government's development strategy. Fertility is unlikely to be substantially reduced with further increase in the age at marriage, because the age at marriage, particularly for the Chinese, is already at a high level. Further decline in fertility will have to come from declines in marital fertility as a response to declines in family size norms.

Several changes in the marriage and household structure and functions already taking place may assist fertility decline. The shift from closed to more open mate selection, as alleged by some scholars, has the effect not just of raising the age at entry into sexual unions but also of decreasing the proportion who ever marry. The shift away from dowry and bride price to investing in the

education of each child to facilitate his or her placement in the occupational and class structure has increased the saliency of costs of rearing children. The increasing tendency of newly-married couples to move to their own home also discourages early and frequent childbearing. The increased freedom of women to pursue a career as an alternative to marriage and prolonged childbearing may reduce the proportion who ever marry, of if they do, they may complete childbearing at a younger age. Undoubtedly economic development with increasing education, urbanisation and increased costs of rearing children will continue to depress fertility levels, but norms about the actual family size that are influenced by cultural factors may not change very much.

Available evidence indicates that parents still perceive children as economic investments and as providing emotional support. The majority of parents in the 1974 MFFS mentioned financial help from children and many expect to live with their children in their old age. With no full state social security available, parents tend to have more children, not so much to ensure their survival to adulthood as the mortality level is declining, but to ensure that emotional and financial support will be available from at least one child. Also, even in the urban sector, the contribution of children in the labour force is widely acknowledged (see for example, Chan, 1980).

Thus, postponement of marriage and births has affected fertility patterns such that it appears that period fertility levels are declining quite rapidly. The recent development plans have assumed the decline in fertility will continue and no allowance is made for a possible slowing down of fertility decline or even an upturn in the

period fertility levels. The use of desired family size to indicate future fertility is not very reliable. Actual fertility is found to be higher than desired fertility. For example, the Malay and Chinese birth cohorts of 1926-30, 1931-35 and 1936-40, reported an average family size desired of about 4 children in the 1974 MFFS but the Malay women ended up with about 6 children and the Chinese women with about 5 children. It is true that a large proportion of these women had no education and very few had more than 6 years of education. About 52 percent of the Malay women in the 1936-40 birth cohort had no education compared with 38 percent of the Chinese women (1970 Population Census). But it is not true that these women did not know of efficient methods of contraception; some 86 percent of the Malay women in the 1936-40 birth cohort and about 73 percent in the 1926-30 birth cohort knew of the existence of efficient methods of contraception. The proportion of Chinese women who knew of efficient methods of contraception in these two cohorts were 98 and 96 percent respectively. Yet in the 1974 MFFS, only about 5 percent of the Malay women in the 1926-30 birth cohort reported ever using efficient methods of contraception and 10 percent inefficient methods. These figures increased to 30 percent of Malay women practising efficient methods and 8 percent inefficient methods in the 1936-40 birth cohort. The completed family size was hardly reduced. For the Chinese women, there was a drop in the completed family size of about one child between the 1926-30 and the 1936-40 birth cohorts. The proportion of Chinese women practising efficient methods of contraception was 67 percent in the 1936-40 birth cohort and 35 percent in the 1926-30 birth cohort. Thus, the lack of contraceptive use is not from lack of knowledge of contraceptive methods but rather from a reluctance to use

these methods to limit their family size. There was a postponement of marriage of one year' between the 1926-30 and the 1936-40 birth cohorts but completed family size remained at about the same level, particularly for the Malay women.

Perhaps, with higher education and greater participation of women in the work force, women will be forced to use contraceptive methods and terminate their fertility at a younger age. Also it may not just be an increase in age at marriage but an increase past a certain age say, 25, that will effectively reduce the completed family size. But decline in completed fertility seems unlikely to come naturally from just higher education and work force participation if one can rely on the figure of desired family size of about 4 children of the 1950-59 birth cohort. The government has to recognise that a population problem exists and make greater efforts to educate the people to limit their family size. In the Fourth Malaysia Plan, there was no explicit recognition of the population variables nor was there any consideration of the effects of socio-economic changes on demographic behaviour (rf. Lim, 1981a, Section 5.1). Population factors should be integrated into the development plans as a possible increase in period fertility has serious implications in terms of education, employment, housing, and the general development of the country.[2]

ADDITIONAL NOTES (CHAPTER 8)

Page numbers in brackets at the end of each note refer to the relevant page in the text of the thesis.

[1] The decline in divorce has tended to push up age-specific fertility rates for the Malay women. This is observed in terms of the lesser decline in period fertility for the Malays compared with the Chinese.
Work status can have an independent as well as a joint effect with education on fertility. The joint effect or the interaction effect was found to be non-significant.
Urbanisation is not cited as a 'cause' of declining Chinese fertility but rather as a reason for the faster decline. This means that if a high proportion of Chinese live in urban areas, they will be near family planning centres, they will be more 'modern' in their attitudes, they will have more means of communication, etc.

(pp. 316-320)

[2] Age at marriage has been increasing for both the Malays and Chinese. In both cases, it undoubtedly represents an accommodation to changing economic conditions, extended periods of schooling, changing job opportunities, and increased urbanisation. For the Malays, it signifies an especially marked change in long-established norms of family life and female roles, but it is hard to know how much is due to changing economic conditions and how much to the penetration of new ideas and value systems.
As stated earlier in this chapter (p. 316), the nuptiality-fertility patterns observed for the Malays amd Chinese do not fall exactly into any one phase of the Matras-Ryder models. The Chinese, being more 'modern' are probably now at stages (b) and (c) of the strategies of Matras and Ryder. That is, the Chinese are marrying late but fertility is not fully controlled and there is no indication that marriage is becoming less universal. The Malays are not marrying as late as the Chinese and there is less practice of contraception. Their nuptiality-fertility pattern also probably falls into stages (b) and (c) of the strategies of Matras and Ryder.
It is difficult to predicat whether this model will fit the Malaysian experience and whether the Malays and Chinese are approaching a similar pattern. While age at marriage is increasing, marriage is still universal. It is, however, not unlikely that the proportion not marrying will increase in the future for reasons specified earlier. One cannot say for sure, though, how long the average age at marriage will continue increasing. The path for fertility change is also uncertain. On the one hand, social and economic changes, such as higher education and labour force participation, will tend to result in more women using contraceptive methods and having smaller family size. On the other hand, cultural factors in the case of the Malays as well as government policies are not favouring such a move.
The main purpose of the thesis is not to study nuptiality patterns or fertility patterns per se but rather the relationship between the two. The thesis has shown that the nuptiality changes and the changes in birth timing have affected period fertility such that period fertility is declining. This is giving the misleading impression that family size is being reduced, quite drastically by the Chinese. The evidence on cohort

fertility indicates that fertility decline is not as sharp as period fertility rates would suggest. In the very near future, in view of the changes in nuptiality and birth timing, and the small reduction in completed family size, period fertility is expected to rise. The indications are, using recent figures, that this is already taking place in the late 1970s and early 1980s for the Malays. (p. 326)

REFERENCES

Abdul Halim Haji Mohammed
1979 'Sikap dan Amalan Masyarakat Melayu Terhadap Perkahwinan dan Perceraian - Satu Tinjauan di Kampung Pasir, Johor Baru', Unpublished Graduation Exercise, Fakulti Ekonomi dan Pentadbiran, University of Malaya.

Agarwala, S. N.
1967 'Pattern of Marriage In Some ECAFE Countries', INTERNATIONAL POPULATION CONFERENCE, London, 1967, Proceedings, 3, IUSSP, Liege: 2106-2126.

Ahmad Ibrahim
1977 'Law and Population in Malaysia', LAW AND POPULATION MONOGRAPH SERIES, 45, The Fletcher School of Law and Diplomacy, Tufts University, Medford, Massachusetts.

Ahmad, S. W. and R. Chander
1976 'An Analytical Study of the Post-Enumeration Survey of West Malaysia 1970 - A Fertility Analysis', Mimeo., Faculty of Economics and Administration, University of Malaya.

Basavarajappa, K. G. and M. I. Belvalgidad
1967 'Changes in Age at Marriage of Females and their Effect on the Birth Rate in India', EUGENICS QUARTERLY, 14(1): 14-26.

Becker, Gary S.
1973-74 'A Theory of Marriage', JOURNAL OF POLITICAL ECONOMY, 81(4): 813-46 and 82(2): 11-26 (parts 1 and 2).

Becker, G., E. Landes and R. Michael
1976 'Economics of Marital Instability', Working Paper(153), NBER, Stanford, California.

Bernard, Jessie
1956 REMARRIAGE: A STUDY OF MARRIAGE, Henry Holt, New York.

Bernard, J.
1966 'Marital Stability and Patterns of Status Variables', JOURNAL OF MARRIAGE AND THE FAMILY, 28: 421-429.

Bernhardt, E. M.
1971 TRENDS AND VARIATIONS IN SWEDISH FERTILITY: A COHORT STUDY, Swedish Central Bureau of Statistics, Stockholm.

Blake, Judith
1965 'Parental Control, Delayed Marriage and Population Policy', U. N. WORLD POPULATION CONFERENCE, Belgrade, Yugoslavia, August 30-September 10, 1965 (Collected Papers), 2: 119-123.

Bogue, Donald J.
1969 PRINCIPLES OF DEMOGRAPHY, John Wiley and Sons, New York.

Bongaarts, J.
1978 'A Framework for Analysing Proximate Determinants of Fertility', POPULATION AND DEVELOPMENT REVIEW, 4(1): 105-132.

Bossard, James H. S.
1932 'Residential Propinquity as a Factor in Marriage Selection', AMERICAN JOURNAL OF SOCIOLOGY, 38: 219-224.

Boulier, Bryan and Mark R. Rosenzweig
1978 'Age, Biological Factors, and Socioeconomic Determinants of Fertility: A New Measure of Cumulative Fertility for Use in the Empirical Analysis of Family Size', DEMOGRAPHY, 15(4): 487-497.

Bowerman, Charles E.
1953 'Assortative Mating by Previous Marital Status: Seattle, 1939-1946', AMERICAN SOCIOLOGICAL REVIEW, 18: 170-177.

Budi Soeradji Martokoesoemo
1979 MARRIAGE AND DIVORCE IN INDONESIA - A DEMOGRAPHIC STUDY, University Microfilms, University of Chicago, Illinois.

Bumpass, Larry
1969 'Age at Marriage as a Variable in Socio-economic Differentials in Fertility', DEMOGRAPHY, 6(1): 45-54.

Bumpass, Larry
1979 'Changing Linkage of Nuptiality and Fertility in the United States', Paper presented at the IUSSP Seminar on Nuptiality and Fertility, Bruges.

Bumpass, L. and E. K. Mburugu
1977 'Age at Marriage and Completed Family Size', SOCIAL BIOLOGY, 24: 31-37.

Bumpass, L. and J. A. Sweet
1972 'Differentials in Marital Instability: 1970', AMERICAN SOCIOLOGICAL REVIEW, 37: 754-766.

Bumpass, L., R. Rindfuss and R. Janosik
1978 'Age and Marital Status at First Birth and the Pace of Subsequent Fertility', DEMOGRAPHY, 15: 75-86.

Busfield, Joan
1972 'Age at Marriage and Family Size: Social Causation and Social Selection Hypothesis', JOURNAL OF BIOMEDICAL SCIENCE, 4(1): 117-134.

Butz, W. P. and J. DaVanzo
1978 THE MALAYSIAN FAMILY LIFE SURVEY: SUMMARY REPORT, R-2351-AID, The Rand Corporation.

Caldwell, J. C.
1963 'Fertility Decline and Female Chances of Marriage in Malaya', POPULATION STUDIES, 17(1): 20-32.

Caldwell, John C.
1980 'Mass Education as a Determinant of the Timing of Fertility Decline', POPULATION AND DEVELOPMENT REVIEW, 6(2): 225-255.

Carter, H. and Glick, P. C.
1976 MARRIAGE AND DIVORCE: A SOCIAL AND ECONOMIC STUDY, Harvard University Press, Harvard, Mass.

Casterline, John B. and James Trussell
1980 'Age at First Birth', WFS COMPARATIVE STUDIES(15).

Chan, P. T. H.
1980 'The Forgotten Little People: A Study of Urban Child Labour in a Developing Economy', Paper presented at the Sixth Malaysian Economic Convention, Penang.

Chander, R., V. T. Palan, Nor Laily Aziz and Tan Boon Ann
1977 MALAYSIAN FERTILITY AND FAMILY SURVEY - 1974: FIRST COUNTRY REPORT, Department of Statistics, Kuala Lumpur, Malaysia.

Cherlin, A.
1977 'The Effect of Children on Marital Dissolution', DEMOGRAPHY, 14(3): 265-272.

Chin, S. E.
1980 'Urban Squatters in Penang', Unpublished Graduation Exercise, Faculty of Economics and Administration, University of Malaya.

Christensen, H. T.
1963 'Child Spacing via Record Linkage: New Data plus a Summing up from Earlier Reports', MARRIAGE AND FAMILY LIVING, 25: 272-280.

Cho, Lee-Jay and Kazumasa Kobayashi (eds.)
1979 FERTILITY TRANSITION OF EAST ASIAN POPULATION, The University Press of Hawaii, Honolulu.

Cho, Lee-Jay and Robert D. Retherford
1974 'Comparative Analysis of Recent Fertility Trends in East Asia', INTERNATIONAL POPULATION CONFERENCE, IUSSP, Liege, II: 163-181.

Coale, Ansley J.
1969 'The Decline of fertility in Europe from the French Revolution to World War II', in S. J. Behrman, L. Corsa and R. Freedman (eds.), FERTILITY AND FAMILY PLANNING: A WORLD VIEW, University of Michigan Press, Ann Arbor: 3-25.

Coale, Ansley J.
1971 'Age Patterns of Marriage', POPULATION STUDIES, 25(2): 193-214.

Coale, Ansley J.
1974 'The Demographic Transition Reconsidered', INTERNATIONAL POPULATION CONFERENCE, IUSSP, Liege, I: 53-72.

Coale, A. J. and Donald R. McNeil
1972 'The Distribution by Age of First Marriage in a Female Cohort', JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION, 67: 743-749.

Coale, A. J. and C. Y. Tye
1961 'The Significance of Age Patterns of Fertility in High Fertility Population', MILBANK MEMORIAL FUND QUARTERLY, 39(4): 631-646.

Coale, Ansley J., Noreen Goldman and Lee-Jay Cho
1979 'Nuptiality and Fertility in the Republic of Korea', Paper presented at the IUSSP Seminar on Nuptiality and Fertility, Bruges.

Cohen, Sarah B. and James A. Sweet
1974 'The Impact of Marital Disruption and Remarriage on Fertility', JOURNAL OF MARRIAGE AND THE FAMILY, 36(1): 87-96.

Collver, O. Andrew
1968 'Women's Work Participation and Fertility in Metropolitan Areas', DEMOGRAPHY, 5(1): 55-60.

Concepcion, Mercedes B.
1980 'Family Formation and Contraception in Selected Developing Countries: Policy Implications of WFS Findings', Paper presented at World Fertility Survey Conference in London, England (July).

Coombs L. and R. Freedman
1970 'Premarital Pregnancy, Childspacing and Later Economic Achievement', POPULATION STUDIES, 24: 389-412.

Cox, D. R.
1972 'Regression Models and Life Tables', JOURNAL OF ROYAL STATISTICAL SOCIETY, Series B, 34: 187-220.

Crockett, J.
1967 CONSUMER EXPENDITURE AND INCOMES IN GREECE, Research Monograph Series, 17, Athens.

Cutright, P.
1971 'Income and Family Events: Marital Stability', JOURNAL OF MARRIAGE AND THE FAMILY, 33(2): 291-306.

DaVanzo, J. and W. P. Butz
1981 BIRTHSPACING, FERTILITY AND FAMILY PLANNING - POLICY AND PROGRAM IMPLICATIONS FROM THE MALAYSIAN FAMILY LIFE SURVEY, R-2925-AID, The Rand Publication Series.

DaVanzo, J. and J. Haaga
1982 'Anatomy of a Fertility Decline: Peninsular Malaysia, 1950-1960', POPULATION STUDIES, 36.

Davis, Kingsley and Judith Blake
1956 'Social Structure and Fertility: An Analytic Framework',ECONOMIC DEVELOPMENT AND CULTURAL CHANGE, 4(3): 211-35.

Dixon, Ruth B.
1970 'The Social and Demographic Determinants of Marital Postponement and Celibacy: A Comparative Study', Unpublished Ph. D. thesis, University of California, Berkeley.

Dixon, Ruth
1971 'Explaining Cross-Cultural Variations in Age at Marriage and Proportions Never Marrying', POPULATION STUDIES, 25(2): 215-233.

Dixon, Ruth
1973 THE SOCIAL AND DEMOGRAPHIC DETERMINANTS OF MARITAL POSTPONEMENT AND CELIBACY: A COMPARATIVE STUDY, University Microfilms, Ann Arbor.

Djamour, Judith
1959 MALAY KINSHIP AND MARRIAGE IN SINGAPORE, London School of Economics Monographs on Social Anthropology(21), Athlone Press, London.

D'Souza, Stan
1979 'Nuptiality Patterns and Fertility Implications on South Asia', Paper presented at the IUSSP Seminar on Nuptiality and Fertility, Bruges.

Duza, Badrud M. and Baldwin, Stephen C.
1977 'Nuptiality and Population Policy', The Population Council, New York.

Easterlin, Richard
1973 'Relative Economic Status And The American Fertility Swing', in Eleanor Sheldon (ed.), FAMILY ECONOMIC BEHAVIOUR, J. B. Lippincott, Philadelphia: 170-223.

Farid, S. M.
1974 'On the Tempo of Childbearing in England and Wales', POPULATION STUDIES, 28: 69-83.

Fawcett, James T.
1974 'Psychological Determinants of Nuptiality', INTERNATIONAL POPULATION CONFERENCE, IUSSP, Liege, II: 19-30.

Ferry, Benoit
1981 'Breastfeeding', WFS COMPARATIVE STUDIES(13).

Fong, K. Y.
1973 'Some Economic Aspects of Fertility Control with Special Reference to West Malaysia', Unpublished Graduation Exercise, Faculty of Economics and Administration, University of Malaya.

Freedman, Maurice
1957 CHINESE FAMILY AND MARRIAGE IN SINGAPORE, Colonial Research Studies(20), H.M.S.O., London.

Freedman, R.
1968 'Norms for Family Size in Underdeveloped Areas', in Charles B. Nam (ed.), POPULATION AND SOCIETY, Houghton Mifflin Company, Boston: 215-230.

Freedman, R.
1979 'Theories of Fertility Decline: A Reappraisal', SOCIAL FORCES, 58(1): 1-17.

Freedman, Ronald and John Casterline
1979 'Nuptiality and Fertility in Taiwan', Paper presented at the IUSSP Seminar on Nuptiality and Fertility, Bruges.

Glick, Paul and Emmanuel Landau
1950 'Age at a Factor in Marriage', AMERICAN SOCIOLOGICAL REVIEW, 15(4): 517-529.

Glick, P. C. and A. J. Norton
1971 'Frequency, Duration, and Probability of Marriage and Divorce', JOURNAL OF MARRIAGE AND THE FAMILY, 33: 307-317.

Goldfeld, Stephen M. and Richard E. Quandt
1972 NONLINEAR METHODS IN ECONOMETRICS, North Holland, New York.

Goode, W. J.
1962 'Marital Satisfaction and Instability: A Cross-Cultural Class Analysis of Divorce Rates', INTERNATIONAL SOCIAL SCIENCE JOURNAL, 14: 507-526.

Goodman, L. A.
1970 'The Multivariate Analysis of Qualitative Data: Interactions Among Multiple Classifications', JOURNAL OF AMERICAN STATISTICAL ASSOCIATION, 65: 226-256.

Goodman, L. A.
1972 'A Modified Multiple Regression Approach to the Analysis of Dichotomous Variables', AMERICAN SOCIOLOGICAL REVIEW, 37: 28-46.

Goodman, L.
1978 ANALYZING QUALITATIVE/ CATEGORICAL DATA, Abt. Books, Abt. Associates, Cambridge, Mass.

Grunfeld and Griliches
1960 'Is Aggregation Necessarily Bad?' THE REVIEW OF ECONOMICS AND STATISTICS, 42: 1-13.

Haaga, J.
1982 THE ACCURACY OF RETROSPECTIVE LIFE HISTORY DATA FROM THE MALAYSIAN FAMILY LIFE SURVEY, N-1823-AID, The Rand Corporation.

Hajnal, J.
1965 'European Marriage Patterns in Perspective', in Glass, D. V. and Eversley, D. E. C.(eds.), POPULATION IN HISTORY, Arnold, London: 101-143.

Hawthorn, Geoffrey P.
1970 THE SOCIOLOGY OF FERTILITY, Collier-Macmillan, London.

Heer, David
1966 'Economic Development and Fertility', DEMOGRAPHY, 3(2): 423-444.

Heeren, H. J.
1974 'Marriage as a Demographic Variable', INTERNATIONAL POPULATION CONFERENCE, IUSSP, Liege, II: 9-17.

Henry, Alice and Phyllis T. Piotrow
1979 'Age at Marriage and Fertility', POPULATION REPORTS, Series M(4): 106-159.

Henry, L.
1961 'Some Data on Natural Fertility', EUGENICS QUARTERLY, 8: 81-91.

Henry, L.
1976 POPULATION, ANALYSIS AND MODELS, Edward Arnold, London.

Hirschman, C.
1980 'Demographic Trends in Peninsular Malaysia, 1947-1975', POPULATION AND DEVELOPMENT REVIEW, 6(1): 103-125.

Hirschman, C. and Dorothy Fernandez
1980 'The Decline of Fertility in Peninsular Malaysia', GENUS, 36(1-2): 93-125.

Hobcraft, John and John Casterline
1982 'Speed of Reproduction', WFS TECH. 1909.

Hobcraft, John and James Trussell
1980 'A Note on the Analysis of Maternity Histories by Birth Order', WFS TECH. 1305.

Hoffman, S. and J. Holmes
1976 'Husbands, Wives, and Divorce', in G. J. Duncan and J. N. Morgan (eds.), FIVE THOUSAND FAMILIES: PATTERNS OF ECONOMIC PROGRESS, 4, Institute for Social Research, University of Michigan, Ann Arbor: 23-75.

Holford, T. R.
1980 'The Analysis of Rates and of Survivorship Using Log-linear Models', BIOMETRICS, 36: 299-305.

Hull, Terence H. and Valerie J. Hull
1976 'The Relation of Economic Class and Fertility: An Analysis of Some Indonesian Data', POPULATION STUDIES, 31(1): 43-57.

Jacobson, P. W.
1950 'Differentials in Divorce by Duration of Marriage and Size of Family', AMERICAN SOCIOLOGICAL REVIEW, 15: 237-249.

Jones, G. W.
1978 SOCIAL SCIENCE RESEARCH AND POPULATION AND DEVELOPMENT IN SOUTH-EAST AND EAST ASIA, International Review Group of Social Science Researh on Population and Development, Appendix 3, Mexico City.

Jones, G. W.
1979 'Population Growth and Fertility Change in Peninsular Malaysia Since 1957', Mimeo.

Jones, G. W.
1980 'Trends in Marriage and Divorce in Peninsular Malaysia', POPULATION STUDIES, 34(2): 279-292.

Jones, G. W.
1981 'Malay Marriage and Divorce in Peninsular Malaysia: Three Decades of Change', POPULATION AND DEVELOPMENT REVIEW, 7(2): 255-278.

Jones, G. W. and M. S. Sidhu
1981a 'Population Growth in Peninsular Malaysia', in M. S. Sidhu and G. W. Jones, POPULATION DYNAMICS IN A PLURAL SOCIETY: PENINSULAR MALAYSIA, UMCB Publications, Malaysia: 29-62.

Jones, G. W. and Manjit S. Sidhu
1981b 'Literacy and Educational Attainment' in M. S. Sidhu and G. W. Jones, POPULATION DYNAMICS IN A PLURAL SOCIETY: PENINSULAR MALAYSIA, UMCB Publications, Malaysia: 209-232.

Kalfleisch, J. D. and Ross L. Prentice
1980 THE STATISTICAL ANALYSIS OF FAILURE TIME DATA, John Wiley and Sons, New York.

Kaur, J. B.
1979 'Marriage, Marriage Dissolution and Fertility Among Chinese - Case Study of Chinese in Palm Grove, Kelang, Selangor', Unpublished Grad. Ex., Faculty of Economics and Administration, University of Malaya.

Kay, R.
1977 'Proportional Hazard Regression Models and the Analysis of Censored Survival Data', APPLIED STATISTICS, 26: 227-237.

Kee P. K.
1980 'Fertility Values in Peninsular Malaysia', Unpublished Ph. D. thesis, Australian National University.

Knodel, John and Etienne van de Walle
1979 'Lessons from the Past: Policy Implications of Historical Fertility Studies', POPULATION AND DEVELOPMENT REVIEW, 5(2): 217-245.

Kuchiba, Masuo, Yoshihiro Tsubouchi and Narifumi Maeda (eds.)
1979 THREE MALAY VILLAGES: A SOCIOLOGY OF PADDY GROWERS IN WEST MALAYSIA, translated by Peter and Stephanie Hawkes, The University Press of Hawaii, Honolulu.

Kuo, Eddie C. Y. and Riaz Hassan
1979 'Ethnic Intermarriage in a Multiethnic Society', in Kuo and Wong (1979): 168-188.

Kuo, Eddie C. Y. and Aline K. Wong
1979 THE CONTEMPORARY FAMILY IN SINGAPORE, Singapore University Press, Singapore.

Lee, K. H.
1981 'Determinants of Age at First Marriage - Development Linkages Re-examined', Mimeo., Faculty of Economics and Administration, University of Malaya.

Leridon, H.
1969 'Some Comments on the Article by Srinivasan: A Probability Model Applicable to the Study of Inter-live Birth Intervals and Random Segments of the Same', POPULATION STUDIES, 23: 101-4.

Lesthaeghe, R.
1971 'Nuptiality and Population Growth', POPULATION STUDIES, 25(3): 415-432.

Lim Lin Lean
1974 'The Pattern of Income Distribution in West Malaysia, 1957-70', Working Paper for the World Employment Programme Research, I.L.O., Geneva.

Lim Lin Lean
1981a POPULATION AND DEVELOPMENT STATUS REPORT FOR WEST MALAYSIA, Asean /Australia Population Project on Population and Development Dynamics and the Man/ Resource Balance, Faculty of Economics and Administration, University of Malaya.

Lim Lin Lean
1981b 'Migration Process and Socio-Economic Characteristics of the HAWA Girls', Mimeo., Faculty of Economics and Administration, University of Malaya.

Little, Roderick J. A.
1978 'Generalised Linear Models for Cross-Classified Data from the WFS', WFS TECH. 834.

Masitah Mohd. Yatim
1982 'Evaluation of the Malaysian Fertility and Family Survey, 1974', WFS SCIENTIFIC REPORTS(27).

Mason, K.
1978 'Female Employment and Fertility in Peninsular Malaysia Preliminary Results from MFFS 1974', Paper presented at the Annual Convention of American Sociological Association.

Matras, Judah
1965 'The Social Strategy of Family Formation: Some Variations in Time and Space', DEMOGRAPHY, 2: 349-62.

Maznah bte Hj. Haron
1975 'Muslim Marriage and Divorce in the Federal Territory', Unpublished Project Paper, Faculty of Law, University of Malaya.

McDonald, P. F.
1981 'Social Change and Age at Marriage', Seminar Paper, Dept. of Demography, A.N.U.

McDonald, Peter
forthcoming 'Social Organisation and Nuptiality in Developing Societies', in John Cleland and John Hobcraft (eds.), THE DEMOGRAPHY OF DEVELOPING COUNTRIES, Oxford University Press.

McDonald, Peter F., Lado T. Ruzicka and J. C. Caldwell
1980 'Interrelationships Between Nuptiality and Fertility: The Evidence from the World Fertility Survey', Paper presented at World Fertility Survey Conference, London.

Menken, J., J. Trussell, O. Babakol and D. Stempel
1981 'Proportional Hazards Life Table Models: An Illustrative Analysis of Socio-Demographic Influences on Marriage Dissolution in the United States', DEMOGRAPHY, 18(2): 181-200.

Mitchell, G. Duncan
1975 A DICTIONARY OF SOCIOLOGY, Routledge and Kegan Paul, London.

Mitchell, Robert E.
1971 'Changes in Fertility Rates and Family Size in Response to Changes in Age at Marriage, and the Trend Away from Arranged Marriages, and Increasing Urbanisation', POPULATION STUDIES, 25(3): 481-489.

Mohd. Din bin Ali
n.d.(a) 'Two Forces in Malay Society', INTISARI, I(3): 15-28.

Mohd. Din bin Ali
n.d.(b) 'Malay Customary Law/ Family', INTISARI, II(2): 33-45.

Monahan, T. P.
1955 'Is Childlessness Related to Family Stability?' AMERICAN SOCIOLOGICAL REVIEW, 20: 446-456.

Mustafar Che Mat
1980 'Beberapa Aspek Perkahwinan dan Perceraian di Kampung Pengkalan Kubor, Tumpat, Kelantan', Unpublished Rencana Latihan, Fak. Ekonomi dan Pentadbiran, Universiti Malaya, Kuala Lumpur.

Narayanan, S.
1975 'Urban In-migration and Urban Labour Absorption: A Study of Metropolitan Urban Selangor', Unpublished M. Ec. thesis, Faculty of Economics and Administration, University of Malaya.

Nimkoff, M. F.
1934 THE FAMILY, Houghton-Mifflin Company, Boston.

Notestein, Frank W.
1931 'Differential Age at Marriage According to Social Class', AMERICAN JOURNAL OF SOCIOLOGY, 38(1): 398-408.

Palan, V. T.
1979 'Community and Environmental Effects on Fertility', in National Family Planning Board, PROCEEDINGS OF THE SEMINAR ON MALAYSIAN FERTILITY AND FAMILY SURVEY/ POPULATION AND DEVELOPMENT, Kuala Lumpur.

Palmore, J. and Ariffin bin Marzuki
1969 'Marriage Patterns and Cumulative Fertility in West Malaysia, 1966-67', DEMOGRAPHY, 6(4): 383-401.

Pirie, P.
1976 'Squatter Settlements in Kuala Lumpur', Paper presented at the Third Malaysian Economic Convention, Penang.

Png, Poh-Seng
1969 'The Straits Chinese in Singapore: A Case of Local Identity and Socio-Cultural Accomodation', JOURNAL OF SOUTHEAST ASIAN HISTORY, 10: 96-115.

Presser, H. B.
1971 'The Timing of the First Birth, Female Roles, and Black Fertility', MILBANK MEMORIAL FUND QUARTERLY, 49: 329-362.

Pryor, R. J.
1979 'Malaysia: A Demographic Analysia of Internal Migrants', in Pryor, R. J. (ed.), MIGRATION AND DEVELOPMENT IN SOUTH-EAST ASIA - A DEMOGRAPHIC PERSPECTIVE, Oxford University Press, Kuala Lumpur.

Rindfuss, Ronald R., James A. Palmore and Larry L. Bumpass
1982 'Selectivity and the Analysis of Birth Intervals from Survey Data', ASIAN AND PACIFIC CENSUS FORUM, 8(3): 5-16.

Rodriguez, German and John N. Hobcraft
1980 'Illustrative Analysis: Life Table Analysis of Birth Intervals in Colombia', WFS SCIENTIFIC REPORTS(16).

Rodriguez, German and James Trussell
1980 'Maximum Likelihood Estimation of the Parameters of Coale's Model Nuptiality Schedule from Survey Data', WFS TECHNICAL BULLETIN(7).

Ruzicka, L. T.
1976 'Age at Marriage and Timing of the First Birth', POPULATION STUDIES, 30: 527-538.

Ryder, N. B.
1964 'The Process of Demographic Translation', DEMOGRAPHY, 1(1): 74-82.

Ryder, N. B.
1967 'The Character of Modern Fertility', ANNALS OF THE AMERICAN ACADEMY OF POLITICAL SCIENCE, 369(January): 1-140.

Ryder, N. B.
1980 'Component of Temporal Variations in American Fertility', in R. W. Hiorns (ed.), DEMOGRAPHIC PATTERNS IN DEVELOPED SOCIETIES, (Symposia of the Society for the Study of Human Biology, 19), Taylor and Francis, London.

Ryder, N. B.
1981 'Cohort and Period Orientations to Measurement of Marital Formation and Dissolution', INTERNATIONAL POPULATION CONFERENCE, IUSSP, Manila: 467-483.

Sandhu, Kernal S.
1964 'Emergency Resettlement in Malaya', JOURNAL OF TROPICAL GEOGRAPHY, 18: 155-183.

Schultz, T. W. (ed.)
1974 ECONOMICS OF THE FAMILY: MARRIAGE, CHILDREN AND HUMAN CAPITAL, University of Chicago Press, Chicago.

See, C. M.
1979 'Trends and Differentials of Chinese Marriages in a New Village', Unpublished Grad. Ex., Faculty of Arts and Social Sciences, University of Malaya.

Sidhu, M. S. and G. W. Jones
1981 'Population Distribution in Peninsular Malaysia: Historical Trends and Contemporary Issues', in Sidhu and Jones, POPULATION DYNAMICS IN A PLURAL SOCIETY: PENINSULAR MALAYSIA, UMCB Publications, Kuala Lumpur, Malaysia.

Sinha, J. N.
1954 'Fertility and Age at Marriage', BULLETIN OF THE INTERNATIONAL STATISTICAL INSTITUTE, 33: 113-126.

Sklar, June
1971 'Marriage Regulation and the California Birth Rate', in Kingsley Davis and Frederick G. Styles (eds.), CALIFORNIA'S TWENTY MILLION, University of California, Berkeley: 165-197.

Smith, David P.
1980 'Life Table Analysis', WFS TECH. 1365(6).

Smith, Peter C.
1975 'Changing Patterns of Nuptiality', in W. Flieger and P. C. Smith (eds.), A DEMOGRAPHIC PATH TO MODERNITY, The University of the Philippines Press, Quezon City: 41-82.

Smith, Peter C.
1976 'Asian Nuptiality in Transition', Paper presented at the 7th Summer Seminar in Population, East-West Population Institute, Honolulu.

Smith, T. E.
1952 POPULATION GROWTH IN MALAYA: AN ANALYSIS OF RECENT TRENDS, London Royal Institute of International Affairs.

Sonquist, J. A.
1975 MULTIVARIATE MODEL BUILDING: THE VALIDATION OF A SEARCH STRATEGY, Survey Research Center, University of Michigan, Ann Arbor, Chap. 5-6.

Sonquist, John A., E. L. Baker and J. N. Morgan
1974 SEARCHING FOR STRUCTURE, Survey Research Center, University of Michigan, Ann Arbor.

Srinivasan, K.
1967 'A Probability Model Applicable to the Study of Inter-live Birth Intervals and Random Segments of the Same', POPULATION STUDIES, 21: 63-70.

Stone, Lawrence
1977 THE FAMILY, SEX AND MARRIAGE IN ENGLAND 1500-1800, Wiedenfeld and Nicolson, London.

Strange, Heather
1976 'Continuity and Change: Patterns of Mate Selection and Marriage Ritual in a Malay Village', JOURNAL OF MARRIAGE AND THE FAMILY, 38: 561-571.

Sweet, James A.
1977 'Demography and the Family', in Alex Inkeles, J. Coleman and Neil Smelser (eds.), ANNUAL REVIEW OF SOCIOLOGY, 3, Annual Review Inc., Palo Alto: 363-405.

Swift, M.
1963 'Men and Women in Malay Society', in Barbara E. Ward (ed.), WOMEN IN THE NEW ASIA, UNESCO.

Taeuber, Irene B.
1965 'Policies, Programmes and the Decline of Birth Rates: China and the Chinese Population of East Asia', in N. Muramatsu and P. A. Harper (eds.), POPULATION DYNAMICS, Johns Hopkins Press, Baltimore: 99-104.

Tan, Boon Ann
1981 'Fertility Differentials in Peninsular Malaysia: The Ethnic Factor', Unpublished Ph. D. thesis, University of Michigan.

Tan, P. C.
1978 'A Study of Consumption Patterns for West Malaysia, 1955-1980', Unpublished M. Ec. Thesis, University of Malaya, Kuala Lumpur.

Tan, P. C.
1981a 'Family Type, Marital Status and Birth Spacing in Peninsular Malaysia', Mimeo., Faculty of Economics and Administration, University of Malaya.

Tan, P. C.
1981b 'Determinants of Fertility Patterns in Peninsular Malaysia: Some Evidence From Cross-Tabulated Data and Raw Data', Mimeo., Faculty of Economics and Administration, University of Malaya.

Tan, P. C. and Siti Rohani Yahaya
1981 'Family Events and Marital Stability in Peninsular Malaysia', Mimeo., Faculty of Economics and Administration, University of Malaya.

Tham, A. F.
1977 'A Survey of the Demographic Structure and Socio-economic Conditions of a New Village - Kuala Kuang, Chemor, Perak', Unpublished Graduation Exercise, Faculty of Economics and Administration, University of Malaya.

Trussell, T. J. and J. Menken
1978 'Early Childbearing and Subsequent Fertility', FAMILY PLANNING PERSPECTIVES, 10: 209-218.

Trussell, James, Jane Menken and Ansley J. Coale
1979 'A General Model for Analysing the Effect of Nuptiality on Fertility', Paper presented at the IUSSP Conference on Nuptiality and Fertility, Bruges.

Trussell, James, Linda G. Martin, Robert Feldman, James A. Palmore, Mercedes Concepcion, Nor Laily Dato' Abu Bakar
1983 'Determinants of Birth Interval Length in the Philippines, Malaysia and Indonesia: A Hazard Model Analysis', Mimeo.

Udry, J. R.
1966 'Marital Instability by Race, Sex, Education and Occupation Using 1960 Census Data', AMERICAN JOURNAL OF SOCIOLOGY, 72: 203-209.

United Nations
Various issues DEMOGRAPHIC YEARBOOK, New York.

Von Elm, Barbara and Charles Hirschman
1979 'Age at First Marriage in Peninsular Malaysia', JOURNAL OF MARRIAGE AND THE FAMILY, 41(Nov.): 877-891.

Wold, H. and Lars Jureen
1953 DEMAND ANALYSIS, John Wiley and Sons, Inc., New York.

Wong Hong Kee and Ee Tiang Hong
1975 EDUCATION IN MALAYSIA, Heinemann Educational Books (Asia) Ltd., Kuala Lumpur (Second Edition).

WFS TECH. 1434
1980 'Malaysia Standard Recode File Data Documentation', International Statistical Institute, World Fertility Survey.

Yaukey, David
1973 MARRIAGE REDUCTION AND FERTILITY, Lexington Books, Mass.

Yeh, Hwa-Kuo
1969 'Chinese Marriage Patterns in Singapore', Unpublished Ph. D. thesis, New York University, University Microfilms, Ann Arbor.

Yusof, Z. A. and K. Yusof
1974 SOME SOCIO-ECONOMIC AND MEDICAL ASPECTS OF MALAY MORTALITY IN URBAN AND RURAL AREAS, Malaysian Centre for Development Studies, Prime Minister's Department, Kuala Lumpur.

Zalaludin Abdullah
1980 'Perkahwinan dan Perceraian (di Kampung Belukar, Kelantan)', Unpublished Latihan Ilmiah, S. M. Ekonomi, Universiti Malaya.

OFFICIAL PUBLICATIONS

MALAYSIA PLANS

Economic Planning Unit
1976 THIRD MALAYSIA PLAN, 1976-1980.

Malaysia
1981 FOURTH MALAYSIA PLAN, 1981-1985.

CENSUSES:

Malaya
1949 A REPORT ON THE 1947 CENSUS OF POPULATION by M. V. Del Tufo, Crown Agents for the Colonies, London.

Department of Statistics
1960 1957 POPULATION CENSUS OF THE FEDERATION OF MALAYA, Report No. 14, by H. Fell, Kuala Lumpur.

Department of Statistics
1977 1970 POPULATION CENSUS OF MALAYSIA: GENERAL REPORT, Two volumes by R. Chander, Kuala Lumpur.

Department of Statistics
1983 1980 POPULATION AND HOUSING CENSUS OF MALAYSIA: GENERAL REPORT OF THE POPULATION CENSUS, Vol. 1, edited by Khoo Teik Huat.

SURVEYS:

National Family Planning Board
(n.d.) REPORT ON THE WEST MALAYSIAN FAMILY SURVEY 1966-67.

Chander, R., V. T. Palan, N. L. Aziz and B. A. Tan
1977 MALAYSIAN FERTILITY AND FAMILY SURVEY - 1974, Department of Statistics, Malaysia.

VITAL STATISTICS

Department of Statistics
Vital Statistics West Malaysia, Various Issues.

Malaysia
Report of the Registrar-General on Population, Births, Deaths, Marriages and Adoptions, Various Issues.

Department of Statistics
Monthly Statistical Bulletin, Various issues.

ADDITIONAL REFERENCES

Kuznets, S.
1955 'Economic Growth and Income Equality', AMERICAN ECONOMIC REVIEW, 45: 1-28.

Oshima, H. T.
1975 'Perspectives in Income Distribution Research', INCOME DISTRIBUTION, EMPLOYMENT AND ECONOMIC DEVELOPMENT, 1, Papers and Proceedings of the Seminar sponsored jointly by JERC and CAMS, Dec. 16-20, 1974: 6-41.

Palmore, J.A., Robert E. Klein and Ariffin Marzuki
1970 'Class and Family in a Modernizing Society', AMERICAN JOURNAL OF SOCIOLOGY, 76: 375 - 398.

Rindfuss, Ronald R. and S. Philip Morgan
1983 'Marriage, Sex, and the First Birth Interval', POPULATION AND DEVELOPMENT REVIEW, 9(2):259 - 278.

Zainudin Salleh and Zulkifly Osman
1982 'The Economic Structure' in E.K. Fisk and H. Osman-Rani (eds.), THE POLITICAL ECONOMY OF MALAYSIA, Oxford University Press, Kuala Lumpur.

GLOSSARY

adat	Custom.
Adat Perpatih	A type of custom which originated from Mingangkabau and is practised by the Muslims residing mainly in Negri Sembilan and certain areas of Malacca such as Naning and Alor Gajah.
Adat Temenggung	A type of custom which is said to have originated from Palembang, South Sumatra, Indonesia, and is practised in other areas, which do not follow the Adat Perpatih, especially Perlis, Kedah, Perak, Selangor, Johore, Kelantan and Trengganu.
AID3 or AID	Automatic Interaction Detector or Searching for Structure.
bersanding	Part of the Malay customary marriage ceremonies of a girl's first marriage where the young couple are placed on an elaborate dais for all visitors to see.
CEB	Children ever born.
cerai taalik	A Muslim divorce resulting from the breaking of the condition that a husband has agreed and attested to on the solemnisation of marriage.
CPI	Consumer price index.
DFP test	Davidon-Fletcher Powell test.
DRAT	A measure of cumulative fertility suggested by Boulier and Rosenzweig (1978).
edah	Approximately 100 days or three months of menstrual periods after a talak divorce during which the divorce can be revoked and the divorced Muslim woman is forbidden to marry.
exp	Exponential.
fasah divorce	Divorce by judicial decree, usually petitioned by the wife.
FELDA	Federal Land Development Authority.
FERTRATE	Fertility Rate Program - a computer package of World Fertility Survey, London.
GDP	Gross Domestic Product.

ge	Greater than or equal to.
GLIM	A fortran program using interactive weighted least squares, distributed by Numerical Algorithms Group, 13 Banbury Road, Oxford OX2 6NN, U. K.
GRADX	Goldfeld and Quandt, 1972.
gt	Greater than.
hukum Islam or hukum syarak	Laws of Islam.
janda	A woman whose marriage has been terminated or annulled.
kathi	The religious official in charge of Islamic affairs in the district. The kathi besar or chief kathi is the religious official in charge of Islamic affairs in the state.
kholo' or cerai tebus talak	A divorce by compensation of the wife to the husband in return for marital release.
lt	Less than.
MCA	Multiple Classification Analysis.
M$	Malaysian dollar.
mas-kahwin or mahr	Malay marriage payment.
MFFS	Malaysian Fertility and Family Survey (1974).
MFLS	1976-77 Malaysian Family Life Survey.
MFS	West Malaysian Family Survey (1966-67).
MLE	Maximum likelihood estimator.
muhallil or china-buta	A man who marries a woman who has been divorced by three talak, and then divorces her so that she can remarry the man who talak her three times.
N	Number of cases.
n.a.	Not available.
n.d.	Not dated.
NFPB	National Family Planning Board.

No.	Number.
NUPTIAL	A computer package to estimate the parameters of the Coale-McNeil Age at Marriage Model written by Rodriguez and Trussell.
rujuk	Revocation of the talak divorce.
SES	Socio-economic status.
Shafii	Name of a school of Muslim thought.
Shariah court	Muslim judicial court.
SPSS	Statistical Package for Social Sciences.
surat cerai	Certificate of divorce.
surat taalik	The last part of the marriage certificate that contains the condition that a Muslim husband has agreed and attested to on the solemnisation of marriage.
taalik	The condition that a Muslim husband has agreed and attested to on the solemnisation of marriage. The usual condition is that a wife has the right to seek for a divorce if the husband fails to maintain her for a period of 3 to 4 months or if he absents himself for 6 months on land or a year at sea without sending any letter or money to the wife.
talak divorce	A divorce which takes place by means of a Muslim husband (sane and not intoxicated) informing his wife, either orally or in writing, of his intention to divorce her.
tba	Traditional birth attendant.
wali	Guardian (the girl's father or his representative, but if he is dead the nearest patrilineal relative) who gives the consent for marriage.
wali hakim	Guardian for the purpose of marriage.
wali raja	If a woman has no wali or her wali has unreasonably refused consent for marriage, a wali raja is appointed. The wali raja may be in the person of the kathi besar, the kathi or the registrar.
WFS	World Fertility Survey.